# Round 1 – Aff v Liberty EF

## 1ac

### 1AC Plan – with S-PRISM

#### The United States federal government should substantially increase loan guarantees for integral fast reactors using the S-PRISM design.

### Nuclear Leadership

#### Nuclear power is inevitable – Inaction on IFRs is killing US nuclear leadership

**Shuster 11** [Joseph Shuster, founder of Minnesota Valley Engineering and Chemical Engineer, 9-8-2011, "Response to Draft Report From Obama’s Blue Ribbon Commission (BRC) on America’s Nuclear Future dated July 29, 2011," Beyond Fossil Fools]

Contrary to the commission’s declarations on the matter, the U.S. is in danger of losing its once ¶ strong nuclear leadership. As a result we would have less to say about how nuclear materials are ¶ to be managed in the world and that could expose the U.S. to some inconvenient if not downright ¶ dangerous consequences. China is now building a large pilot plant said to be identical to our ¶ successful EBR-II plant that proved the design of the IFR. Meanwhile in the U.S. after complete ¶ success, EBR II was shut down, not for technical reasons but for political reasons during the ¶ Clinton administration, a decision destined to be one of the worst in our nation’s history.¶ Much of the world is already committed to a nuclear future with some countries eagerly waiting ¶ to license the American version of Generation IV Fast Reactors—the IFR. We still have the best ¶ IFR technology in the world but have squandered much of our lead, partly by allowing a largely ¶ unqualified commission two years of useless deliberation. What we really did was give our ¶ competitors an additional two years to catch up.

#### IFR restores leadership on nuclear issues – key to contain proliferation

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "IFR FaD context – the need for U.S. implementation of the IFR," 2/18/10) http://bravenewclimate.com/2010/02/18/ifr-fad-context/-http://bravenewclimate.com/2010/02/18/ifr-fad-context/

ON THE NEED FOR U.S. IMPLEMENTATION OF THE INTEGRAL FAST REACTOR¶ The IFR ties into a very big picture — international stability, prevention of war, and avoiding “proliferation” (spread) of nuclear weapons.¶ – The need for energy is the basis of many wars, including the ones we are engaged in right now (Iraq and Afghanistan). If every nation had enough energy to give its people a decent standard of living, that reason for conflict would disappear.¶ – The only sustainable energy source that can provide the bulk of the energy needed is nuclear power.¶ – The current need is for more thermal reactors — the kind we now use.¶ – But for the longer term, to provide the growing amount of energy that will be needed to maintain civilization, the only proven way available today is with fast-reactor technology.¶ – The most promising fast-reactor type is the IFR – metal-fueled, sodium-cooled, with pyroprocessing to recycle its fuel.¶ – Nobody knows yet how much IFR plants would cost to build and operate. Without the commercial-scale demo of the IFR, along with rationalization of the licensing process, any claims about costs are simply hand-waving guesses.¶ \* \* \* \*¶ Background info on proliferation (of nuclear weapons). Please follow the reasoning carefully.¶ – Atomic bombs can be made with highly enriched uranium (90% U-235) or with good-quality plutonium (bomb designers want plutonium that is ~93% Pu-239).¶ – For fuel for an LWR, the uranium only has to be enriched to 3 or 4% U-235.¶ – To make a uranium bomb you don’t need a reactor — but you do need access to an enrichment facility or some other source of highly enriched uranium…¶ – Any kind of nuclear reactor can be used to make weapons-quality plutonium from uranium-238, but the uranium has to have been irradiated for only a very short period. In other words, nobody would try to make a plutonium weapon from ordinary spent fuel, because there are easier ways to get plutonium of much better quality.¶ – Plutonium for a weapon not only has to have good isotopic quality, it also has to be chemically uncontaminated. Thus the lightly irradiated fuel has to be processed to extract the plutonium in a chemically pure form. But mere possession of a reactor is not sufficient for a weapons capability — a facility using a chemical process called PUREX is also needed.¶ – Regardless of how many reactors a country has, it cannot have a weapons capability unless it has either the ability to enrich uranium or to do PUREX-type fuel reprocessing.¶ – Therefore, the spread of weapons capability will be strongly inhibited if the only enrichment and reprocessing facilities are in countries that already have a nuclear arsenal.¶ – But that can only happen if countries with reactors (and soon that will be most of the nations of the world) have absolutely ironclad guarantees that they can get the fuel they need even if they can’t make their own, regardless of how obnoxious their political actions might be.¶ – Such guarantees will have to be backed up by some sort of international arrangement, and that can only come to pass if there is effective leadership for the laborious international negotiations that will have to take place. (For a relevant discussion, see here)¶ – At present, the only nation that has a realistic potential to be such a leader is the United States.¶ – But a country cannot be such a leader in the political arena unless it is also in the technological forefront.¶ – The United States used to be the reactor-technology leader, but it abandoned that role in 1994 when it terminated the development of the IFR.¶ – Since then, other nations — China, India, Japan, South Korea, Russia, France — have proceeded to work on their own fast-reactor versions, which necessarily will involve instituting a fuel-processing capability.¶ – Thus the United States is being left behind, and is rapidly losing its ability to help assure that the global evolution of the technology of nuclear energy proceeds in a safe and orderly manner.¶ – But maybe it’s not too late yet. After all, the IFR is the fast-reactor technology with the post promise (for a variety of reasons), and is ready for a commercial-scale demonstration to settle some uncertainties about how to scale up the pyroprocess as needed, to establish better limits on the expected cost of production units, and to develop an appropriate, expeditious licensing process.¶ – Such a demo will require federal seed money. It’s time to get moving.

#### Several impacts – 1st prolif

#### Transition to IFRs create a global proliferation resistant fuel cycle

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "Q%26A on Integral Fast Reactors – safe, abundant, non-polluting power," 9/18/10) [http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http://bravenewclimate.com/2010/09/18/ifr-fad-7/](http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http%3A//bravenewclimate.com/2010/09/18/ifr-fad-7/)

Thermal reactors with reprocessing would do at least a little better.¶ Recycling (it would be with the PUREX process, or an equivalent) could stretch the U-235 supply another few decades—but remember the consequences: growing stockpiles of plutonium, pure plutonium streams in the PUREX plants, and the creation of 100,000-year plutonium mines.¶ If you’re going to talk about “PUREX” and “plutonium mines” you should say what they are. First, what’s PUREX?¶ It’s a chemical process developed for the nuclear weapons program, to separate plutonium from everything else that comes out of a reactor. Weapons require very pure plutonium, and that’s what PUREX delivers. The pyroprocess used in the IFR is very different. It not only does not, it cannot, produce plutonium with the chemical purity needed for weapons.¶ Why do you keep referring to “chemical” purity?¶ Because chemical and isotopic quality are two different things. Plutonium for a weapon has to be pure chemically. Weapons designers also want good isotopic quality—that is, they want at least 93% of their plutonium to consist of the isotope Pu- 239. A chemical process does not separate isotopes.¶ I see. Now, what about the “plutonium mines?”¶ When spent fuel or vitrified reprocessing waste from thermal reactors is buried, the result is a concentrated geological deposit of plutonium. As its radioactivity decays, those deposits are sources of raw material for weapons, becoming increasingly attractive over the next 100,000 years and more (the half-life of Pu-239 being 24,000 years).¶ You listed, back at the beginning, some problems that the IFR would ameliorate. A lot of those problems are obviously related to proliferation of nuclear weapons.¶ Definitely. For instance, although thermal reactors consume more fuel than they produce, and thus are not called “breeders,” they inescapably are prolific breeders of plutonium, as I said. And that poses serious concerns about nuclear proliferation. And proliferation concerns are even greater when fuel from thermal reactors is recycled, since the PUREX method is used. IFRs have neither of those drawbacks.¶ Why does it seem that there is more proliferation-related concern about plutonium than about uranium? Can’t you make bombs from either?¶ Yes. The best isotopes for nuclear explosives are U-235, Pu- 239, and U-233. Only the first two of those, however, have been widely used. All the other actinide isotopes, if present in appreciable quantity, in one way or another complicate the design and construction of bombs and degrade their performance. Adequate isotopic purity is therefore important, and isotopic separation is much more difficult than chemical separation. Even so, with plutonium of almost any isotopic composition it is technically possible to make an explosive (although designers of military weapons demand plutonium that is at least 93% Pu-239), whereas if U-235 is sufficiently diluted with U-238 (which is easy to do and hard to undo), the mixture cannot be used for a bomb.¶ High-quality plutonium is the material of choice for a large and sophisticated nuclear arsenal, while highly enriched uranium would be one of the easier routes to a few crude nuclear explosives.¶ So why the emphasis on plutonium?¶ You’re asking me to read people’s minds, and I’m not good at that. Both uranium and plutonium are of proliferation concern.¶ Where is the best place for plutonium?¶ Where better than in a reactor plant—particularly an IFR facility, where there is never pure plutonium (except some, briefly, when it comes in from dismantled weapons), where the radioactivity levels are lethal, and where the operations are done remotely under an inert, smothering atmosphere? Once enough IFRs are deployed, there never will need to be plutonium outside a reactor plant—except for the then diminishing supply of plutonium left over from decades of thermal-reactor operation.¶ How does the IFR square with U.S. policy of discouraging plutonium production, reprocessing and use?¶ It is entirely consistent with the intent of that policy—to render plutonium as inaccessible for weapons use as possible. The wording of the policy, however, is now obsolete.¶ How so?¶ It was formulated before the IFR’s pyroprocessing and electrorefining technology was known—when “reprocessing” was synonymous with PUREX, which creates plutonium of the chemical purity needed for weapons. Since now there is a fuel cycle that promises to provide far-superior management of plutonium, the policy has been overtaken by events.¶ Why is the IFR better than PUREX? Doesn’t “recycling” mean separation of plutonium, regardless of the method?¶ No, not in the IFR—and that misunderstanding accounts for some of the opposition. The IFR’s pyroprocessing and electrorefining method is not capable of making plutonium that is pure enough for weapons. If a proliferator were to start with IFR material, he or she would have to employ an extra chemical separation step.¶ But there is plutonium in IFRs, along with other fissionable isotopes. Seems to me that a proliferator could take some of that and make a bomb.¶ Some people do say that, but they’re wrong, according to expert bomb designers at Livermore National Laboratory. They looked at the problem in detail, and concluded that plutonium-bearing material taken from anywhere in the IFR cycle was so ornery, because of inherent heat, radioactivity and spontaneous neutrons, that making a bomb with it without chemical separation of the plutonium would be essentially impossible—far, far harder than using today’s reactor-grade plutonium.¶ So? Why wouldn’t they use chemical separation?¶ First of all, they would need a PUREX-type plant—something that does not exist in the IFR cycle.¶ Second, the input material is so fiendishly radioactive that the processing facility would have to be more elaborate than any PUREX plant now in existence. The operations would have to be done entirely by remote control, behind heavy shielding, or the operators would die before getting the job done. The installation would cost millions, and would be very hard to conceal.¶ Third, a routine safeguards regime would readily spot any such modification to an IFR plant, or diversion of highly radioactive material beyond the plant.¶ Fourth, of all the ways there are to get plutonium—of any isotopic quality—this is probably the all-time, hands-down hardest.¶ The Long Term¶ Does the plutonium now existing and being produced by thermal reactors raise any proliferation concerns for the long term?¶ It certainly does. As I said earlier, burying the spent fuel from today’s thermal reactors creates geological deposits of plutonium whose desirability for weapons use is continually improving. Some 30 countries now have thermal-reactor programs, and the number will grow. To conceive of that many custodial programs being maintained effectively for that long is a challenge to the imagination. Since the IFR can consume plutonium, it can completely eliminate this long-term concern.¶ Are there other waste-disposal problems that could be lessened?¶ Yes. Some constituents of the waste from thermal reactors remain appreciably radioactive for thousands of years, leading to 10,000-year stability criteria for disposal sites. Waste disposal would be simpler if that time frame could be shortened. With IFR waste, the time of concern is less than 500 years.¶ What about a 1994 report by the National Academy of Sciences? The Washington Post said that the NAS report “denounces the idea of building new reactors to consume plutonium.”¶ That characterization of the report is a little strong, but it is true that the members of the NAS committee seem not to have been familiar with the plutonium-management potential of the IFR. They did, however, recognize the “plutonium mine” problem. They say (Executive Summary, p.3):¶ Because plutonium in spent fuel or glass logs incorporating high-level wastes still entails a risk of weapons use, and because the barrier to such use diminishes with time as the radioactivity decays, consideration of further steps to reduce the long-term proliferation risks of such materials is required, regardless of what option is chosen for [near-term] disposition of weapons plutonium. This global effort should include continued consideration of more proliferation-resistant nuclear fuel cycles, including concepts that might offer a long-term option for nearly complete elimination of the world’s plutonium stocks. The IFR, obviously, is just such a fuel cycle—a prime candidate for “continued consideration.”

#### We’re on the brink of rapid prolif – access to tech is inevitable and multilateral institutions fail

**CFR 12** [CFR 7-5-2012, "The Global Nuclear Nonproliferation Regime," Council on Foreign Relations]

Nuclear weapons proliferation, whether by state or nonstate actors, poses one of the greatest threats to international security today. Iran's apparent efforts to acquire nuclear weapons, what amounts to North Korean nuclear blackmail, and the revelation of the A.Q. Khan black market nuclear network all underscore the far-from-remote possibility that a terrorist group or a so-called rogue state will acquire weapons of mass destruction or materials for a dirty bomb.¶ The problem of nuclear proliferation is global, and any effective response must also be multilateral. Nine states (China, France, India, Israel, North Korea, Pakistan, Russia, the United Kingdom, and the United States) are known or believed to have nuclear weapons, and more than thirty others (including Japan, Germany, and South Korea) have the technological ability to quickly acquire them. Amid volatile energy costs, the accompanying push to expand nuclear energy, growing concerns about the environmental impact of fossil fuels, and the continued diffusion of scientific and technical knowledge, access to dual-use technologies seems destined to grow.¶ In the background, a nascent global consensus regarding the need for substantial nuclear arms reductions, if not complete nuclear disarmament, has increasingly taken shape. In April 2009, for instance, U.S. president Barack Obama reignited global nonproliferation efforts through a landmark speech in Prague. Subsequently, in September of the same year, the UN Security Council (UNSC) unanimously passed Resolution 1887, which called for accelerated efforts toward total nuclear disarmament. In February 2012, the number of states who have ratified the Comprehensive Test Ban Treaty increased to 157, heightening appeals to countries such as the United States, Israel, and Iran to follow suit.¶ Overall, the existing global nonproliferation regime is a highly developed example of international law. Yet, despite some notable successes, existing multilateral institutions have failed to prevent states such as India, Pakistan, and North Korea from "going nuclear," and seem equally ill-equipped to check Iran as well as potential threats from nonstate, terrorist groups. The current framework must be updated and reinforced if it is to effectively address today's proliferation threats, let alone pave the way for "the peace and security of a world without nuclear weapons."

#### New proliferators will be uniquely destabilizing -- guarantees conflict escalation.

Cimbala, ‘8

[Stephen, Distinguished Prof. Pol. Sci. – Penn. State Brandywine, Comparative Strategy, “Anticipatory Attacks: Nuclear Crisis Stability in Future Asia”, 27, InformaWorld]

If the possibility existed of a mistaken preemption during and immediately after the Cold War, between the experienced nuclear forces and command systems of America and Russia, then it may be a matter of even more concern with regard to states with newer and more opaque forces and command systems. In addition, the Americans and Soviets (and then Russians) had a great deal of experience getting to know one another’s military operational proclivities and doctrinal idiosyncrasies, including those that might influence the decision for or against war. Another consideration, relative to nuclear stability in the present century, is that the Americans and their NATO allies shared with the Soviets and Russians a commonality of culture and historical experience. Future threats to American or Russian security from weapons of mass destruction may be presented by states or nonstate actors motivated by cultural and social predispositions not easily understood by those in the West nor subject to favorable manipulation during a crisis. The spread of nuclear weapons in Asia presents a complicated mosaic of possibilities in this regard. States with nuclear forces of variable force structure, operational experience, and command-control systems will be thrown into a matrix of complex political, social, and cultural crosscurrents contributory to the possibility of war. In addition to the existing nuclear powers in Asia, others may seek nuclear weapons if they feel threatened by regional rivals or hostile alliances. Containment of nuclear proliferation in Asia is a desirable political objective for all of the obvious reasons. Nevertheless, the present century is unlikely to see the nuclear hesitancy or risk aversion that marked the Cold War, in part, because the military and political discipline imposed by the Cold War superpowers no longer exists, but also because states in Asia have new aspirations for regional or global respect.12 The spread of ballistic missiles and other nuclear-capable delivery systems in Asia, or in the Middle East with reach into Asia, is especially dangerous because plausible adversaries live close together and are already engaged in ongoing disputes about territory or other issues.13 The Cold War Americans and Soviets required missiles and airborne delivery systems of intercontinental range to strike at one another’s vitals. But short-range ballistic missiles or fighter-bombers suffice for India and Pakistan to launch attacks at one another with potentially “strategic” effects. China shares borders with Russia, North Korea, India, and Pakistan; Russia, with China and NorthKorea; India, with Pakistan and China; Pakistan, with India and China; and so on. The short flight times of ballistic missiles between the cities or military forces of contiguous states means that very little time will be available for warning and attack assessment by the defender. Conventionally armed missiles could easily be mistaken for a tactical nuclear first use. Fighter-bombers appearing over the horizon could just as easily be carrying nuclear weapons as conventional ordnance. In addition to the challenges posed by shorter flight times and uncertain weapons loads, potential victims of nuclear attack in Asia may also have first strike–vulnerable forces and command-control systems that increase decision pressures for rapid, and possibly mistaken, retaliation. This potpourri of possibilities challenges conventional wisdom about nuclear deterrence and proliferation on the part of policymakers and academic theorists. For policymakers in the United States and NATO, spreading nuclear and other weapons of mass destruction in Asia could profoundly shift the geopolitics of mass destruction from a European center of gravity (in the twentieth century) to an Asian and/or Middle Eastern center of gravity (in the present century).14 This would profoundly shake up prognostications to the effect that wars of mass destruction are now passe, on account of the emergence of the “Revolution in Military Affairs” and its encouragement of information-based warfare.15 Together with this, there has emerged the argument that large-scale war between states or coalitions of states, as opposed to varieties of unconventional warfare and failed states, are exceptional and potentially obsolete.16 The spread of WMD and ballistic missiles in Asia could overturn these expectations for the obsolescence or marginalization of major interstate warfare.

#### Extinction.

Krieger, ‘9

[David, Pres. Nuclear Age Peace Foundation and Councilor – World Future Council, “Still Loving the Bomb After All These Years”, 9-4, https://www.wagingpeace.org/articles/2009/09/04\_krieger\_newsweek\_response.php?krieger]

Jonathan Tepperman’s article in the September 7, 2009 issue of Newsweek, “Why Obama Should Learn to Love the Bomb,” provides a novel but frivolous argument that nuclear weapons “may not, in fact, make the world more dangerous….” Rather, in Tepperman’s world, “The bomb may actually make us safer.” Tepperman shares this world with Kenneth Waltz, a University of California professor emeritus of political science, who Tepperman describes as “the leading ‘nuclear optimist.’” Waltz expresses his optimism in this way: “We’ve now had 64 years of experience since Hiroshima. It’s striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states.” Actually, there were a number of proxy wars between nuclear weapons states, such as those in Korea, Vietnam and Afghanistan, and some near disasters, the most notable being the 1962 Cuban Missile Crisis. Waltz’s logic is akin to observing a man falling from a high rise building, and noting that he had already fallen for 64 floors without anything bad happening to him, and concluding that so far it looked so good that others should try it. Dangerous logic! Tepperman builds upon Waltz’s logic, and concludes “that all states are rational,” even though their leaders may have a lot of bad qualities, including being “stupid, petty, venal, even evil….” He asks us to trust that rationality will always prevail when there is a risk of nuclear retaliation, because these weapons make “the costs of war obvious, inevitable, and unacceptable.” Actually, he is asking us to do more than trust in the rationality of leaders; he is asking us to gamble the future on this proposition. “The iron logic of deterrence and mutually assured destruction is so compelling,” Tepperman argues, “it’s led to what’s known as the nuclear peace….” But if this is a peace worthy of the name, which it isn’t, it certainly is not one on which to risk the future of civilization. One irrational leader with control over a nuclear arsenal could start a nuclear conflagration, resulting in a global Hiroshima. Tepperman celebrates “the iron logic of deterrence,” but deterrence is a theory that is far from rooted in “iron logic.” It is a theory based upon threats that must be effectively communicated and believed. Leaders of Country A with nuclear weapons must communicate to other countries (B, C, etc.) the conditions under which A will retaliate with nuclear weapons. The leaders of the other countries must understand and believe the threat from Country A will, in fact, be carried out. The longer that nuclear weapons are not used, the more other countries may come to believe that they can challenge Country A with impunity from nuclear retaliation. The more that Country A bullies other countries, the greater the incentive for these countries to develop their own nuclear arsenals. Deterrence is unstable and therefore precarious. Most of the countries in the world reject the argument, made most prominently by Kenneth Waltz, that the spread of nuclear weapons makes the world safer. These countries joined together in the Nuclear Non-Proliferation Treaty (NPT) to prevent the spread of nuclear weapons, but they never agreed to maintain indefinitely a system of nuclear apartheid in which some states possess nuclear weapons and others are prohibited from doing so. The principal bargain of the NPT requires the five NPT nuclear weapons states (US, Russia, UK, France and China) to engage in good faith negotiations for nuclear disarmament, and the International Court of Justice interpreted this to mean complete nuclear disarmament in all its aspects. Tepperman seems to be arguing that seeking to prevent the proliferation of nuclear weapons is bad policy, and that nuclear weapons, because of their threat, make efforts at non-proliferation unnecessary and even unwise. If some additional states, including Iran, developed nuclear arsenals, he concludes that wouldn’t be so bad “given the way that bombs tend to mellow behavior.” Those who oppose Tepperman’s favorable disposition toward the bomb, he refers to as “nuclear pessimists.” These would be the people, and I would certainly be one of them, who see nuclear weapons as presenting an urgent danger to our security, our species and our future. Tepperman finds that when viewed from his “nuclear optimist” perspective, “nuclear weapons start to seem a lot less frightening.” “Nuclear peace,” he tells us, “rests on a scary bargain: you accept a small chance that something extremely bad will happen in exchange for a much bigger chance that something very bad – conventional war – won’t happen.” But the “extremely bad” thing he asks us to accept is the end of the human species. Yes, that would be serious. He also doesn’t make the case that in a world without nuclear weapons, the prospects of conventional war would increase dramatically. After all, it is only an unproven supposition that nuclear weapons have prevented wars, or would do so in the future. We have certainly come far too close to the precipice of catastrophic nuclear war. As an ultimate celebration of the faulty logic of deterrence, Tepperman calls for providing any nuclear weapons state with a “survivable second strike option.” Thus, he not only favors nuclear weapons, but finds the security of these weapons to trump human security. Presumably he would have President Obama providing new and secure nuclear weapons to North Korea, Pakistan and any other nuclear weapons states that come along so that they will feel secure enough not to use their weapons in a first-strike attack. Do we really want to bet the human future that Kim Jong-Il and his successors are more rational than Mr. Tepperman?

#### 2nd terrorism – Nuclear terrorism is extremely likely

**Jaspal 12** – Associate Professor at the School of Politics and International Relations, Quaid-i-Azam University, Islamabad, Pakistan

(Zafar Nawaz, “Nuclear/Radiological Terrorism: Myth or Reality?”, Journal of Political Studies, Vol. 19, Issue - 1, 2012, 91:111, dml)

The misperception, miscalculation and above all ignorance of the ruling elite about security puzzles **are perilous** for the national security of a state. Indeed, in an age of transnational terrorism and **unprecedented dissemination of dualuse nuclear technology**, ignoring nuclear terrorism threat is an imprudent policy choice. The incapability of terrorist organizations to engineer fissile material **does not eliminate** completely the possibility of nuclear terrorism. At the same time, the absence of an example or precedent of a nuclear/ radiological terrorism **does not qualify the assertion** that the nuclear/radiological terrorism ought to be remained a myth. Farsighted rationality obligates that one should not miscalculate **transnational terrorist groups** — whose behavior suggests that they have a death wish — of acquiring nuclear, radiological, chemical and biological material producing capabilities. In addition, one could be sensible about the published information that **huge amount of nuclear material** is spread around the globe. According to estimate it is enough to build **more than** 120,000 **Hiroshima-sized nuclear bombs** (Fissile Material Working Group, 2010, April 1). The alarming fact is that a few storage sites of nuclear/radiological materials **are inadequately secured** and continue to be accumulated in unstable regions (Sambaiew, 2010, February). Attempts at stealing fissile material had already been discovered (Din & Zhiwei, 2003: 18). Numerous evidences confirm **that terrorist groups had aspired to acquire fissile material** for their terrorist acts. Late Osama bin Laden, the founder of al Qaeda stated that acquiring nuclear weapons was a“religious duty” (Yusufzai, 1999, January 11). The IAEA also reported that “al-Qaeda was actively seeking an atomic bomb.” Jamal Ahmad al-Fadl, a dissenter of Al Qaeda, in his trial testimony had “revealed his extensive but unsuccessful efforts to acquire enriched uranium for al-Qaeda” (Allison, 2010, January: 11). On November 9, 2001, Osama bin Laden claimed that “we have chemical and nuclear weapons as a deterrent and if America used them against us we reserve the right to use them (Mir, 2001, November 10).” On May 28, 2010, Sultan Bashiruddin Mahmood, a Pakistani nuclear scientist confessed that he met Osama bin Laden. He claimed that “I met Osama bin Laden before 9/11 not to give him nuclear know-how, but to seek funds for establishing a technical college in Kabul (Syed, 2010, May 29).” He was arrested in 2003 and after extensive interrogation by American and Pakistani intelligence agencies he was released (Syed, 2010, May 29). Agreed, Mr. Mahmood did not share nuclear know-how with Al Qaeda, but his meeting with Osama establishes the fact that the terrorist organization was in contact with nuclear scientists. Second, the terrorist group **has sympathizers in the nuclear scientific bureaucracies**. It also authenticates bin Laden’s Deputy Ayman Zawahiri’s claim which he made in December 2001: “If you have $30 million, go to the black market in the central Asia, contact any disgruntled Soviet scientist and a lot of dozens of smart briefcase bombs are available (Allison, 2010, January: 2).” The covert meetings between nuclear scientists and al Qaeda members **could not be interpreted as idle threats** and thereby the threat of nuclear/radiological terrorism is real. The 33Defense Secretary Robert Gates admitted in 2008 that “what keeps every senior government leader awake at night is the thought of a terrorist ending up with a weapon of mass destruction, especially nuclear (Mueller, 2011, August 2).” Indeed, **the nuclear deterrence strategy** cannot deter **the transnational terrorist syndicate** from nuclear/radiological terrorist attacks. Daniel Whiteneck pointed out: “**Evidence suggests**, for example, that al Qaeda might not only use WMD simply to demonstrate the magnitude of its capability but that it might actually welcome **the escalation of a strong U.S. response**, **especially if it included** catalytic effects **on governments** and societies in the Muslim world. An adversary that prefers escalation regardless of the consequences cannot be deterred” (Whiteneck, 2005, Summer: 187) Since taking office, President Obama has been reiterating that “nuclear weapons represent the ‘gravest threat’ to United States and international security.” While realizing that the US could not prevent nuclear/radiological terrorist attacks singlehandedly, he launched 47an international campaign to convince the international community about the increasing threat of nuclear/ radiological terrorism. He stated on April 5, 2009: “Black market trade in nuclear secrets and nuclear materials abound. The technology to build a bomb has spread. Terrorists are determined to buy, build or steal one. Our efforts to contain these dangers are centered on **a global non-proliferation regime**, but as more people and nations break the rules, we could reach the point where **the center cannot hold** (Remarks by President Barack Obama, 2009, April 5).” He added: “One terrorist with one nuclear weapon could unleash massive destruction. Al Qaeda has said it seeks a bomb and that it would have no problem with using it. And we know that there is unsecured nuclear material across the globe” (Remarks by President Barack Obama, 2009, April 5). In July 2009, at the G-8 Summit, President Obama announced the convening of a Nuclear Security Summit in 2010 to deliberate on the mechanism to “secure nuclear materials, combat nuclear smuggling, and prevent nuclear terrorism” (Luongo, 2009, November 10). President Obama’s nuclear/radiological threat perceptions were also accentuated by the United Nations Security Council (UNSC) Resolution 1887 (2009). The UNSC expressed its grave concern regarding ‘the threat of nuclear terrorism.” It also recognized the need for all States “to take effective measures to prevent nuclear material or technical assistance becoming available to terrorists.” The UNSC Resolution called “for universal adherence to the Convention on Physical Protection of Nuclear Materials and its 2005 Amendment, and the Convention for the Suppression of Acts of Nuclear Terrorism.” (UNSC Resolution, 2009) The United States Nuclear Posture Review (NPR) document revealed on April 6, 2010 declared that “terrorism and proliferation are far greater threats **to the United States and international stability**.” (Security of Defence, 2010, April 6: i). The United States declared that it reserved the right to“hold fully accountable” any state or group “that supports or enables terrorist efforts to obtain or use weapons of mass destruction, whether by facilitating, financing, or providing expertise or safe haven for such efforts (Nuclear Posture Review Report, 2010, April: 12)”. This declaration underscores the possibility that terrorist groups could acquire fissile material from the rogue states.

#### And, wet pool storage facilities are uniquely vulnerable now

Werner, 12 [U.S. Spent Nuclear Fuel Storage James D. Werner Section Research Manager May 24, 2012, http://www.fas.org/sgp/crs/misc/R42513.pdf]

The locations of SNF wet pool storage in relation to the associated nuclear reactor may present potential risks associated with those designs. For example, most boiling water reactors (BWRs) in the United States, including the GE Mark I, are designed with the SNF storage pool located inside the same secondary containment structure as the reactor and many critical control systems, and located well above ground level. Many have expressed concern that this design may pose safety risks because any problems with the reactor can affect the SNF storage pools, and vice versa.135 For example, in a loss of off-site power situation, such as occurred at the GE Mark I reactors in Fukushima, Japan, the SNF pool may also lose power, affecting the cooling water and monitoring systems. In the case of the incident in Japan, elevated radiation near the reactor hindered personnel from mitigating problems or monitoring the SNF storage pools. In addition, the height of the SNF pools in many BWRs (more than 100 feet above ground level) could also pose safety risks because of the elevated access challenge and potential for a loss of coolant in a structural failure, compared to reactors with the SNF storage pools at or below ground level. Prior to the Fukushima Dai-ichi incident, the biggest change in the risk profile for SNF storage occurred in the wake of the September 11, 2001, terrorist attacks, after which a congressionally mandated National Academy of Sciences report concluded that “attacks with civilian aircraft remain a credible threat.”136 NAS indicated that terrorists might choose to attack spent nuclear fuel pools because they are “less well protected structurally than reactor cores**”** and “typically contain inventories of medium- and long-lived radionuclides that are several times greater than those contained in reactor cores.”137 In response, NRC issued a series of orders and letters to licensees, the contents of which are confidential. NRC also conducted site-specific evaluations to review individual site risks and readiness, resulting in site modifications, the details of which are also confidential. Although the reviews, orders, and letters resulted in numerous incremental improvements to SNF storage facilities and operations, such as improved backup power supply reliability, there was no large-scale shift of SNF out of wet pools and into dry casks, nor was there a mandate to move SNF into hardened storage facilities.

#### And, the only impediment to escalating terror is access to spent fuel

NTI, 12 [Nuclear Threat Initiative, August 1st,“Why Is Highly Enriched Uranium a Threat?”, <http://www.nti.org/analysis/reports/civilian-heu-reduction-and-elimination/>]

Why Is Highly Enriched Uranium a Threat? The most difficult challenge for a terrorist organization seeking to build a nuclear weapon or [improvised nuclear device](http://www.nti.org/glossary/improvised-nuclear-device-ind/) is obtaining [fissile material](http://www.nti.org/glossary/fissile-material/), either [plutonium](http://www.nti.org/glossary/plutonium-pu/) or [highly enriched uranium (HEU)](http://www.nti.org/glossary/highly-enriched-uranium-heu/). HEU, [uranium](http://www.nti.org/glossary/uranium/) that has been processed to increase the proportion of the U-235 [isotope](http://www.nti.org/glossary/isotope/) to over 20%, is required for the construction of a [gun-type nuclear device](http://www.nti.org/glossary/gun-type-nuclear-weapon/), the simplest type of nuclear weapon. The greater the proportion of U-235 (i.e. the higher the [enrichment](http://www.nti.org/glossary/enriched-uranium/) level), the less material is needed for a nuclear explosive device. [Weapons-grade uranium](http://www.nti.org/glossary/weapons-grade-material/) generally refers to uranium enriched to at least 90%, but material of far lower enrichment levels, found in both fresh and [spent nuclear fuel](http://www.nti.org/glossary/spent-nuclear-fuel/), can be used to create a nuclear explosive device. In 2002, the U.S. National Research Council warned that "crude HEU weapons could be fabricated without state assistance," noting that "the primary impediment that prevents countries or technically competent terrorist groups from developing nuclear weapons is the availability of [nuclear material], especially HEU."[1] Creating a nuclear weapon from HEU is technically easier than building a [plutonium](http://www.nti.org/glossary/plutonium-pu/) weapon. Moreover, current technology is unlikely to detect a shielded nuclear device on a truck or boat. Therefore, securing and eliminating stocks of HEU is the surest way to decrease the risk that terrorist groups could use this material to create a nuclear explosion. Where Is Civilian HEU Located? Experts estimate that approximately 70 tons of HEU are used in civilian applications worldwide. [2] As little as 25 kilograms (kg) of U-235 (which amounts to about 28kg of HEU enriched to 90%) is needed to produce a nuclear weapon; about 40-60kg is needed for a cruder nuclear device. [3] Bomb-grade material can be obtained from HEU that is fresh (unirradiated), and [irradiated](http://www.nti.org/glossary/irradiate/) (also referred to as spent). Fresh and lightly irradiated fuel (such as fuel used in critical assemblies and pulse reactors) is not significantly [radioactive](http://www.nti.org/glossary/radioactivity/), and is therefore relatively safe to handle. Although using nuclear fuel in high-powered reactors initially makes it highly radioactive and thus very difficult to handle safely (often this fuel is referred to as "self-protecting"), [spent fuel](http://www.nti.org/glossary/spent-nuclear-fuel/) loses its radioactivity over time, making it easier to handle and potentially more attractive to terrorists. HEU is currently used in the civilian sphere to fuel [research reactors](http://www.nti.org/glossary/research-reactor/), critical assemblies, pulsed reactors, and a few fast reactors. According to the [International Atomic Energy Agency (IAEA)](http://www.nti.org/glossary/international-atomic-energy-agency/), 244 research reactors are in operation or temporarily shut down across 56 countries. A further 441 reactors have been shut down or decommissioned, while eight are planned or under construction. [4] Many of the research reactors that have been shut down, but not decommissioned, have spent HEU fuel on-site. The IAEA database notes that over 20,000 spent fuel assemblies from research reactors are enriched to levels above 20 percent. Nearly half of these stored fuel assemblies are enriched to levels at or above 90 percent.[5] That said, there is no current comprehensive, authoritative inventory of civil HEU globally, which is a major obstacle to progress in this area. According to the Government Accountability Office, even the [United States](http://www.nti.org/country-profiles/united-states/) has failed to maintain an accurate inventory of the HEU that it has exported over the years as attempts to balance the books could only account for 10 percent of the material. [6] The United States and the [Soviet Union](http://www.nti.org/country-profiles/russia/) supplied much of the HEU fuel used in research reactors world-wide. Other producers include [China](http://www.nti.org/country-profiles/china/) (which sent HEU fuel for research reactors to Nigeria, Ghana, [Iran](http://www.nti.org/country-profiles/iran/), [Pakistan](http://www.nti.org/country-profiles/pakistan/), and [Syria](http://www.nti.org/country-profiles/syria/), as well as enriched uranium to [South Africa](http://www.nti.org/country-profiles/south-africa/), and [Argentina](http://www.nti.org/country-profiles/argentina/)); [France](http://www.nti.org/country-profiles/france/) (to Chile and [India](http://www.nti.org/country-profiles/india/)); the [United Kingdom](http://www.nti.org/country-profiles/united-kingdom/) (to [Australia](http://www.nti.org/country-profiles/australia/), India, and [Japan](http://www.nti.org/country-profiles/japan/)); and South Africa (which did not export this fuel).[7] Before 1978, when Washington and Moscow became concerned about the implications of their exports of highly enriched fuels, most of the fuel supplied by the United States (the bulk of which went to North American and the Asia-Pacific), was of very high enrichment levels (90% and above). The Soviet-supplied fuel, chiefly sent to Eastern Europe, was typically 80% enriched. Under several U.S.-led initiatives, many countries have returned HEU fuel, both fresh and spent, to its country of origin in order to reduce the risk of theft. HEU is also used in targets in reactors that produce [medical isotopes](http://www.nti.org/glossary/medical-isotopes/). HEU is used for this purpose annually in reactors in Belgium, Canada, France, the Netherlands, and Russia.[8] Other countries, including Australia and [Indonesia](http://www.nti.org/country-profiles/indonesia/), have begun producing these isotopes with [LEU](http://www.nti.org/glossary/low-enriched-uranium-leu/) targets, and still other countries, such as [Egypt](http://www.nti.org/country-profiles/egypt/), are currently developing and implementing their LEU target-based production process. [9] In particular, South Africa—a major exporter—converted its Safari-1 reactor to rely on both LEU targets and fuel for the production of [medical isotopes](http://www.nti.org/glossary/radioisotope/). Most of the other major producers of medical isotopes, including Canada, the Netherlands, and France, utilize LEU fuels in their reactors, but continue to rely on HEU targets. However, a number of these countries, particularly in Western Europe, have pledged to convert to LEU targets. Progress towards fuller use of LEU is not universal, however. A Russian project, for example, aims to produce enough molybdenum-99 using HEU fuel and targets to satisfy 20 percent of global demand by 2015. [10] In addition to use in research and test reactors and for medical isotope production, HEU is used in naval propulsion and space propulsion research. The material is also used for testing fast reactor core designs using [mixed oxide (MOX) fuel](http://www.nti.org/glossary/mixed-oxide-mox-fuel/). For further information on HEU in civilian applications, see [Civilian Uses of HEU](http://www.nti.org/analysis/articles/civilian-uses-heu/). Security of Civilian HEU Many civilian facilities with HEU on-site do not have adequate security. The IAEA reported that during one of its missions, it discovered a research reactor with HEU that "was observed to have essentially no physical protection." [11] The IAEA assisted the facility with enhancing its security, but reported that overall, "deficiencies remain in the legal, administrative, and technical arrangements for controlling and protecting nuclear materials ... in many countries." [12] The U.S. Department of Energy has been assisting with physical protection upgrades for 22 foreign research reactors through the Global Research Reactor Program. A September 2009 GAO report found that while most sites that have received upgrades generally met IAEA security guidelines, in some cases, critical security weaknesses remained. [23] It is not a simple matter to upgrade security measures; the majority of the world's research reactors are located in universities or other publicly accessible research centers. While security concerns have dramatically increased since 9/11, it is difficult to reconfigure a site that was not built with physical protection in mind. Storage of spent fuel stocks is generally even less secure than fresh fuel stocks, as until a few years ago spent nuclear fuel was considered "self-protecting" and few facilities wanted to spend money securing a material that was no longer of economic value. It is far more effective to remove this material from vulnerable locations than to attempt to increase security on-site. Programs to Reduce and Eliminate HEU There have been efforts to reduce the amount of HEU at civilian facilities since 1978, when Washington initiated the [Reduced Enrichment for Research and Test Reactors (RERTR) Program](http://www.nti.org/glossary/rertr-program/). Moscow also began its own program to reduce enrichment at Soviet-built research reactors outside of the Soviet Union, and changed its HEU export policies, supplying these reactors with 36% HEU in lieu of 80% HEU. In the past 25 years, many countries have cooperated with the RERTR program or initiated their own, similar programs. In May 2004, the U.S. Department of Energy launched the [Global Threat Reduction Initiative (GTRI](http://www.nti.org/glossary/global-threat-reduction-initiative/)), which the IAEA, Russia, and others have since joined. Among its goals, the GTRI seeks to "minimize and eventually eliminate any reliance on HEU in the civilian fuel cycle, including conversion of research and test reactors worldwide from the use of HEU to the use of LEU fuel and targets." As of early 2012, U.S.-led efforts have converted to LEU or verified the shut down of 88 HEU-fueled facilities.[14] The RERTR program is also working on the conversion of a handful of medical isotope producers that use HEU targets in their reactors. The program includes some of the largest producers of medical isotopes, located in Europe. To date, the RERTR program has helped to successfully convert isotope-producing reactors in Argentina and South Africa. At present, there are no longer any technical barriers to conversion to LEU and only political and financial issues remain. [15] Besides converting facilities to use LEU fuel and targets, there have also been efforts to consolidate fresh and spent HEU fuel at a smaller number of relatively secure locations. This has involved removing the fuel, mostly to the United States and Russia, from other countries, as well as consolidating the fuel within countries. U.S. programs in this area (the Russian Research Reactor Fuel Return program to repatriate fuel to Russia, and the Foreign Research Reactor Spent Nuclear Fuel Acceptance Program to repatriate U.S.-origin fuel), have all been subsumed under the 2004 GTRI initiative. Together, the two programs have returned over 2,735kg of spent and fresh HEU fuel to the United States and Russia as of 2012. [16] According to the IAEA's definition of the quantity of HEU necessary to construct a nuclear explosive device, the amount of repatriated HEU is equivalent to up to 80 weapons. [17] Despite the progress of these efforts, many HEU sites remain worldwide, with a significant portion of them located in Russia. [26] A related program, the Material Consolidation and Conversion (MCC) project, established in 1999, reduces this excess Russian civilian HEU by blending it down into LEU. As of the end of 2011, approximately 13.5 of an estimated 17 tons of U-235 in excess Russian civilian HEU had been blended down. [18] Both the United States and Russia also have large quantities of excess HEU from their defense programs. In Russia, excess HEU from weapons is blended down to LEU within the framework of the Megatons to Megawatts program (also known as the [HEU-LEU program](http://www.nti.org/glossary/heu-deal/)). The resulting LEU is then released for civilian use. The program will end in 2013, at which point 500 tons of HEU will have been downblended. [19] The United States initially declared some 174 metric tons of HEU as excess to military needs, designating this material as civilian. [20] An additional 200 metric tons were officially removed from the U.S. weapons stockpile in November 2005. [21]

#### That’s key to the nuclear taboo – solves nuclear war

Bin ‘9(5-22-09 About the Authors Prof. Li Bin is a leading Chinese expert on arms control and is currently the director of Arms Control Program at the Institute of International Studies, Tsinghua University. He received his Bachelor and Master Degrees in Physics from Peking University before joining China Academy of Engineering Physics (CAEP) to pursue a doctorate in the technical aspects of arms control. He served as a part-time assistant on arms control for the Committee of Science, Technology and Industry for National Defense (COSTIND).Upon graduation Dr. Li entered the Institute of Applied Physics and Computational Mathematics (IAPCM) as a research fellow and joined the COSTIND technical group supporting Chinese negotiation team on Comprehensive Test Ban Treaty (CTBT). He attended the final round of CTBT negotiations as a technical advisor to the Chinese negotiating team. Nie Hongyi is an officer in the People’s Liberation Army with an MA from China’s National Defense University and a Ph.D. in International Studies from Tsinghua University, which he completed in 2009 under Prof. Li Bin. )

The nuclear taboo is a kind of international norm and this type of norm is supported by the promotion of the norm through international social exchange. But at present the increased **threat of nuclear terrorism has lowered people’s confidence that nuclear weapons will not be used**. China and the United States have a broad common interest in combating nuclear terrorism. **Using technical and institutional measures to break the foundation of nuclear terrorism and lessen the possibility of a nuclear terrorist attack can** not only weaken the danger of nuclear terrorism itself but also **strengthen people’s confidence in the nuclear taboo**, and in this way preserve an international environment beneficial to both China and the United States. In this way **even if there is crisis** in China-U.S. relations caused by conflict, **the nuclear taboo can** also help both countries **reduce suspicions** about the nuclear weapons problem, **avoid miscalculation and thereby reduce the danger of a nuclear war.**

#### Causes extinction – retal

**Ayson 10** (Robert, Professor of Strategic Studies, Director of Strategic Studies: New Zealand, Senior Research Associate with Oxford’s Centre for International Studies. “After a Terrorist Nuclear Attack: Envisaging Catalytic Effects. Studies in Conflict and Terrorism, Volume 33, Issue 7, July 2010, pages 571-593)

Washington's early response to a terrorist nuclear attack on its own soil might also raise the possibility of an unwanted (and nuclear aided) confrontation with Russia and/or China. For example, in the noise and confusion during the immediate aftermath of the terrorist nuclear attack, the U.S. president might be expected to place the country's armed forces, including its nuclear arsenal, on a higher stage of alert. In such a tense environment, when careful planning runs up against the friction of reality, it is just possible that Moscow and/or China might mistakenly read this as a sign of U.S. intentions to use force (and possibly nuclear force) against them. In that situation, the temptations to preempt such actions might grow, although it must be admitted that any preemption would probably still meet with a devastating response. As part of its initial response to the act of nuclear terrorism (as discussed earlier) Washington might decide to order a significant conventional (or nuclear) retaliatory or disarming attack against the leadership of the terrorist group and/or states seen to support that group. Depending on the identity and especially the location of these targets, Russia and/or China might interpret such action as being far too close for their comfort, and potentially as an infringement on their spheres of influence and even on their sovereignty. One far-fetched but perhaps not impossible scenario might stem from a judgment in Washington that some of the main aiders and abetters of the terrorist action resided somewhere such as Chechnya, perhaps in connection with what Allison claims is the “Chechen insurgents' … long-standing interest in all things nuclear.”42 American pressure on that part of the world would almost certainly raise alarms in Moscow that …might require a degree of advanced consultation from Washington that the latter found itself unable or unwilling to provide.

#### And, the plan solves unauthorized diversion

**Archambeau et al 11** – Science Council for Global Initiatives

(Charles, with Randolph Ware, Tom Blees, Barry Brook, Yoon Chang, Jerry Peterson, Robert Serafin, Joseph Shuster, Evgeny Velikhov, and Tom Wigley, “The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs”, google it, dml)

Pyroprocessing was originally developed for integration with a fast reactor, but it can also be used in a stand-alone mode to **treat spent fuel** from today's commercial reactors with the addition of a front-end step to convert the used oxide fuel to metallic form. **Pyroprocessing** eliminates **the ability to use the reactor's nuclear materials directly in weapons** because it cannot separate out any Plutonium (Pu). Instead, it keeps the major nuclear fuels, Uranium and Plutonium mixed, at all times, with other actinides and fission products. This mixture is protected **against theft or unauthorized diversion** because the mixture is extremely radioactive and must be handled remotely with sophisticated and specialized equipment.

#### IFR key

**Archambeau et al 11** – Science Council for Global Initiatives

(Charles, with Randolph Ware, Tom Blees, Barry Brook, Yoon Chang, Jerry Peterson, Robert Serafin, Joseph Shuster, Evgeny Velikhov, and Tom Wigley, “The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs”, google it, dml)

The pyroprocessor unit can be used as a stand-alone system to process LWR waste from any open cycle reactor into fuel for IFR closed cycle reactors. The depleted Uranium produced by the enrichment of Uranium ore can also be processed to generate additional IFR fuel. The current amount of LWR waste, plus the amount of depleted Uranium in stock piles world-wide, is sufficient to supply fuel to all the IFR plants needed and in fact to supply the world's required energy for about 1000 years.3 The problem of storage of current LWR waste and depleted Uranium waste from refining of mined Uranium is therefore solved by pyroprocessor generation of IFR fuel, along with a relatively small mass of short-lived fission products which can be easily and safely stored. Uranium can also be extracted from sea water using IFR power sources (see, for example, Cohen, 1983). Because Uranium is constantly added to seawater by erosion processes, then the IFR fuel source is effectively unlimited. Therefore, IFR power plants do not require fuel from regular mining operations, as does a LWR powered plant, but can use pyroprocessor generated fuel essentially indefinitely. In this sense the IFR is a "renewable" energy source which can be expanded, essentially indefinitely, to meet demand.

#### 3rd competitiveness – US is ceding nuclear competitiveness now

**Barton 11** [Charles Barton, Nuclear Green, “Have the Chinese Been Reading Energy from Thorium or Nuclear Green?” 1/31/11]

Last week the Chinese Academy of Science announced that it planned to finance the development of a Chinese Thorium Breeding Molten Salt Reactor (TMSR) or as it is called in the United States, the Liquid Fluoride Thorium Reactor (LFTR). The announcement came in a news report from Weihui.news365.com.cn. The announcement was relayed to Westerners who were interested in Thorium breeding molten salt reactors in a discussion thread comment posted by Chinese Scientist Hua Bai, last Friday. Kirk Sorensen, Brian Wang, and I all posted about Bai's announcement on Sunday, January 30.¶ In addition to these posts, the thread which Hua Bai started contains the revelation that the engineer who heads the Chinese Molten Salt Reactor Project is none other than Jiang Mianheng, a son of Retired Chinese President, Jiang Zemin. In addition to being President of People's China, Jiang was the chairmanship of the powerful Central Military Commission, suggesting the likelihood that Jiang Mianheng has military ties. He is the cofounder of Semiconductor Manufacturing International Corporation, and a former lead researcher in the Chinese Space Program, as well as Vice President of the Chinese Academy of Sciences. The presence of such a well connected Chinese science leader suggests that the Chinese TMSR project is regarded as important by the Chinese leadership. Thus the Chinese leadership, unlike the American Political andscientific leadership has grasped the potential of molten salt nuclear technology.¶ Yesterday, "horos11" commented on my blog, Nuclear Green,¶ I read this, and I didn't know whether to laugh or cry.¶ After all, this site and others have been sounding the clarion call to action on this, and I should be glad that someone finally heeded it and its getting traction in a place that really matters, but I have a sinking feeling that:¶ a. its going to take far less than their planned 20 years¶ b. they are going to succeed beyond their wildest expectations.¶ Which means that the next, giant sucking sound we may hear is the sound of the 5 trillion dollar energy market heading east, further depressing our economy, weakening the dollar (and the euro) and ultimately making the US economy dependent on rescue from the chinese in the future (when they are done rescuing themselves).¶ Yet, in the large scheme of things, this is a definite good, and may be our savior from anthropomorphic climate change.¶ so again, laugh? or cry. I guess its up to how you view things - I guess I'm tentatively laughing at the moment, but mostly from the overwhelming irony of all this.¶ Jason Ribeiro added,¶ I can't help but have a feeling of sour grapes about this. While I congratulate China for doing the obvious, America has its head buried so far in the sand it can't see straight. With all the internet clamor about LFTR that's been going on the internet in the past 3-4 years, it was the non-English speaking Chinese that finally got the message that this was a great idea worth investing in. Our leadership ought to be ashamed of themselves.¶ The Chinese News story on the Thorium Molten Salt Reactor reflects the clear Chinese thinking about the potential role of LFTRs in the future Chinese energy economy. I will paraphrase,¶ "the future of advanced nuclear fission energy - nuclear energy, thorium-based molten salt reactor system" project was officially launched. . . The scientific goal is to developed a new generation of nuclear energy systems [and to achieve commercial] use [in] 20 years or so. We intend to complete the technological research needed for this system and to assert intellectual property rights to this technology. Fossil fuel energy is being depleted, and solar and wind energy are not stable enough, while hydropower development has reached the limit of its potential.. . .¶ Nuclear power seems to offer us a very attractive future energy choice, high energy density, low carbon emissions, and the potential for sustainable development. . . . China has chosen {to make an energy] breakthrough in the direction of molten salt reactors. . . . this liquid fuel reactors has a simple structure and can run at atmospheric pressure, [it can use any fissionable material as fuel} and has other advantages. "This new stove" can be made very small, will operate with stabile nuclear fuel, and will run for several decades before replacement. After the thorium is completely used in the nuclear process the TMSR will produce nuclear waste will be only be one-thousandth of that produced by existing nuclear technologies.¶ As the world is still in the development of a new generation of nuclear reactors, the thorium-based independent research and development of molten salt reactors, will be possible to obtain all intellectual property rights. This will enable China to firmly grasp the lifeline of energy in their own hands.¶ Let the word "nuclear" no longer mean war.¶ In the past, people always talk about "core" colors. The Hiroshima atomic bomb, the Chernobyl nuclear power plant explosion, these are like a lingering nightmare that is marked in human history. But a new generation of nuclear power will take the color green, the mark of peace taking human beings into a new era.¶ Oh Wow! It sounds as if someone in China has been reading Nuclear Green or Energy from Thorium. And there is more!¶ In addition, the "new stove" operating at atmospheric pressure operation, rather than the traditional reactor operating at high pressure, will be simple and safe. "When the furnace temperature exceeds a predetermined value, in the bottom of the MSR core, a frozen plug of salt will automatically melt, releasing the liquid salt in the reactor core into an emergency storage tanks, and terminating the nuclear reaction," scientist Xu Hongjie told reporters, as the cooling agent is fluoride salts (the same salts that also carrying the nuclear fuel), after the liquid salt cools it turns solid, which prevents the nuclear fuel from leaking out of its containment, and thus will not pollute ground water causing an ecological disasters. The added safety opens up new possibilities for reactors, they can be built underground, completely isolating radioactive materials from the reactor, also the underground location will protect the reactor from an enemy's weapon attack. Reactors can be built in large cities, in the wilderness, or in remote villages.¶ Well Kirk Sorensen and I wanted our ideas to become national priorities. We just did not know in what country it would happen first. Unfortunately the leadership of the United States, continues to be determined to lead this nation into the wilderness of powerlessness, while the leadership of communist China is alert to the possibilities of a new energy age. Possibilities that can be realized by molten salt nuclear technology. Lets hope that someone in the White House or Congress wakes up. The Chinese understand the implications of their venture into Molten Salt nuclear technology. The American leadership does not.

#### That’s crucial to overall competitiveness

**Barton 10** (Charles Barton, Nuclear Green "Keeping up with China: The Economic Advantage of Molten Salt Nuclear Technology," 12/1/10)

American and European nuclear development can either proceed by following the cost lowering paths being pioneered in Asia, or begin to develop low cost innovative nuclear plans. Since low labor costs, represent the most significant Chinese and Indian cost advantage, it is unlikely that European and American reactor manufacturers will be able to compete with the Asians on labor costs. Labor costs for conventional reactors can be lowered by factory construction of reactor componant moduels, but the Chinese are clearly ahead of the West in that game. Yet the weakness of the Chinese system is the relatively large amount of field labor that the manufacture of large reactors requires.¶ The Chines system is to introduce labor saving devices where ever and when ever possible, but clearly shifting labor from the field to a factory still offers cost advantages. The more labor which can be performed in the factory, the more labor cost savings are possible. Other savings advantages are possible by simplifying reactor design, and lowering materials input. Building a reactor with less materials and fewer parts lowers nuclear costs directly and indirectly. Decreasing core size per unit of power output also can contribute a cost advantage. Direct saving relate to the cost of parts and matetials, but fewer parts and less material also means less labor is required to put things together, since there is less to put together. In addition a small reactor core structure, would, all other things being equal, require a smaller housing. Larger cores mean more structural housing expenses.¶ While the Pebel Bed Modular Reactor has a relatively simple core design, the actual core is quite large, because of the cooling inefficiency of helium. Thus, the simplisity of the PBMR core is ballanced by its size, its total materials input, and the size of its housing. The large core and housing requirements of the PBMR also adds to its labor costs, especially its field labor cost. Thus while the simplisity of the PBMR core design would seem to suggest a low cost, this expectation is unlikely to br born out in practice.¶ Transportation limits ability to shift production from the field to the factory. An analysis preformed by the University of Tennessee's, and the Massachusettes Institute of Technology's Departments of Nuclear Engineering looked at the 335 MW Westinghouse IRIS reactor. The analysis found,¶ A rough estimate of the weight for a 1000 MWt modular reactor and its secondary system, similar to the Westinghouse IRIS plant, is taken as the summation of all of the major components in the analysis. Many of the smaller subcomponents have been neglected. The containment structure contributes ~2.81E6 kg (3100 tons). The primary reactor vessel and the turbo-generator contribute ~1.45E6 kg (1600 tons) each. The heat exchange equipment and piping contribute ~6.78E5 kg (747 tons). Therefore, the total weight of the major plant components is~ 6.39E6 kg (7047 tons).¶ The weight and width of the IRIS would place constraints of barge transportation of the IRIS on the Tennessee and Ohio Rivers. The report stated,¶ The Westinghouse barge mounted IRIS reactor modules were limited in size based on input from the University of Tennessee. The barge dimension limitations were established to be 30 meters (98’-5”) wide, 100 meters (328’-1”) long, with a 2.74 meter (9’) draft. These dimensions establish the barge maximum displacement at 8,220 metric tons. In addition, the barge(s) are limited to ~20 meters (65’-7”) in height above the water surface, so that they fit under crossing bridges and can be floated up the Mississippi, Ohio, and Tennessee Rivers as far as the city of Chattanooga, Tennessee. Further movement above Chattanooga is currently limited by the locks at the Chickamauga Reservoir dam.¶ The above barge displacement limitation will impose severe limits on how much structural support and shield concrete can be placed in the barge modules at the shipyard. For example, the estimated weight of concrete in the IRIS containment and the surrounding cylindrical shield structure alone greatly exceeds the total allowable barge displacement. This however does not mean that barge- mounted pressurized water reactors (PWRs) are not feasible. It does mean that barge-mounted PWRs need to employ steel structures that are then used as the forms for the addition of needed concrete after the barge has been floated into its final location and founded.¶ Thus for the IRIS, barge transportation presented problems, and rail transportation was unthinkable. The core of the 125 MW B&W mPower reactor is rail transportable, but final onsite mPower assembly/construction became a significant undertaking, with a consequent increase in overall cost. The core unit does include a pressure vessel and heat exchange mounted above the actual reactor, but many other mPower component modules must be transported seperately and assembled on site.¶ The IIRIS project demonstrates the unlikelihood of whole small reactors being transported to the field ready for energy production without some field construction. This might be possible, however, for mini reactors that are two small to be viewed as a plausible substitute for the fossil fuel powered electrical plants currently supplying electricity for the grid. This then leaves us with¶ with a gap between the cost savings potential of factory manufacture, and the costly process of onsite assembly. B&W the manufacturers of the small 125 MW MPower reactor still has not clarified what percentage of the manufacturing process would be factory based. It is clear, however that B&W knows where it is comming from and what its problems are, as Rod Adams tells us:¶ I spoke in more detail to Chris Mowry and listened as he explained how his company's research on the history of the nuclear enterprise in the US had revealed that 30% of the material and labor cost of the existing units came from the supplied components while 70% was related to the site construction effort. He described how the preponderance of site work had influenced the cost uncertainty that has helped to discourage new nuclear plant construction for so many years.¶ What Mowey did not tell Adams is what percentage of the materials and labor costs will be shifted to the factory as mPower reactors are produced. There have been hints that a significant percentage of the mPower manufacturing process, perhaps as much as 50% will still take place on site. B&W still is working on the design of their manufacturing process, and thus do not yet know all of the details. Clearly then more work needs to be done on controlling onsite costs.¶ Finally, a shift to advanced technology will can lower manufacturing costs. Compared to Light Water reactors, Liquid metal cooled reactors use less material and perhaps less labor, but pool type liqiod metal reactors are not compact. Compared to Liquid Metal cooled reactors, Molten Salt cooled reactor will have more compact cores. Shifting to closed cycle gas turbines will decrease construction costs. The added safety of Molten Salt cooled reactors will increase reactor simplification, and thus further lower labor and materials related construction costs.¶ The recycling of old power plant locations will also offer some savings. Decreasing manufacturing time will lower interest costs. ¶ All in all there are a lot of reasons to expect lower nuclear manufacturing costs with Generation IV nuclear power plants, and at present no one has come up with a good reason for expecting Molten Salt cooled reactors to cost more than traditional NPPs. The argument, however, is not iron clad. Even if no one has pointed out plasuible errors in it, we need to introduce the caviot that expectations frenquently are not meet. It is possible, for example that the NRC might impose unreasonable expectations on molten salt cooled reactors. Demanding, for example, that they include the same safety features as LWRs, even though they do not have many LWR safety problems. But the potential savings on the cost of energy by adopting molten salt nuclear technology is substantial, and should not be ignored. ¶ To return to the problem posed by Brian Wang, the problem of lower Asian nuclear construction costs. If Europe and the United States cannot meet the Asican energy cost challenge, their economies will encounter a significant decline. Because of Labor cost advantages, it is unlikely that Generation III nuclear plants will ever cost less to build in the United States or Europe than in Asia. in order to keep the American and European economies competitive, the United States and Europe must adopt a low cost, factory manufactured nuclear technology. Molten Salt nuclear technology represents the lowest cost approach, and is highly consistent with factory manufacture and other cost lowering approaches. Couple to that the outstanding safety of molten salt nuclear technology, the potential for dramatically lowering the creation of nuclear waste, and the obsticles to nuclear proliferation posed by molten salt nuclear rechnology, and we see a real potential for keeping the American and European economies competitive, at least as far as energy costs are concerned.

#### That prevents great power wars – perception is key

**Baru 9** - Visiting Professor at the Lee Kuan Yew School of Public Policy in Singapore (Sanjaya, “Year of the power shift?,”

http://www.india-seminar.com/2009/593/593\_sanjaya\_baru.htm

**T**here is no doubt that economics alone will not determine the balance of global power, but there is no doubt either that economics has come to matter for more.¶ The management of the economy, and of the treasury, has been a vital aspect of statecraft from time immemorial. Kautilya’s *Arthashastra* says, ‘From the strength of the treasury the army is born. …men without wealth do not attain their objectives even after hundreds of trials… Only through wealth can material gains be acquired, as elephants (wild) can be captured only by elephants (tamed)… A state with depleted resources, even if acquired, becomes only a liability.’4 Hence, economic policies and performance do have strategic consequences.5¶ In the modern era, the idea that strong economic performance is the foundation of power was argued most persuasively by historian Paul Kennedy. ‘Victory (in war),’ Kennedy claimed, ‘has repeatedly gone to the side with more flourishing productive base.’6 Drawing attention to the interrelationships between economic wealth, technological innovation, and the ability of states to efficiently mobilize economic and technological resources for power projection and national defence, Kennedy argued that nations that were able to better combine military and economic strength scored over others.¶ ‘The fact remains,’ Kennedy argued, ‘that all of the major shifts in the world’s *military-power* balance have followed alterations in the *productive* balances; and further, that the rising and falling of the various empires and states in the international system has been confirmed by the outcomes of the major Great Power wars, where victory has always gone to the side with the greatest material resources.’7¶ **I**n Kennedy’s view the geopolitical consequences of an economic crisis or even decline would be transmitted through a nation’s inability to find adequate financial resources to simultaneously sustain economic growth and military power – the classic ‘guns vs butter’ dilemma.¶ Apart from such fiscal disempowerment of the state, economic under-performance would also reduce a nation’s attraction as a market, a source of capital and technology, and as a ‘knowledge power’. As power shifted from Europe to America, so did the knowledge base of the global economy. As China’s power rises, so does its profile as a ‘knowledge economy’.¶ Impressed by such arguments the China Academy of Social Sciences developed the concept of Comprehensive National Power (CNP) to get China’s political and military leadership to focus more clearly on economic and technological performance than on military power alone in its quest for Great Power status.8¶ While China’s impressive economic performance and the consequent rise in China’s global profile has forced strategic analysts to acknowledge this link, the recovery of the US economy in the 1990s had reduced the appeal of the Kennedy thesis in Washington DC. We must expect a revival of interest in Kennedy’s arguments in the current context.¶ **A** historian of power who took Kennedy seriously, Niall Ferguson, has helped keep the focus on the geopolitical implications of economic performance. In his masterly survey of the role of finance in the projection of state power, Ferguson defines the ‘square of power’ as the tax bureaucracy, the parliament, the national debt and the central bank. These four institutions of ‘fiscal empowerment’ of the state enable nations to project power by mobilizing and deploying financial resources to that end.9 ¶ Ferguson shows how vital sound economic management is to strategic policy and national power. More recently, Ferguson has been drawing a parallel between the role of debt and financial crises in the decline of the Ottoman and Soviet empires and that of the United States of America. In an early comment on the present financial crisis, Ferguson wrote:¶ ‘We are indeed living through a global shift in the balance of power very similar to that which occurred in the 1870s. This is the story of how an over-extended empire sought to cope with an external debt crisis by selling off revenue streams to foreign investors. The empire that suffered these setbacks in the 1870s was the Ottoman empire. Today it is the US… It remains to be seen how quickly today’s financial shift will be followed by a comparable geopolitical shift in favour of the new export and energy empires of the east. Suffice to say that the historical analogy does not bode well for America’s quasi-imperial network of bases and allies across the Middle East and Asia. Debtor empires sooner or later have to do more than just sell shares to satisfy their creditors*. …*as in the 1870s the balance of financial power is shifting. Then, the move was from the ancient Oriental empires (not only the Ottoman but also the Persian and Chinese) to Western Europe. Today the shift is from the US – and other western financial centres – to the autocracies of the Middle East and East Asia.’10 ¶ An economic or financial crisis may not trigger the decline of an empire. It can certainly speed up a process already underway. In the case of the Soviet Union the financial crunch caused by the Afghan war came on top of years of economic under-performance and the loss of political legitimacy of the Soviet state. In a democratic society like the United States the political legitimacy of the state is constantly renewed through periodic elections. Thus, the election of Barack Obama may serve to renew the legitimacy of the state and by doing so enable the state to undertake measures that restore health to the economy. This the Soviet state was unable to do under Gorbachev even though he repudiated the Brezhnev legacy and distanced himself from it.¶ Hence, one must not become an economic determinist and historic parallels need not always be relevant. Politics can intervene and offer solutions. Political economy and politics, in the form of Keynesian economics and the ‘New Deal’, did intervene to influence the geopolitical implications of the Great Depression. Whether they will do so once again in today’s America remains to be seen.

#### Independently key to heg

**Gelb, 10** - currently president emeritus of the Council on Foreign Relations, (Leslie, Fashioning a Realistic Strategy for the Twenty-First Century,” Fletcher Forum of World Affairs vol.34:2 summer 2010 http://fletcher.tufts.edu/forum/archives/pdfs/34-2pdfs/Gelb.pdf)

**LESLIE H. GELB:** Power is what it always has been. It is the ability to get someone to do something they do not want to do by means of your resources and your position. It was always that. There is no such thing in my mind as “soft” power or “hard” power or “smart” power or “dumb” power. It is people who are hard or soft or smart or dumb. Power is power. And people use it wisely or poorly. Now, what has changed is the composition of power in international affairs. For almost all of history, international power was achieved in the form of military power and military force. Now, particularly in the last fifty years or so, it has become more and more economic. So power consists of economic power, military power, and diplomatic power, but the emphasis has shifted from military power (for almost all of history) to now, more economic power. And, as President Obama said in his West Point speech several months ago, our economy is the basis of our international power in general and our military power in particular. That is where it all comes from. Whether other states listen to us and act on what we say depends a good deal on their perception of the strength of the American economy. A big problem for us in the last few years has been the perception that our economy is in decline.

#### Heg solves extinction

**Barnett 2011** – Former Senior Strategic Researcher and Professor in the Warfare Analysis & Research Department, Center for Naval Warfare Studies, U.S. Naval War College, worked as the Assistant for Strategic Futures in the Office of Force Transformation in the DOD (3/7, Thomas, World Politics Review, “The New Rules: Leadership Fatigue Puts U.S., and Globalization, at Crossroads”, <http://www.worldpoliticsreview.com/articles/8099/the-new-rules-leadership-fatigue-puts-u-s-and-globalization-at-crossroads>, credit to LDK)

Events in Libya are a further reminder for Americans that we stand at a crossroads in our continuing evolution as the world's sole full-service superpower. Unfortunately, we are increasingly seeking change without cost, and shirking from risk because we are tired of the responsibility. We don't know who we are anymore, and our president is a big part of that problem. Instead of leading us, he explains to us. Barack Obama would have us believe that he is practicing strategic patience. But many experts and ordinary citizens alike have concluded that he is actually beset by strategic incoherence -- in effect, a man overmatched by the job.  It is worth first examining the larger picture: We live in a time of arguably the greatest structural change in the global order yet endured, with this historical moment's most amazing feature being its relative and absolute lack of mass violence. That is something to consider when Americans contemplate military intervention in Libya, because if we do take the step to prevent larger-scale killing by engaging in some killing of our own, we will not be adding to some fantastically imagined global death count stemming from the ongoing "megalomania" and "evil" of American "empire." We'll be engaging in the same sort of system-administering activity that has marked our stunningly successful stewardship of global order since World War II.  Let me be more blunt: As the guardian of globalization, the U.S. military has been the greatest force for peace the world has ever known. Had America been removed from the global dynamics that governed the 20th century, the mass murder never would have ended. Indeed, it's entirely conceivable there would now be no identifiable human civilization left, once nuclear weapons entered the killing equation.  But the world did not keep sliding down that path of perpetual war. Instead, America stepped up and changed everything by ushering in our now-perpetual great-power peace. We introduced the international liberal trade order known as globalization and played loyal Leviathan over its spread. What resulted was the collapse of empires, an explosion of democracy, the persistent spread of human rights, the liberation of women, the doubling of life expectancy, a roughly 10-fold increase in adjusted global GDP and a profound and persistent reduction in battle deaths from state-based conflicts.

### Warming adv

#### Warming is real and anthropogenic – carbon dioxide increase, polar ice records, melting glaciers, sea level rise

**Prothero 12** [Donald R. Prothero, Professor of Geology at Occidental College and Lecturer in Geobiology at the California Institute of Technology, 3-1-2012, "How We Know Global Warming is Real and Human Caused," Skeptic, vol 17 no 2, EBSCO]

Converging Lines of Evidence¶ How do we know that global warming is real and primarily human caused? There are numerous lines of evidence that converge toward this conclusion.¶ 1. Carbon Dioxide Increase.¶ Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Little Ice Age in die 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, die timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil.¶ 2. Melting Polar Ice Caps.¶ The polar icecaps are thinning and breaking up at an alarming rate. In 2000, my former graduate advisor Malcolm McKenna was one of the first humans to fly over the North Pole in summer time and see no ice, just open water. The Arctic ice cap has been frozen solid for at least the past 3 million years (and maybe longer),4 but now the entire ice sheet is breaking up so fast that by 2030 (and possibly sooner) less than half of the Arctic will be ice covered in the summer.5 As one can see from watching the news, this is an ecological disaster for everything that lives up there, from the polar bears to the seals and walruses to the animals they feed upon, to the 4 million people whose world is melting beneath their feet. The Antarctic is thawing even faster. In February-March 2002, the Larsen B ice shelf - over 3000 square km (the size of Rhode Island) and 220 m (700 feet) thick- broke up in just a few months, a story typical of nearly all the ice shelves in Antarctica. The Larsen B shelf had survived all the previous ice ages and interglacial warming episodes over the past 3 million years, and even the warmest periods of the last 10,000 years- yet it and nearly all the other thick ice sheets on the Arctic, Greenland, and Antarctic are vanishing at a rate never before seen in geologic history.¶ 3. Melting Glaciers.¶ Glaciers are all retreating at the highest rates ever documented. Many of those glaciers, along with snow melt, especially in the Himalayas, Andes, Alps, and Sierras, provide most of the freshwater that the populations below the mountains depend upon - yet this fresh water supply is vanishing. Just think about the percentage of world's population in southern Asia (especially India) that depend on Himalayan snowmelt for their fresh water. The implications are staggering. The permafrost that once remained solidly frozen even in the summer has now Üiawed, damaging the Inuit villages on the Arctic coast and threatening all our pipelines to die North Slope of Alaska. This is catastrophic not only for life on the permafrost, but as it thaws, the permafrost releases huge amounts of greenhouse gases which are one of the major contributors to global warming. Not only is the ice vanishing, but we have seen record heat waves over and over again, killing thousands of people, as each year joins the list of the hottest years on record. (2010 just topped that list as the hottest year, surpassing the previous record in 2009, and we shall know about 2011 soon enough). Natural animal and plant populations are being devastated all over the globe as their environments change.6 Many animals respond by moving their ranges to formerly cold climates, so now places that once did not have to worry about disease-bearing mosquitoes are infested as the climate warms and allows them to breed further north.¶ 4. Sea Level Rise.¶ All that melted ice eventually ends up in the ocean, causing sea levels to rise, as it has many times in the geologic past. At present, the sea level is rising about 3-4 mm per year, more than ten times the rate of 0.10.2 mm/year that has occurred over the past 3000 years. Geological data show Üiat ttie sea level was virtually unchanged over the past 10,000 years since the present interglacial began. A few mm here or there doesn't impress people, until you consider that the rate is accelerating and that most scientists predict sea levels will rise 80-130 cm in just the next century. A sea level rise of 1.3 m (almost 4 feet) would drown many of the world's low-elevation cities, such as Venice and New Orleans, and low-lying countries such as the Netherlands or Bangladesh. A number of tiny island nations such as Vanuatu and the Maldives, which barely poke out above the ocean now, are already vanishing beneath the waves. Eventually their entire population will have to move someplace else.7 Even a small sea level rise might not drown all these areas, but they are much more vulnerable to the large waves of a storm surge (as happened with Hurricane Katrina), which could do much more damage than sea level rise alone. If sea level rose by 6 m (20 feet), most of die world's coastal plains and low-lying areas (such as the Louisiana bayous, Florida, and most of the world's river deltas) would be drowned.¶ Most of the world's population lives in lowelevation coastal cities such as New York, Boston, Philadelphia, Baltimore, Washington, D.C., Miami, and Shanghai. All of those cities would be partially or completely under water with such a sea level rise. If all the glacial ice caps melted completely (as they have several times before during past greenhouse episodes in the geologic past), sea level would rise by 65 m (215 feet)! The entire Mississippi Valley would flood, so you could dock an ocean liner in Cairo, Illinois. Such a sea level rise would drown nearly every coastal region under hundreds of feet of water, and inundate New York City, London and Paris. All that would remain would be the tall landmarks such as the Empire State Building, Big Ben, and the Eiffel Tower. You could tie your boats to these pinnacles, but the rest of these drowned cities would lie deep underwater.

#### Worst-case warming results in extinction

Ahmed 2010 (Nafeez Ahmed, Executive Director of the Institute for Policy Research and Development, professor of International Relations and globalization at Brunel University and the University of Sussex, Spring/Summer 2010, “Globalizing Insecurity: The Convergence of Interdependent Ecological, Energy, and Economic Crises,” Spotlight on Security, Volume 5, Issue 2, online)

Perhaps the most notorious indicator is anthropogenic global warmings warming. The landmark 2007 Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change (IPCC) – which warned that at then-current rates of increase of fossil fuel emissions, the earth’s global average temperature would likely rise by 6°C by the end of the 21st century creating a largely uninhabitable planet – was a wake-up call to the international community.[v] Despite the pretensions of ‘climate sceptics,’ the peer-reviewed scientific literature has continued to produce evidence that the IPCC’s original scenarios were wrong – not because they were too alarmist, but on the contrary, because they were far too conservative. According to a paper in the Proceedings of the National Academy of Sciences, current CO2 emissions are worse than all six scenarios contemplated by the IPCC. This implies that the IPCC’s worst-case six-degree scenario severely underestimates the most probable climate trajectory under current rates of emissions.[vi] It is often presumed that a 2°C rise in global average temperatures under an atmospheric concentration of greenhouse gasses at 400 parts per million (ppm) constitutes a safe upper limit – beyond which further global warming could trigger rapid and abrupt climate changes that, in turn, could tip the whole earth climate system into a process of irreversible, runaway warming.[vii] Unfortunately, we are already well past this limit, with the level of greenhouse gasses as of mid-2005 constituting 445 ppm.[viii] Worse still, cutting-edge scientific data suggests that the safe upper limit is in fact far lower. James Hansen, director of the NASA Goddard Institute for Space Studies, argues that the absolute upper limit for CO2 emissions is 350 ppm: “If the present overshoot of this target CO2 is not brief, there is a possibility of seeding irreversible catastrophic effects.”[ix] A wealth of scientific studies has attempted to explore the role of positive-feedback mechanisms between different climate sub-systems, the operation of which could intensify the warming process. Emissions beyond 350 ppm over decades are likely to lead to the total loss of Arctic sea-ice in the summer triggering magnified absorption of sun radiation, accelerating warming; the melting of Arctic permafrost triggering massive methane injections into the atmosphere, accelerating warming; the loss of half the Amazon rainforest triggering the momentous release of billions of tonnes of stored carbon, accelerating warming; and increased microbial activity in the earth’s soil leading to further huge releases of stored carbon, accelerating warming; to name just a few. Each of these feedback sub-systems alone is sufficient by itself to lead to irreversible, catastrophic effects that could tip the whole earth climate system over the edge.[x] Recent studies now estimate that the continuation of business-as-usual would lead to global warming of three to four degrees Celsius before 2060 with multiple irreversible, catastrophic impacts; and six, even as high as eight, degrees by the end of the century – a situation endangering the survival of all life on earth.[xi]

#### Warming causes extinction

**Sify 2010 –** Sydney newspaper citing Ove Hoegh-Guldberg, professor at University of Queensland and Director of the Global Change Institute, and John Bruno, associate professor of Marine Science at UNC (Sify News, “Could unbridled climate changes lead to human extinction?”, <http://www.sify.com/news/could-unbridled-climate-changes-lead-to-human-extinction-news-international-kgtrOhdaahc.html>, WEA)

The findings of the comprehensive report: 'The impact of climate change on the world's marine ecosystems' emerged from a synthesis of recent research on the world's oceans, carried out by two of the world's leading marine scientists. One of the authors of the report is Ove Hoegh-Guldberg, professor at The University of Queensland and the director of its Global Change Institute (GCI). 'We may see sudden, unexpected changes that have serious ramifications for the overall well-being of humans, including the capacity of the planet to support people. This is further evidence that we are well on the way to the next great extinction event,' says Hoegh-Guldberg. 'The findings have enormous implications for mankind, particularly if the trend continues. The earth's ocean, which produces half of the oxygen we breathe and absorbs 30 per cent of human-generated carbon dioxide, is equivalent to its heart and lungs. This study shows worrying signs of ill-health. It's as if the earth has been smoking two packs of cigarettes a day!,' he added. 'We are entering a period in which the ocean services upon which humanity depends are undergoing massive change and in some cases beginning to fail', he added. The 'fundamental and comprehensive' changes to marine life identified in the report include rapidly warming and acidifying oceans, changes in water circulation and expansion of dead zones within the ocean depths. These are driving major changes in marine ecosystems: less abundant coral reefs, sea grasses and mangroves (important fish nurseries); fewer, smaller fish; a breakdown in food chains; changes in the distribution of marine life; and more frequent diseases and pests among marine organisms. Study co-author John F Bruno, associate professor in marine science at The University of North Carolina, says greenhouse gas emissions are modifying many physical and geochemical aspects of the planet's oceans, in ways 'unprecedented in nearly a million years'. 'This is causing fundamental and comprehensive changes to the way marine ecosystems function,' Bruno warned, according to a GCI release. These findings were published in Science

#### The IFR is the only way to reduce coal emissions sufficiently to avert the worst climate disasters

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "Why We Should Build an Integral Fast Reactor Now," 11/25/9) http://skirsch.wordpress.com/2009/11/25/ifr/

To prevent a climate disaster, we must eliminate virtually all coal plant emissions worldwide in 25 years. The best way and, for all practical purposes, the only way to get all countries off of coal is not with coercion; it is to make them want to replace their coal burners by giving them a plug-compatible technology that is less expensive. The IFR can do this. It is plug-compatible with the burners in a coal plant (see Nuclear Power: Going Fast). No other technology can upgrade a coal plant so it is greenhouse gas free while reducing operating costs at the same time. In fact, no other technology can achieve either of these goals. The IFR can achieve both.¶ The bottom line is that without the IFR (or a yet-to-be-invented technology with similar ability to replace the coal burner with a cheaper alternative), it is unlikely that we’ll be able to keep CO2 under 450 ppm.¶ Today, the IFR is the only technology with the potential to displace the coal burner. That is why restarting the IFR is so critical and why Jim Hansen has listed it as one of the top five things we must do to avert a climate disaster.[4]¶ Without eliminating virtually all coal emissions by 2030, the sum total of all of our other climate mitigation efforts will be inconsequential. Hansen often refers to the near complete phase-out of carbon emissions from coal plants worldwide by 2030 as the sine qua non for climate stabilization (see for example, the top of page 6 in his August 4, 2008 trip report).¶ To stay under 450ppm, we would have to install about 13,000 GWe of new carbon-free power over the next 25 years. That number was calculated by Nathan Lewis of Caltech for the Atlantic, but others such as Saul Griffith have independently derived a very similar number and White House Science Advisor John Holdren used 5,600 GWe to 7,200 GWe in his presentation to the Energy Bar Association Annual Meeting on April 23, 2009. That means that if we want to save the planet, we must install more than 1 GWe per day of clean power every single day for the next 25 years. That is a very, very tough goal. It is equivalent to building one large nuclear reactor per day, or 1,500 huge wind turbines per day, or 80,000 37 foot diameter solar dishes covering 100 square miles every day, or some linear combination of these or other carbon free power generation technologies. Note that the required rate is actually higher than this because Hansen and Rajendra Pachauri, the chair of the IPCC, now both agree that 350ppm is a more realistic “not to exceed” number (and we’ve already exceeded it).¶ Today, we are nowhere close to that installation rate with renewables alone. For example, in 2008, the average power delivered by solar worldwide was only 2 GWe (which is to be distinguished from the peak solar capacity of 13.4GWe). That is why every renewable expert at the 2009 Aspen Institute Environment Forum agreed that nuclear must be part of the solution. Al Gore also acknowledges that nuclear must play an important role.¶ Nuclear has always been the world’s largest source of carbon free power. In the US, for example, even though we haven’t built a new nuclear plant in the US for 30 years, nuclear still supplies 70% of our clean power!¶ Nuclear can be installed very rapidly; much more rapidly than renewables. For example, about two thirds of the currently operating 440 reactors around the world came online during a 10 year period between 1980 and 1990. So our best chance of meeting the required installation of new power goal and saving the planet is with an aggressive nuclear program.¶ Unlike renewables, nuclear generates base load power, reliably, regardless of weather. Nuclear also uses very little land area. It does not require the installation of new power lines since it can be installed where the power is needed. However, even with a very aggressive plan involving nuclear, it will still be extremely difficult to install clean power fast enough.¶ Unfortunately, even in the US, we have no plan to install the clean power we need fast enough to save the planet. Even if every country were to agree tomorrow to completely eliminate their coal plant emissions by 2030, how do we think they are actually going to achieve that? There is no White House plan that explains this. There is no DOE plan. There is no plan or strategy. The deadlines will come and go and most countries will profusely apologize for not meeting their goals, just like we have with most of the signers of the Kyoto Protocol today. Apologies are nice, but they will not restore the environment.¶ We need a strategy that is believable, practical, and affordable for countries to adopt. The IFR offers our best hope of being a centerpiece in such a strategy because it the only technology we know of that can provide an economically compelling reason to change.¶ At a speech at MIT on October 23, 2009, President Obama said “And that’s why the world is now engaged in a peaceful competition to determine the technologies that will power the 21st century. … The nation that wins this competition will be the nation that leads the global economy. I am convinced of that. And I want America to be that nation, it’s that simple.”¶ Nuclear is our best clean power technology and the IFR is our best nuclear technology. The Gen IV International Forum (GIF) did a study in 2001-2002 of 19 different reactor designs on 15 different criteria and 24 metrics. The IFR ranked #1 overall. Over 242 experts from around the world participated in the study. It was the most comprehensive evaluation of competitive nuclear designs ever done. Top DOE nuclear management ignored the study because it didn’t endorse the design the Bush administration wanted.¶ The IFR has been sitting on the shelf for 15 years and the DOE currently has no plans to change that.¶ How does the US expect to be a leader in clean energy by ignoring our best nuclear technology? Nobody I’ve talked to has been able to answer that question.¶ We have the technology (it was running for 30 years before we were ordered to tear it down). And we have the money: The Recovery Act has $80 billion dollars. Why aren’t we building a demo plant?¶ IFRs are better than conventional nuclear in every dimension. Here are a few:¶ Efficiency: IFRs are over 100 times more efficient than conventional nuclear. It extracts nearly 100% of the energy from nuclear material. Today’s nuclear reactors extract less than 1%. So you need only 1 ton of actinides each year to feed an IFR (we can use existing nuclear waste for this), whereas you need 100 tons of freshly mined uranium each year to extract enough material to feed a conventional nuclear plant.¶ Unlimited power forever: IFRs can use virtually any actinide for fuel. Fast reactors with reprocessing are so efficient that even if we restrict ourselves to just our existing uranium resources, we can power the entire planet forever (the Sun will consume the Earth before we run out of material to fuel fast reactors). If we limited ourselves to using just our DU “waste” currently in storage, then using the IFR we can power the US for over 1,500 years without doing any new mining of uranium.[5]¶ Exploits our largest energy resource: In the US, there is 10 times as much energy in the depleted uranium (DU) that is just sitting there as there is coal in the ground. This DU waste is our largest natural energy resource…but only if we have fast reactors. Otherwise, it is just waste. With fast reactors, virtually all our nuclear waste (from nuclear power plants, leftover from enrichment, and from decommissioned nuclear weapons)[6] becomes an energy asset worth about $30 trillion dollars…that’s not a typo…$30 trillion, not billion.[7] An 11 year old child was able to determine this from publicly available information in 2004.

#### Inventing something cheaper is key – alternative methods can’t solve warming

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "How Does Obama Expect to Solve the Climate Crisis Without a Plan?" 7/16/9) [http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html-http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html](http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html-http%3A//www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html)

The ship is sinking slowly and we are quickly running out of time to develop and implement any such plan if we are to have any hope of saving the planet. What we need is a plan we can all believe in. A plan where our country's smartest people all nod their heads in agreement and say, "Yes, this is a solid, viable plan for keeping CO2 levels from touching 425ppm and averting a global climate catastrophe."¶ ¶ At his Senate testimony a few days ago, noted climate scientist James Hansen made it crystal clear once again that the only way to avert an irreversible climate meltdown and save the planet is to phase out virtually all coal plants worldwide over a 20 year period from 2010 to 2030. Indeed, if we don't virtually eliminate the use of coal worldwide, everything else we do will be as effective as re-arranging deck chairs on the Titanic.¶ ¶ Plans that won't work¶ ¶ Unfortunately, nobody has proposed a realistic and practical plan to eliminate coal use worldwide or anywhere close to that. There is no White House URL with such a plan. No environmental group has a workable plan either.¶ ¶ Hoping that everyone will abandon their coal plants and replace them with a renewable power mix isn't a viable strategy -- we've proven that in the U.S. Heck, even if the Waxman-Markey bill passes Congress (a big "if"), it is so weak that it won't do much at all to eliminate coal plants. So even though we have Democrats controlling all three branches of government, it is almost impossible to get even a weak climate bill passed.¶ ¶ If we can't pass strong climate legislation in the U.S. with all the stars aligned, how can we expect anyone else to do it? So expecting all countries to pass a 100% renewable portfolio standard (which is far far beyond that contemplated in the current energy bill) just isn't possible. Secondly, even if you could mandate it politically in every country, from a practical standpoint, you'd never be able to implement it in time. And there are lots of experts in this country, including Secretary Chu, who say it's impossible without nuclear (a point which I am strongly in agreement with).¶ ¶ Hoping that everyone will spontaneously adopt carbon capture and sequestration (CCS) is also a non-starter solution. First of all, CCS doesn't exist at commercial scale. Secondly, even if we could make it work at scale, and even it could be magically retrofitted on every coal plant (which we don't know how to do), it would require all countries to agree to add about 30% in extra cost for no perceivable benefit. At the recent G8 conference, India and China have made it clear yet again that they aren't going to agree to emission goals.¶ ¶ Saying that we'll invent some magical new technology that will rescue us at the last minute is a bad solution. That's at best a poor contingency plan.¶ ¶ The point is this: It should be apparent to us that we aren't going to be able to solve the climate crisis by either "force" (economic coercion or legislation) or by international agreement. And relying on technologies like CCS that may never work is a really bad idea.¶ ¶ The only remaining way to solve the crisis is to make it economically irresistible for countries to "do the right thing." The best way to do that is to give the world a way to generate electric power that is economically more attractive than coal with the same benefits as coal (compact power plants, 24x7 generation, can be sited almost anywhere, etc). Even better is if the new technology can simply replace the existing burner in a coal plant. That way, they'll want to switch. No coercion is required.

#### IFRs solve massive energy and overpopulation crunches that spark resource wars and water scarcity – no alternatives can solve

**Blees et al 11** (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/

The global threat of anthropogenic climate change has become a political hot potato, especially in the USA. The vast majority of climate scientists, however, are in agreement that the potential consequences of inaction are dire indeed. Yet even those who dismiss concerns about climate change cannot discount an array of global challenges facing humanity that absolutely must be solved if wars, dislocations, and social chaos are to be avoided.¶ Human population growth exacerbates a wide range of problems, and with most demographic projections predicting an increase of about 50% to nine or ten billion by mid-century, we are confronted with a social and logistical dilemma of staggering proportions. The most basic human morality dictates that we attempt to solve these problems without resorting to forcible and draconian methods. At the same time, simple social justice demands that the developed world accept the premise that the billions who live today in poverty deserve a drastic improvement in their standard of living, an improvement that is being increasingly demanded and expected throughout the developing countries. To achieve environmental sustainability whilst supporting human well-being will require a global revolution in energy and materials technology and deployment fully as transformative as the Industrial Revolution, but unlike that gradual process we find ourselves under the gun, especially if one considers climate change, peak oil and other immediate sustainability problems to be bona fide threats.¶ It is beyond the purview of this paper to address the question of materials disposition and recycling [i], or the social transformations that will necessarily be involved in confronting the challenges of the next several decades. But the question of energy supply is inextricably bound up with the global solution to our coming crises. It may be argued that energy is the most crucial aspect of any proposed remedy. Our purpose here is to demonstrate that the provision of all the energy that humankind can possibly require to meet the challenges of the coming decades and centuries is a challenge that already has a realistic solution, using technology that is just waiting to be deployed.¶ Energy Realism¶ The purpose of this paper is not to exhaustively examine the many varieties of energy systems currently in use, in development, or in the dreams of their promoters. Nevertheless, because of the apparent passion of both the public and policymakers toward certain energy systems and the political influence of their advocates, a brief discussion of “renewable” energy systems is in order. Our pressing challenges make the prospect of heading down potential energy cul de sacs – especially to the explicit exclusion of nuclear fission alternatives – to be an unconscionable waste of our limited time and resources.¶ There is a vocal contingent of self-styled environmentalists who maintain that wind and solar power—along with other technologies such as wave and tidal power that have yet to be meaningfully developed—can (and should) provide all the energy that humanity demands. The more prominent names are well-known among those who deal with these issues: Amory Lovins, Lester Brown and Arjun Makhijani are three in particular whose organizations wield considerable clout with policymakers. The most recent egregious example to make a public splash, however, was a claim trumpeted with a cover story in Scientific American that all of our energy needs can be met by renewables (predominantly ‘technosolar’ – wind and solar thermal) by 2030. The authors of this piece—Mark Jacobson (Professor, Stanford) and Mark A. Delucchi (researcher, UC Davis)—were roundly critiqued [ii] online and in print.¶ An excellent treatment of the question of renewables’ alleged capacity to provide sufficient energy is a book by David MacKay [iii] called Sustainable Energy – Without the Hot Air. [iv] MacKay was a professor of physics at Cambridge before being appointed Chief Scientific Advisor to the Department of Energy and Climate Change in the UK. His book is a model of scientific and intellectual rigor.¶ Energy ideologies can be every bit as fervent as those of religion, so after suggesting Dr. MacKay’s book as an excellent starting point for a rational discussion of energy systems we’ll leave this necessary digression with a point to ponder. Whatever one believes about the causes of climate change, there is no denying that glaciers around the world are receding at an alarming rate. Billions of people depend on such glaciers for their water supplies. We have already seen cases of civil strife and even warfare caused or exacerbated by competition over water supplies. Yet these are trifling spats when one considers that the approaching demographic avalanche will require us to supply about three billion more people with all the water they need within just four decades.¶ There is no avoiding the fact that the water for all these people—and even more, if the glaciers continue to recede, as expected—will have to come from the ocean. That means a deployment of desalination facilities on an almost unimaginable scale. Not only will it take staggering amounts of energy just to desalinate such a quantity, but moving the water to where it is needed will be an additional energy burden of prodigious proportions. A graphic example can be seen in the case of California, its state water project being the largest single user of energy in California. It consumes an average of 5 billion kWh/yr, more than 25% of the total electricity consumption of the entire state of New Mexico [v].¶ Disposing of the salt derived from such gargantuan desalination enterprises will likewise take a vast amount of energy. Even the relatively modest desalination projects along the shores of the Persian Gulf have increased its salinity to the point of serious concern. Such circumscribed bodies of water simply won’t be available as dumping grounds for the mountains of salt that will be generated, and disposing of it elsewhere will require even more energy to move and disperse it. Given the formidable energy requirements for these water demands alone, any illusions about wind turbines and solar panels being able to supply all the energy humanity requires should be put to rest.¶ Energy Density and Reliability¶ Two of the most important qualities of fossil fuels that enabled their rise to prominence in an industrializing world is their energy density and ease of storage. High energy density and a stable and convenient long-term fuel store are qualities that makes it practical and economical to collect, distribute, and then use them on demand for the myriad of uses to which we put them. This energy density, and the dispatchability that comes from having a non-intermittent fuel source, are the very things lacking in wind and solar and other renewable energy systems, yet they are crucial factors in considering how we can provide reliable on-demand power for human society.¶ The supply of fossil fuels is limited, although the actual limits of each different type are a matter of debate and sometimes change substantially with new technological developments, as we’ve seen recently with the adoption of hydraulic fracturing (fracking) methods to extract natural gas from previously untapped subterranean reservoirs. The competition for fossil fuel resources, whatever their limitations, has been one of the primary causes of wars in the past few decades and can be expected to engender further conflicts and other symptoms of international competition as countries like India and China lead the developing nations in seeking a rising standard of living for their citizens. Even disregarding the climatological imperative to abandon fossil fuels, the economic, social, and geopolitical upheavals attendant upon a continuing reliance on such energy sources demands an objective look at the only other energy-dense and proven resource available to us: nuclear power.¶ We will refrain from discussing the much hoped-for chimera of nuclear fusion as the magic solution to all our energy needs, since it is but one of many technologies that have yet to be harnessed. Our concern here is with technologies that we know will work, so when it comes to harnessing the power of the atom we are confined to nuclear fission. The splitting of uranium and transuranic elements in fission-powered nuclear reactors is a potent example of energy density being tapped for human uses. Reactor-grade uranium (i.e. uranium enriched to about 3.5% U-235) is over 100,000 times more energy-dense than anthracite coal, the purest form of coal used in power generation, and nearly a quarter-million times as much as lignite, the dirty coal used in many power plants around the world. Ironically, one of the world’s largest producers and users of lignite is Germany, the same country whose anti-nuclear political pressure under the banner of environmentalism is globally infamous.¶ The vast majority of the world’s 440 commercial nuclear power plants are light-water reactors (LWRs) that use so-called enriched uranium (mentioned above). Natural uranium is comprised primarily of two isotopes: U-235 and U-238. The former comprises only 0.7% of natural uranium, with U-238 accounting for the remaining 99.3%. LWR technology requires a concentration of at least 3.5% U-235 in order to maintain the chain reaction used to extract energy, so a process called uranium enrichment extracts as much of the U-235 as possible from several kilos of natural uranium and adds it to a fuel kilo in order to reach a concentration high enough to enable the fission process. Because current enrichment technology is capable of harvesting only some of the U-235, this results in about 8-10 kilos of “depleted uranium” (DU) for every kilo of power plant fuel (some of which is enriched to 4% or more, depending on plant design). The USA currently has (largely unwanted) stockpiles of DU in excess of half a million tons, while other countries around the world that have been employing nuclear power over the last half-century have their own DU inventories.¶ Technological advances in LWR engineering have resulted in new power plants that are designated within the industry as Generation III or III+ designs, to differentiate them from currently-used LWRs normally referred to as Gen II plants. The European Pressurized Reactor (EPR), currently being built by AREVA in Finland, France and China, is an example of a Gen III design. It utilizes multiple-redundant engineered systems to assure safety and dependability. Two examples of Gen III+ designs are the Westinghouse/Toshiba AP-1000, now being built in China, and GE/Hitachi’s Economic Simplified Boiling Water Reactor (ESBWR), expected to be certified for commercial use by the U.S. Nuclear Regulatory Commission by the end of 2011. The distinguishing feature of Gen III+ designs is their reliance on the principle of passive safety, which would allow the reactor to automatically shut down in the event of an emergency without operator action or electronic feedback, due to inherent design properties. Relying as they do on the laws of physics rather than active intervention to intercede, they consequently can avoid the necessity for several layers of redundant systems while still maintaining ‘defense in depth’, making it possible to build them both faster and cheaper than Gen III designs—at least in theory. As of this writing we are seeing this playing out in Finland and China. While it is expected that first-of-a-kind difficulties (and their attendant costs) will be worked out so that future plants will be cheaper and faster to build, the experience to date seems to validate the Gen III+ concept. Within a few years both the EPR and the first AP-1000s should be coming online, as well as Korean, Russian and Indian designs, at which point actual experience will begin to tell the tale as subsequent plants are built.¶ The safety and economics of Gen III+ plants seem to be attractive enough to consider this generation of nuclear power to provide reasons for optimism that humanity can manage to provide the energy needed for the future. But naysayers are warning (with highly questionable veracity) about uranium shortages if too many such plants are built. Even if they’re right, the issue can be considered moot, for there is another player waiting in the wings that is so superior to even Gen III+ technology as to render all concerns about nuclear fuel shortages baseless.¶ The Silver Bullet¶ In the endless debate on energy policy and technology that seems to increase by the day, the phrase heard repeatedly is “There is no silver bullet.” (This is sometimes rendered “There is no magic bullet”, presumably by those too young to remember the Lone Ranger TV series.) Yet a fission technology known as the integral fast reactor (IFR), developed at Argonne National Laboratory in the 80s and 90s, gives the lie to that claim.¶ Below is a graph [vi] representing the number of years that each of several power sources would be able to supply all the world’s expected needs if they were to be relied upon as the sole source of humanity’s energy supply. The categories are described thusly:¶ Conventional oil: ordinary oil drilling and extraction as practiced today¶ Conventional gas: likewise¶ Unconventional oil (excluding low-grade oil shale). More expensive methods of recovering oil from more problematic types of deposits¶ Unconventional gas (excluding clathrates and geopressured gas): As with unconventional oil, this encompasses more costly extraction techniques¶ Coal: extracted with techniques in use today. The worldwide coal estimates, however, are open to question and may, in fact, be considerably less than they are ordinarily presented to be, unless unconventional methods like underground in situ gasification are deployed. [vii]¶ Methane Clathrates & Geopressured Gas: These are methane resources that are both problematic and expensive to recover, with the extraction technology for clathrates only in the experimental stage.¶ Low-grade oil shale and sands: Very expensive to extract and horrendously destructive of the environment. So energy-intensive that there have been proposals to site nuclear power plants in the oil shale and tar sands areas to provide the energy for extraction!¶ Uranium in fast breeder reactors (IFRs being the type under discussion here) Integral fast reactors can clearly be seen as the silver bullet that supposedly doesn’t exist. The fact is that IFRs can provide all the energy that humanity requires, and can deliver it cleanly, safely, and economically. This technology is a true game changer.

#### Resource scarcity causes global wars – highly probable

**Klare 2006** – professor of peace and world security studies at Hampshire College

(Michael, Mar 6 2006, “The coming resource wars” http://www.energybulletin.net/node/13605)

It's official: the era of resource wars is upon us. In a major London address, British Defense Secretary John Reid warned that global climate change and **dwindling natural resources are combining to increase the likelihood of violent conflict** over land, water and energy. Climate change, he indicated, “will make scarce resources, clean water, viable agricultural land even scarcer”—and this will “make the emergence of violent conflict more rather than less likely.” Although not unprecedented, Reid’s prediction of an upsurge in resource conflict is significant both because of his senior rank and the vehemence of his remarks. “The blunt truth is that the lack of water and agricultural land is a significant contributory factor to the tragic conflict we see unfolding in Darfur,” he declared. “We should see this as a warning sign.” Resource conflicts of this type are most likely to arise in the developing world, Reid indicated, but the more advanced and affluent countries are not likely to be spared the damaging and destabilizing effects of global climate change. With sea levels rising, water and energy becoming increasingly scarce and prime agricultural lands turning into deserts, internecine warfare over access to vital resources will become a global phenomenon. Reid’s speech, delivered at the prestigious Chatham House in London (Britain’s equivalent of the Council on Foreign Relations), is but the most recent expression of a growing trend in strategic circles to view environmental and resource effects—rather than political orientation and ideology—as the most potent source of armed conflict in the decades to come. With the world population rising, global consumption rates soaring, energy supplies rapidly disappearing and climate change eradicating valuable farmland, the stage is being set for persistent and worldwide struggles over vital resources. Religious and political strife will not disappear in this scenario, but rather will be channeled into contests over valuable sources of water, food and energy.

#### Water scarcity causes extinction

**Coddrington 10** (7/1, http://www.tomorrowtoday.co.za/2010/07/01/a-looming-crisis-world-water-wars/

PhD-Business Adminstration & Guest lecturer at top business schools, including the London Business School, Duke Corporate Education and the Gordon Institute of Business Science.)

People go to war when their way of life is threatened. I have written before about the many issues we face in the coming years that threaten our way of life. These include global warming/climate change, pollution, pandemics, nuclear bombs, intelligent machines, genetics, and more. More and more I am becoming convinced that the next major regional/global conflict will be over water. We are much more likely to have water wars in the next decade than nuclear ones. And I were to guess, I’d say that it is most likely to happen in around North East Africa. This is a region with its own internal issues. But it also has the foreign involvement of America, China, the Middle Eastern Arab nations, and (increasingly) Israel. Quite a potent mix… Last week, Addis Ababa, Ethiopia hosted the 18th regular meeting of the Council of Ministers of Water Affairs of the Nile Basin countries. In the lead up to the conference, Ethiopia, Rwanda, Uganda, Tanzania and Kenya, the five countries that are all upstream of Egypt and Sudan concluded a water-sharing treaty – to the exclusion of Egypt and Sudan. This has obviously reignited the longstanding dispute over water distribution of the world’s longest river in the world’s driest continent. Egypt is currently the largest consumer of Nile water and is the main beneficiary of a 1929 treaty which allows it to take 55.5 billion cubic metres of water each year, or 87% of the White and Blue Nile’s flow. By contrast, Sudan is only allowed to draw 18.5 billion cubic metres. On attaining independence Sudan refused to acknowledge the validity of the Nile water treaty and negotiated a new bilateral treaty with Egypt in 1959. Kenya, Tanzania and Uganda also expressly refused to be bound by the treaty when they attained independence, but have not negotiated a new treaty since then. Under the 1929 treaty, Egypt has powers over upstream projects: The Nile Waters Agreement of 1929 states that no country in the Nile basin should undertake any works on the Nile, or its tributaries, without Egypt’s express permission. This gives Egypt a veto over anything, including the building of dams on numerous rivers in Kenya, Burundi, Rwanda, Tanzania, Ethiopia, and by implication Egypt has control over agriculture, industry and infrastructure and basic services such as drinking water and electricity in these countries. This is surely untenable. But if the other countries broke the treaty, would Egypt respond with force? Since the late 1990s, Nile Basin states have been trying unsuccessfully to develop a revised framework agreement for water sharing, dubbed the Nile Basin Initiative (NBI). In May 2009, talks held in Kinshasa broke down because Egypt and Sudan’s historical water quotas were not mentioned in the text of the proposed agreement. Water ministers met again in July 2009 in Alexandria, where Egypt and Sudan reiterated their rejection of any agreement that did not clearly establish their historical share of water. This is an untenable position. Upstream states accuse Egypt and Sudan of attempting to maintain an unfair, colonial-era monopoly on the river. Egyptian officials and analysts, however, defend their position, pointing out that Egypt is much more dependent on the river for its water needs than its upstream neighbours. Egypt claims that Nile water accounts for more than 95% of Egypt’s total water consumption, although they appear to be working hard to reduce both their water usage (they’re stopping growing rice, for example) and their dependence on the Nile.

### Solvency

#### Contention 4: Solvency

#### Loan guarantees solve – conservative arguments about cronyism and risk underestimation ignore 20 years of loan guarantee data to the contrary

**Griffith and Caperton, 12** - John Griffith is a Policy Analyst with the Economic Policy team at the Center for American Progress. Richard Caperton is the Director of Clean Energy Investment at the Center (Major Analysis: Federal Loans And Loan Guarantees Have A Huge Benefit But A Low And Predicatable Cost, 5/3, <http://thinkprogress.org/climate/2012/05/03/475978/major-analysis-federal-loans-and-loan-guarantees-have-a-huge-benefit-but-a-low-and-predicatable-cost/>)

These programs typically run at very low cost to taxpayers. On average, every $1 allocated to loan and guarantee programs generates more than $99 of economic activity from individuals, businesses, nonprofits, and state and local governments, according to our analysis.¶ But in the wake of certain widely publicized credit blunders, most notably this past summer’s bankruptcy announcement from solar company Solyndra LLC, some have called into question Washington’s ability to manage financial risk. Conservative critics contend that the government is incapable of accurately pricing risk, and that political pressure encourages government agencies to routinely underestimate the risk to taxpayers when extending credit.¶ Government underpricing of risk is a convenient theory for free-market ideologues but it runs contrary to the overwhelming evidence.¶ Our review of federal government credit programs back to 1992 shows that on average the government is quite accurate in its risk pricing. In fact, the majority of government credit programs cost less than originally estimated, not more. Specifically, we found that:¶ Based on initial estimates over the past 20 years, the government expected its credit programs to cost taxpayers 79 cents for every $100 loaned or guaranteed. Based on recently updated data, those cost predictions were reasonably accurate but slightly underestimated. The current budgetary impact of these programs is about 94 cents per $100 loaned or guaranteed.¶ There’s little evidence that credit programs are biased toward underpricing risk. In fact, a little more than half of all nonemergency federal credit programs will cost the government less than what they are expected to over the life of the program.¶ The remainder is accounted for by the losses suffered by the Federal Housing Administration on loans made in 2008 during the peak of the housing crisis. Excluding that book of loans, all nonemergency federal credit programs cost slightly less than expected.¶ Conservative critics often portray a world in which government bureaucrats haphazardly issue loans and loan guarantees without considering taxpayer exposure to risk. That’s simply not the case. This issue brief explains how the government prices credit risk in the federal budget, how well those cost estimates have reflected reality over the years, and why the government is in a particularly good position to assume certain types of risk.¶ Budgeting for credit risk¶ Federal government agencies adhere to strict budget and accounting standards to carefully assess the risks and potential losses associated with credit programs. Here’s how it works.¶ Before an agency can issue any loans or loan guarantees, Congress must first authorize and allocate funding for the program. In most cases Congress starts by determining how much money the program will be authorized to guarantee or loan and then appropriates a certain percentage of that amount to cover the program’s expected cost to the government. That cost estimate—assessed by both the agency administering the program and the president’s Office of Management and Budget—takes into account expected repayments, defaults, recoveries, and any interest or fees collected over the life of the loan, adjusted to current dollars.¶ The net cost to the federal government as a percentage of total dollars loaned or guaranteed is known as the subsidy rate. As an example, say Congress approves a $100 million loan guarantee program within the Department of Agriculture. The department models expected market conditions and loan activity and then estimates a subsidy rate, which the Office of Management and Budget independently estimates as a check on the agency’s methodology. Let’s say the estimated subsidy rate is 0.75 percent. That means the government expects to take a net loss of 75 cents for every $100 it guarantees over the life of those loans. To cover expected losses on the $100 million in loan guarantees, the government sets aside $750,000 in a special account at the Treasury Department. This is similar to a loan loss reserve at a private bank.¶ Each subsequent year, the Office of Management and Budget and the agencies recalculate the subsidy rate to reflect actual loan performance, current economic conditions, and anything else administrators may have learned about a program. These revised numbers are reported in the president’s budget each year, which gives us a pretty good idea of each program’s “actual” costs and the government’s ability to assess financial risk.¶ If conservative claims were accurate in saying that the federal government cannot accurately price for risk, then one would expect the initial cost estimates to be significantly lower than the more recent re-estimates. Using the Department of Agriculture example above, if the critics were right, the re-estimated subsidy rate would presumably be much higher than 0.75 percent, and actual outlays would be higher than estimated. Let’s see how the government’s risk estimates actually stack up.¶ Government risk estimates are quite accurate¶ To test this theory, we analyzed credit data published in the president’s 2013 budget. We compared initial and updated cost estimates, also known as subsidy re-estimates, for each book of nonemergency loans and loan guarantees for each federal credit program since 1992, the first year for which comprehensive data are available.¶ We limit our analysis to nonemergency credit programs, omitting programs created in response to the recent financial crisis. This includes programs created through the Troubled Asset Relief Program—the so-called Wall Street rescue package passed by Congress at the height of the housing and financial crises—and the U.S. Department of the Treasury’s purchase of securities issued by the two troubled housing finance giants Fannie Mae and Freddie Mac. Both of these programs are temporary, atypically large, and are accounted for in the federal budget using different standards than all other credit programs.¶ If we had included these “emergency” programs, it would drastically skew the overall results—but skew them in favor of our basic argument. Based on our analysis of data published in the 2013 budget, these programs will cost the government about $130 billion less than initially expected. So their inclusion would make it seem as though the government significantly overestimated the cost of all credit programs over the past 20 years, which is not the case.¶ We also exclude any federal credit program that is not listed in the federal credit supplement of president’s budget, and any program that did not publish a subsidy re-estimate in the 2013 budget. We do this both because complete data are unavailable for these programs and because their costs are not recorded in the federal budget. Notably, this includes insurance programs through the Federal Deposit Insurance Corporation, mortgage guarantees offered by the two housing finance giants Fannie Mae and Freddie Mac (both now under government conservatorship), and guarantees on mortgage-backed securities offered by the government corporation Ginnie Mae.¶ Here’s what we found out about nonemergency federal credit programs. Federal agencies have issued $5.7 trillion worth of these loans or loan guarantees since 1992. Based on our analysis of initial estimates, the government expected these programs to cost taxpayers about 79 cents for every $100 loaned or guaranteed, or a 0.79 percent subsidy rate overall.¶ Of course, no one expects those estimates to be perfect. Many of these loans such as home mortgages or funding for large infrastructure projects take decades to pay back. Government financial analysts are charged with the difficult task of modeling payments, defaults, recoveries, and market conditions for the entire life of the loan, so some error has to be expected.¶ But as it turns out, the initial estimates weren’t very far off. The current budgetary impact of these credit programs is about 94 cents per $100 loaned or guaranteed, or a 0.94 percent subsidy rate, according to our analysis of updated subsidy estimates. To put that in a budgetary context, while issuing nearly $6 trillion in loans and guarantees over the past 20 years, the government initially predicted about $45 billion in total costs to taxpayers, but the actual costs were slightly higher—about $53 billion.¶ That difference—$8 billion over two decades or $400 million per year—might seem high at first. But it amounts to just 0.15 percent of the total dollars loaned or guaranteed by the government and 0.02 percent of all government spending over that period.(see Figure 1)¶ Of course, the federal government’s performance on individual programs varied substantially. Some programs overestimate risks, while others underestimate. But as mentioned above, some conservatives argue that political pressures cause the government to systemically underprice costs to taxpayers when issuing loans or guarantees.¶ The data show this to be untrue. Of the 104 nonemergency credit programs administered since 1992, our analysis shows that most have actually overestimated total subsidy costs. Fifty-six programs overpriced risk over their lifetimes, while 48 programs underpriced risk. (see Figure 2)¶ Our analysis only takes into account lifetime costs for each program, not the federal government’s ability to estimate costs on an individual year’s portfolio of loans. Indeed, critics often point to individual data points such as the Solyndra bankruptcy as evidence of the government’s inability to price financial risk. But what matters most is actually the net budgetary impact over time of these inaccuracies, which is what is measured in Figure 1.¶ Overall these overestimates and underestimates—whether across programs or in individual books of business—tend to roughly balance out in the long run, give or take a reasonable margin of error. As we show in the following section, however, all of these underestimated losses can actually be attributed to a single year of mortgage guarantees made at the height of the housing crisis.

#### Government support is vital-~--it overcomes financial barriers to nuclear that the market cannot

Yanosek 12 Kassia, entrepreneur-in-residence at Stanford University’s Steyer-Taylor Center for Energy Policy and Finance and a private equity investor in the energy sector as a principal at Quadrant Management and Founder of Tana Energy Capital LLC, " Financing Nuclear Power in the US", Spring, energyclub.stanford.edu/index.php/Journal/Financing\_Nuclear\_Power\_by\_Kassia\_Yanosek

Over the course of the last decade, it appeared that concerns about carbon emissions, aging coal fleets, and a desire for a diversified generation base were reviving the U.S. utility sector interest in building new nuclear plants. Government and companies worked closely on design certification for Generation III reactors, helping to streamline the licensing process. New loan guarantees from the federal government targeted for nuclear projects were created as part of the 2005 Energy Policy Act. Consequently, dozens of projects entered the planning stages. Following more than 30 years in which no new units were built, it looked as if the U.S. nuclear industry was making significant headway. However, it is yet to be seen how many new nuclear projects will actually make it beyond blueprints due to one of the largest barriers to new nuclear construction: financing risk. Large upfront capital costs, a complex regulatory process, uncertain construction timelines, and technology challenges result in a risk/return profile for nuclear projects that is unattractive for the capital markets without supplementary government or ratepayer support. To many investors, nuclear seems too capital-intensive. Nuclear energy has attractive qualities in comparison to other sources of electricity. A primary motivation to pursue the development of nuclear energy in the U.S. has been its low operating fuel costs compared with coal, oil, and gas-fired plants. Over the lifetime of a generating station, fuel makes up 78% of the total costs of a coal-fired plant. For a combined cycle gas-fired plant, the figure is 89%. According to the Nuclear Energy Institute, the costs for nuclear are approximately 14%, and include processing, enrichment, and fuel management/disposal costs. Today’s low natural gas prices have enhanced the prospects of gas-fired power, but utilities still remain cautious about over-investing in new natural gas generation given the historical volatility of prices. Furthermore, nuclear reactors provide baseload power at scale, which means that these plants produce continuous, reliable power to consistently meet demand. In contrast, renewable energies such as wind or solar are only available when the wind blows or the sun shines, and without storage, these are not suitable for large-scale use. Finally, nuclear energy produces no carbon emissions, which is an attractive attribute for utilities that foresee a carbon tax being imposed in the near future. Given nuclear’s benefits, one may wonder why no new nuclear units have been ordered since the 1970s. This hiatus is in great part due to nuclear’s high cost comparative to other alternatives, and its unique set of risks. As a result, financing nuclear has necessitated government involvement, as the cost of nuclear typically exceeds that of the cost of conventional generation technologies such as coal and natural gas fired generation on a levelized cost of energy (LCOE) basis. LCOE represents the present value of the total cost of building and operating a generating plant over its financial life, converted to equal annual payments and amortized over expected annual generation, and is used to compare across different power generation technologies. For both regulated utilities and independent power producers, nuclear is unattractive if the levelized cost exceeds that of other technologies, since state utility commissions direct regulated utilities to build new capacity using the technology with the lowest LCOE. Furthermore, capital costs are inherently high, ranging in the billions or tens of billions of dollars, and are compounded by financing charges during long construction times. Without government support, financing nuclear is currently notpossible in the capital markets. Recently, Constellation Energy and NRG separately pulled the plug on new multi-billion dollar plants, citing financing problems. Projects, however, will get done on a one-off basis. Southern Company’s Vogtle Plant in Eastern Georgia is likely to be the sponsor of the first new generation to be constructed, taking advantage of local regulatory and federal support. Two new reactors of next-generation technology are in the permitting stage, which will bring online 2,200 megawatts (MW) of new capacity, and will cost $14 billion. The project will take advantage of tax credits and loan guarantees provided in the 2005 Energy Policy Act.

#### And, loan guarantees solve nuclear expansion – shows investors the government has skin in the game, and incentivizes quick agency approval

Adams 10—Publisher of Atomic insights Was in the Navy for 33 years Spent time at the Naval Academy Has experience designing and running small nuclear plants (Rod, Concrete Action to Follow Strongly Supportive Words On Building New Nuclear Power Plants, atomicinsights.com/2010/01/concrete-action-to-follow-strongly-supportive-words-on-building-new-nuclear-power-plants.html)

Loan guarantees are important to the nuclear industry because the currently available models are large, capital intensive projects that need a stable regulatory and financial environment. The projects can be financed because they will produce a regular stream of income that can service the debt and still provide a profit, but that is only true if the banks are assured that the government will not step in at an inopportune time to halt progress and slow down the revenue generation part of the project. Bankers do not forget history or losses very easily; they want to make sure that government decisions like those that halted Shoreham, Barnwell’s recycling facility or the Clinch River Breeder Reactor program are not going to be repeated this time around. For the multi-billion dollar projects being proposed, bankers demand the reassurance that comes when the government is officially supportive and has some “skin in the game” that makes frivolous bureaucratic decisions to erect barriers very expensive for the agency that makes that decision. I have reviewed the conditions established for the guarantee programs pretty carefully – at one time, my company ([Adams Atomic Engines, Inc.](http://www.atomicengines.com)) was considering filing an application. The loan conditions are strict and do a good job of protecting government interests. They were not appropriate for a tiny company, but I can see where a large company would have less trouble complying with the rules and conditions. The conditions do allow low or no cost intervention in the case of negligence or safety issues, but they put the government on the hook for delays that come from bad bureaucratic decision making.

#### Plan is modeled internationally

**Blees et al** 11 (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) [http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/](http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http%3A//bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/)

There are many compelling reasons to pursue the rapid demonstration of a full-scale IFR, as a lead-in to a subsequent global deployment of this technology within a relatively short time frame. Certainly the urgency of climate change can be a potent tool in winning over environmentalists to this idea. Yet political expediency—due to widespread skepticism of anthropogenic causes for climate change—suggests that the arguments for rolling out IFRs can be effectively tailored to their audience. Energy security—especially with favorable economics—is a primary interest of every nation.¶ The impressive safety features of new nuclear power plant designs should encourage a rapid uptick in construction without concern for the spent fuel they will produce, for all of it will quickly be used up once IFRs begin to be deployed. It is certainly manageable until that time. Burying spent fuel in non-retrievable geologic depositories should be avoided, since it represents a valuable clean energy resource that can last for centuries even if used on a grand scale.¶ Many countries are now beginning to pursue fast reactor technology without the cooperation of the United States, laboriously (and expensively) re-learning the lessons of what does and doesn’t work. If this continues, we will see a variety of different fast reactor designs, some of which will be less safe than others. Why are we forcing other nations to reinvent the wheel? Since the USA invested years of effort and billions of dollars to develop what is arguably the world’s safest and most efficient fast reactor system in the IFR, and since several nations have asked us to share this technology with them (Russia, China, South Korea, Japan, India), there is a golden opportunity here to develop a common goal—a standardized design, and a framework for international control of fast reactor technology and the fissile material that fuels them. This opportunity should be a top priority in the coming decade, if we are serious about replacing fossil fuels worldwide with sufficient pace to effectively mitigate climate change and other environmental and geopolitical crises of the 21st century.

#### IFR’s S-PRISM design is really safe

**Blees et al 11** (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/

Metal Fuel: The Ultimate Safety Valve¶ One of the most important of the many superlatives of the IFR is its use of a metal fuel comprised of uranium, plutonium and zirconium, and the ingenious manner in which the Argonne team solved the problems of fuel expansion and fuel fabrication, as well as the potentially dangerous overheating scenario. Unlike the fuel fabrication of oxide-fueled reactors that requires the dimensions of the fuel pellets to be uniform to very exacting tolerances, the metal fuel for the IFR can be simply injected into molds and then cooled and inserted into metal tubes (cladding) with a great deal of dimensional tolerance, with a sodium bond filling any voids. If an accident situation occurs that would cause the core to overheat, such as a loss of coolant flow accident, the metal fuel itself will expand, causing neutron leakage to terminate the chain reaction, relying on nothing but the laws of physics.¶ The passive safety characteristics of the IFR were tested in EBR-II on April 3, 1986, against two of the most severe accident events postulated for nuclear power plants. The first test (the Loss of Flow Test) simulated a complete station blackout, so that power was lost to all cooling systems. The second test (the Loss of Heat Sink Test) simulated the loss of ability to remove heat from the plant by shutting off power to the secondary cooling system. In both of these tests, the normal safety systems were not allowed to function and the operators did not interfere. The tests were run with the reactor initially at full power.¶ In both tests, the passive safety features simply shut down the reactor with no damage. The fuel and coolant remained within safe temperature limits as the reactor quickly shut itself down in both cases. Relying only on passive characteristics, EBR-II smoothly returned to a safe condition without activation of any control rods and without action by the reactor operators. The same features responsible for this remarkable performance in EBR-II will be incorporated into the design of future IFR plants, regardless of how large they may be [xi].¶ While the IFR was under development, a consortium of prominent American companies led by General Electric collaborated with the IFR team to design a commercial-scale reactor based upon the EBR-II research. This design, currently in the hands of GE, is called the PRISM (Power Reactor Innovative Small Module). A somewhat larger version (with a power rating of 380 MWe) is called the S-PRISM. As with all new nuclear reactor designs (and many other potentially hazardous industrial projects), probabilistic risk assessment studies were conducted for the S-PRISM. Among other parameters, the PRA study estimated the frequency with which one could expect a core meltdown. This occurrence was so statistically improbable as to defy imagination. Of course such a number must be divided by the number of reactors in service in order to convey the actual frequency of a hypothetical meltdown. Even so, if one posits that all the energy humanity requires were to be supplies solely by IFRs (an unlikely scenario but one that is entirely possible), the world could expect a core meltdown about once every 435,000 years [xii]. Even if the risk assessment understated the odds by a factor of a thousand, this would still be a reactor design that even the most paranoid could feel good about.

#### IFRs are ready for commercial application – solves tech leadership and coal plants

**Kirsh 11** (Steven T. Kirsh, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, “Why Obama should meet Till,” 9/28/11) http://bravenewclimate.com/2011/09/28/why-obama-should-meet-till/¶ I will tell you the story of an amazing clean power technology that can use nuclear waste for fuel and emit no long-lived nuclear waste; that can supply clean power at low cost for our planet, 24×7, for millions of years without running out of fuel. I will tell you why this technology is our best bet to reduce the impact of global warming on our planet. And finally, I will tell you why nobody is doing anything about it and why this needs to be corrected.¶ If you act on this letter, you will save our country billions of dollars and allow us to become leaders in clean energy. If you delegate it downward, nothing will happen.¶ I have no vested interest in this; I am writing because I care about the future of our planet¶ First, since we met only briefly during the Obama campaign, let me provide a little background about myself. I am a high-tech entrepreneur and philanthropist based in Silicon Valley. I have received numerous awards for my philanthropy. For example, in 2003, I was honored to receive a National Caring Award presented by then Senator Clinton. The largest engineering auditorium at MIT is named in my honor. The first community college LEED platinum building in the nation is also named in my honor.¶ I am also active in Democratic politics. In the 2000 election, for example, I was the single largest political donor in the United States, donating over $10 million dollars to help Al Gore get elected. Unfortunately, we lost that one by one vote (on the Supreme Court).¶ I have no vested interest in nuclear power or anything else that is described below. I write only as someone who cares about our nation, the environment, and our planet. I am trying to do everything I can so my kids have a habitable world to live in. Nothing more.¶ Dr. James Hansen first made me aware of fast reactors in his letter to Obama in 2009¶ As an environmentalist, I have been a fan of Jim Hansen’s work for nearly two decades. Many consider Dr. Hansen to be the world’s leading expert on global warming. For example, Hansen was the first person to make Congress aware of global warming in his Senate testimony in 1988. Hansen is also Al Gore’s science advisor.¶ In 2009, Dr. Hansen wrote a letter to President Obama urging him to do just three things that are critical to stop global warming: 1) phase out coal plants, 2) impose a feebate on carbon emissions with a 100% rebate to consumers and 3) re-start fourth generation nuclear plants, which can use nuclear waste as fuel. Hansen’s letter to Obama is documented here: http://www.guardian.co.uk/environment/2009/jan/02/obama-climate-change-james-hansen¶ Upon reading Hansen’s recommendations, I was fascinated by the last recommendation. The fourth-generation power plants Hansen advocated sounded too good to be true. If what Hansen was saying was true, then why wasn’t our nation jumping on that technology? It made no sense to me.¶ Lack of knowledge, misinformation, and the complexity of nuclear technology have hampered efforts to get a fast reactor built in the US¶ I spent the next two years finding out the answer to that question. The short answer is three-fold: (1) most people know absolutely nothing about the amazing fourth generation nuclear power plant that we safely ran for 30 years in the US and (2) there is a lot of misleading information being spread by seemingly respectable people (some of whom are in the White House) who never worked on a fourth generation reactor that is totally false. It’s not that they are misleading people deliberately; it’s just that they were either listening to the wrong sources or they are jumping to erroneous conclusions. For example, the most popular misconception is that “reprocessing is a proliferation risk.” That statement fails to distinguish between available reprocessing techniques. It is absolutely true for the French method but it is absolutely not true for the technology described in this letter! The third reason is that the technology is complicated. Most people don’t know the difference between oxide fuel and metal fuel. Most people don’t know what a fast reactor is. Most people can’t tell you the difference between PUREX, UREX, and pyroprocessing. So people with an agenda can happily trot out arguments that support their beliefs and it all sounds perfectly credible. They simply leave out the critical details.¶ We don’t need more R&D. We already have a technology in hand to help us solve global warming and safely get rid of our nuclear waste at low cost. But we aren’t doing anything with it. That’s a serious mistake.¶ Today, our nation faces many serious challenges such as:¶ How can we avert global warming?¶ How can we dispose of our existing nuclear waste safely?¶ How can we generate base-load carbon-free power at very low cost?¶ How can we avoid creating any additional long-lived nuclear waste?¶ How can we grow our economy and create jobs?¶ How can we become the world leader in clean energy?¶ How can we do all of the above while at the same time spending billions less than we are now?¶ The good news is that we already have a proven technology that can address all of these problems. It is a technology that has enjoyed over 30 years of bi-partisan Congressional and Presidential support. It is an advanced nuclear technology that was invented in 1951 by the legendary Walter Zinn and then refined and perfected over a 30 year period, from 1964 to 1994 by Dr. Charles Till who led a team of 1,200 people at the Argonne National Laboratory. Till’s reactor was known as the Integral Fast Reactor (IFR) because it both produced power and recycled its own waste back into the reactor. This is the technology that Hansen referenced in his letter to the President.¶ The IFR is a fourth-generation nuclear design that has several unique and valuable characteristics:¶ It can use our existing nuclear waste (from power plants and weapons) as fuel; we have over 1,000 years of power available by just using today’s nuclear waste. Instead of trying to bury that “waste” in Yucca Mountain, we could be using it for fuel in fast reactors.¶ It generates no long-lived nuclear waste.¶ It is safer than today’s light water reactor (LWR) nuclear power plants. Unlike the Fukushima LWR reactors (a second generation nuclear technology invented 50 years ago), the IFR does NOT require electricity to shut down safely. The IFR shuts down passively if a mishap occurs; no operator intervention or active safety systems are required. They ran the Three Mile Island and Chernobyl scenarios on a live reactor and the reactor shut itself down safely, no operator intervention required, just as predicted. In addition, unlike with LWRs, the IFR runs at low pressure which adds to the safety profile.¶ It reduces the risk of nuclear proliferation because: (1) it eliminates the need for enrichment facilities (which can be used for making nuclear bomb material), (2) the nuclear material that is used in the IFR is not suitable for making bombs and (2) because the nuclear material in the reactor and in the reprocessing hot cell is too “hot” to be stolen or used in a weapon.¶ Experts at General Electric (GE) believe that the IFR has the potential to produce power for less than the price of coal. Dr. Loewen can confirm that if you have any doubts.¶ GE already has an IFR design on the table that they would like to build as soon as possible. Dr. Loewen can confirm that as well.¶ The US Nuclear Regulatory Commission, in January 1994, issued a pre-application safety evaluation report in which they found no objections or impediments to licensing the IFR. You can see the NRC report in the 8 minute video.¶ The design is proven. It produced electric power without mishap for 30 years before the project was abruptly cancelled.¶ Dr Charles Till¶ The IFR’s ability to solve the nuclear waste problem should not be underestimated. As respected nuclear experts have pointed out, a practical solution to the nuclear waste problem is required if we are to revive nuclear power in the United States. The Blue Ribbon Commission (BRC) on America’s Nuclear Future basically concluded this: “continue doing the same thing we are doing today and keep doing R&D.” That was predictable because it was a consensus report; everyone had to agree. So nothing happened. And because there was no consensus from the BRC , there is less money for nuclear because there is no solution to the waste problem. It’s a downward death spiral.¶ Please pardon me for a second and allow me to rant about consensus reports. In my 30 year career as an entrepreneur, I’ve raised tens of millions of millions of dollars in investment capital from venture capitalists all over the world. I always ask them how they make investment decisions. They always tell me, “If we had to get all partners to agree on an investment, we’d never make any investments. If you can get two partners to champion your company, that is sufficient to drive an investment decision.” Therefore, if you want to get nothing done, ask for a consensus report. If you want to actually solve problems, you should listen to what the people most knowledgeable about the problem are saying.¶ Dr Yoon I. Chang¶ Had President Obama asked the Commissioners on the Nuclear Regulatory Commission (NRC) who have the most knowledge of fast reactors the same question that he tasked the BRC with, he would have gotten a completely different answer. They would have told President Obama that fast reactors and pyroprocessing are the way to go and we better get started immediately with something that we already know works because there is still a ten year time if we were to start the reactor building process today. Their advice leads to a viable solution that we know will work and it will make the US a leader in clean nuclear power. Following the BRC’s consensus advice will lead to decades of inaction. Totally predictable.¶ If we put a national focus on developing and cost reducing the IFR, we’d have a killer product and lead the world in being a clean energy leader¶ It would be great if we had a long-term strategy and vision for how we become energy independent and solve the global warming problem and help our economy at the same time. The IFR can play a key role in that vision. If we put a national focus on developing and commercializing the IFR technology we invented, we can create jobs, help our trade balance, mitigate global warming, become energy independent, show the world a safe way to get rid of nuclear waste, and become the leaders in clean power technology.¶ Nuclear power is the elephant in the room. Even though we haven’t built a new nuclear plant in 30 years, nuclear still supplies 70% of the clean energy in America today. That feat was largely accomplished in a single ten year period. Renewables have had 3 decades to “catch up” and they aren’t anywhere close. Nuclear’s continued dominance shows that nuclear power is indeed the elephant in the room when it comes to being able to install clean energy quickly and affordably.¶ The bad news is that President Clinton decided that this technology, which would have produced unlimited amounts of base-load carbon-free power for a price as low as anything else available today, was not needed and cancelled the project in 1994.¶ Cancelling the IFR was a big mistake. It’s still the world’s best fast nuclear technology according to an independent study by the Gen IV International Forum.¶ Many top scientists all over the world believe that President Clinton’s decision was a huge mistake. The Senate had voted to continue to fund it. The project had been supported by six US Presidents; Republicans and Democrats. In fact, the project’s biggest proponent was Republican President Richard Nixon who said in 1971, “Our best hope today for meeting the Nation’s growing demand for economical clean energy lies with the fast breeder reactor.”¶ Republican Senator Kempthorne said of the IFR cancellation:¶ Unfortunately, this program was canceled just 2 short years before the proof of concept. I assure my colleagues someday our Nation will regret and reverse this shortsighted decision. But complete or not, the concept and the work done to prove it remain genius and a great contribution to the world.¶ While I am not a big fan of Senator Kempthorne, I couldn’t agree more with what he said in this particular case.¶ The IFR remains the single best advanced nuclear power design ever invented. That fact was made clear when in 2002, over 240 leading nuclear scientists from all over the world (in a Gen IV International Forum sponsored study) independently evaluated all fourth-generation nuclear designs and ranked the IFR the #1 best overall advanced nuclear design.¶ The IFR was cancelled in 1994 without so much as a phone call to anyone who worked on the project. They didn’t call then. They haven’t called since. They simply pulled the plug and told people not to talk about the technology.¶ The US government invested over $5 billion dollars in the IFR. Fast reactor R&D is largest single technology investment DOE has ever made. According to a top DOE nuclear official (Ray Hunter, the former NE2 at DOE), the “IFR became the preferred path because of waste management, safety, and economics.” The reactor produced power for 30 years without incident. Despite that track record, before it was cancelled, nobody from the White House ever met with anyone who worked on the project to discuss whether it should be terminated or not. It was simply unilaterally terminated by the White House for political reasons. Technical experts were never consulted. To this day, no one from the White House has met with Dr. Till to understand the benefits of the project. The technical merits simply did not matter.¶ I urge you to recommend to President Obama that he meet personally with Dr. Charles Till so that the President can hear first hand why it is so critical for the health of our nation and our planet that this project, known as the Integral Fast Reactor (IFR), be restarted. Dr. Till headed the project at Argonne National Laboratory until his retirement in 1997. He is, without a doubt, the world’s leading expert on IFR technology.¶ Want to solve global warming? Easy. Just create a 24×7 clean power source that costs the same as coal. Prominent scientists believe that the IFR can achieve this.¶ Dr. Hansen has pointed out many times that it is imperative to eliminate all coal plants worldwide since otherwise, we will never win the battle against global warming. But we know from experience that treaties and agreements do not work. Here’s a quote from an article (“The Most Important Investment that We Aren’t Making to Mitigate the Climate Crisis”) that I wrote in December 2009 published in the Huffington Post:¶ If you want to get emissions reductions, you must make the alternatives for electric power generation cheaper than coal. It’s that simple. If you don’t do that, you lose.¶ The billions we invest in R&D now in building a clean and cheaper alternative to coal power will pay off in spades later. We have a really great option now — the IFR is on the verge of commercial readiness — and potential competitors such as the Liquid Fluoride Thorium Reactor (LFTR) are in the wings. But the US government isn’t investing in developing any of these breakthrough new base-load power generation technologies. Not a single one.¶ I found it really amazing that global leaders were promising billions, even hundreds of billions in Copenhagen for “fighting climate change” when they weren’t investing one cent in the nuclear technologies that can stop coal and replace it with something cheaper.¶ [ Note: 6 days ago, on September 22, 2011, DOE agreed to give $7.5M to MIT to do R&D on a molten-salt reactor. That’s good, but we should be building the technology we already have proven in 30 years of operational experience before we invest in unproven new technologies. ]¶ Dr. Loewen has personally looked at the costs for the building the IFR in detail and believes the IFR can generate power at a cost comparable to a coal plant. So it’s arguably our best shot at displacing coal plants. This is precisely why Dr. Hansen believes that the IFR should be a top priority if we want to save our planet.¶ It isn’t just nuclear experts that support the IFR¶ US Congressman John Garamendi (D-CA) is also a major IFR supporter. When he was Lt. Governor of California, Congressman Garamendi convened a panel of over a dozen our nation’s top scientists to discuss the IFR technology. As a result of that meeting, Garamendi became convinced that the IFR is critically important and he is currently trying very hard to get a bill passed in the House to restart it. Unfortunately, virtually everyone in Congress seems to have forgotten about this project even though in the 1970’s it was the President’s top energy priority. Nothing has changed since then. No other clean energy technology has been invented that is superior to the IFR for generating low-cost carbon-free base-load electric power.¶ Bill Gates also found exactly the same thing when he looked at how to solve the global warming problem. As he explained in a recent TED talk, renewables will never solve the climate crisis. The only viable technology is fourth-generation nuclear power and the best advanced nuclear technology is the IFR. That is why this is Gate’s only clean energy investment. Gates’ TerraPower Travelling Wave Reactor (TWR) is a variant of the IFR design. When Gates approached DOE to try to build his reactor in the US, he was told to build it outside of the US.¶ Nobel prize winner Hans Bethe (now deceased) was an enthusiastic supporter. Freeman Dyson called Bethe the “supreme problem solver of the 20th century. Chuck Till told me the following story of Bethe’s support for the IFR:¶ A tale from the past: A year or two before the events I’ll describe, Hans Bethe had been contacted by the Argonne Lab Director for his recommendation on who to seek to replace the existing head of Argonne’s reactor program.¶ Bethe told him the best choice was already there in the Lab, so it was in this way that I was put in charge. I had had quite a few sessions with him in the years leading up to it, as we were able to do a lot of calculations on the effects of reactor types on resources that he didn’t have the capability at his disposal to do himself.¶ So when I wanted to initiate the IFR thrust, the first outside person I went to was Bethe at Cornell. After a full day of briefing from all the specialists I had taken with me, he suggested a brief private meeting with me. He was direct. He said “All the pieces fit. I am prepared to write a letter stating this. Who do you want me to address it to? I think the President’s Science Advisor, don’t you?” I said the obvious – that his opinion would be given great weight, and would give instant respectability.¶ He went on, “I know him quite well. Who else?” I said I was sure that Senator McClure (who was chairman of Senate Energy and Resources at the time) would be relieved to hear from him. That the Senator would be inclined to support us, as we were fairly prominent in the economy of the state of Idaho, and for that reason I had easy access to him. But to know that Hans Bethe, a man renowned for his common sense in nuclear and all energy matters, supported such an effort would give him the Senator solid and quotable reason for his own support, not dismissible as parochial politics, that the Senator would want if he was to lead the congressional efforts. “Yes,” he said in that way he had, “I agree.”¶ I’ve always thought that the President’s Science Advisor’s intervention with DOE, to give us a start, was not the result of our meeting him, but rather it was because of the gravitas Hans Bethe provided with a one page letter.¶ How do we lead the world in clean energy if we put our most powerful clean energy technology on the shelf?!?¶ President Obama has stated that he wants the US to be a leader in clean energy. I do not see how we achieve that if we allow our most advanced clean energy technology to sit on the shelf collecting dust and we tell one of America’s most respected businessmen that he should build his clean energy technology in another country. We have an opportunity here to export energy technology to China instead of importing it. But due to Clinton’s decision, we are allowing the Russians to sell similar fast reactor technology to the Chinese. It should have been us.¶ Re-starting the IFR will allow us to cancel a $10 billion stupid expenditure. The IFR only costs $3B to build. We’d get more, pay less. On pure economics alone, it’s a no brainer.¶ Finally, even if you find none of the arguments above to be compelling, there is one more reason to restart the IFR project: it will save billions of dollars. Today, we are contracting with the French to build a MOX reprocessing plant in Savannah River. The cost of that project is $10 billion dollars. We are doing it to meet our treaty obligations with the Russians. Former top DOE nuclear managers agree this is a huge waste of money because we can build an IFR which can reprocess 10 times at much weapons waste per year for a fraction of that cost.¶ The Russians are laughing at our stupidity. They are going to be disposing of their weapons waste in fast reactors, just like we should be. The Russians are also exporting their fast reactors to the Chinese. Had the US not cancelled our fast reactor program, we would be the world leader in this technology because our technology remains better than any other fourth generation technology in the world.¶ If you delegate this to someone else, nothing will happen. Here’s why.¶ Delegating this letter downward from the White House to someone in DOE to evaluate will result in inaction and no follow up. I know this from past attempts that have been made. It just gets lost and there is no follow up. Every time. The guys at DOE want to do it, but they know that they will get completely stopped by OMB and OSTP. Both Carol Browner and Steven Chu asked former DOE nuclear management what to do about nuclear waste. They were told that using fast reactors and reprocessing was the way to go. But nothing happened. So Chu has given up trying. According to knowledgeable sources, the White House has told DOE in no uncertain terms, “do not build anything nuclear in the US.” It’s not clear who is making these decisions, but many people believe it is being driven by Steven Fetter in OSTP.¶ Dr. Till knows all of this. He knows that unless he personally meets with the President to tell the story of this amazing technology, nothing will happen.¶ I’ve discussed the IFR with Steve Fetter and he has his facts wrong. Fetter is basically a Frank von Hippel disciple: they have written at least 14 papers together! It was von Hippel who was largely responsible for killing the IFR under Clinton.¶ So von Hippel’s misguided thought process is driving White House policy today. That’s a big mistake. Professor von Hippel twists the facts to support his point of view and fails to bring up compelling counter arguments that he knows are true but would not support his position. He’s not being intellectually honest. I’ve experienced this myself, firsthand. For example, von Hippel often writes that fast reactors are unreliable. When I pointed out to him that there are several examples of reliable fast reactors, including the EBR-II which ran for decades without incident, he said, that these were the “exceptions that prove the rule.” I was floored by that. That’s crazy. It only proves that it is complicated to build a fast reactor, but that it can easily be done very reliably if you know what you are doing. There is nothing inherent to the technology that makes it “unreliable.” You just have to figure out the secrets. When von Hippel heard that Congressman Garamendi was supporting the IFR, he demanded a meeting with Garamendi to “set him straight.” But what happened was just the opposite: Garamendi pointed out to von Hippel that von Hippel’s “facts” were wrong. Von Hippel left that meeting with Garamendi with his tail between his legs muttering something about that being the first time he’s ever spoken with anyone in Congress who knew anything about fast nuclear reactors. In short, if you watch a debate between von Hippel and Garamendi (who is not a scientist), Garamendi easily wins on the facts. If you put von Hippel up against someone who knows the technology like Till, Till would crush von Hippel on both the facts and the arguments. But the Clinton White House never invited Till to debate the arguments with von Hippel. They simply trusted what von Hippel told them. Big mistake.¶ There are lots of problems with von Hippel’s arguments. For example, von Hippel ignores reality believing that if the USA doesn’t do something then it will not happen. That’s incredibly naieve and he’s been proven wrong. The USA invented a safe way to reprocess nuclear waste that isn’t a proliferation risk called pyroprocessing. The nuclear material is not suitable for making a bomb at any time in the process. But we never commercialized it because von Hippel convinced Clinton to cancel it. The French commercialized their reprocessing process (PUREX) which separates out pure plutonium and makes it trivial to make bomb material. So because countries need to reprocess, they pick the unsafe technology because they have no alternative. Similarly, because von Hippel had our fast reactor program cancelled, the Russians are the leaders in fast reactor technology. They’ve been using fast reactor technology for over 30 years to generate power commercially. But we know the Russians have a terrible nuclear safety record (e.g., Chernobyl). The fact is that the Chinese are buying fast reactors from the Russians because there is no US alternative. The problem with von Hippel’s arguments are that the genie is out of the bottle. We can either lead the world in showing how we can do this safely, or the world will choose the less safe alternatives. Today, von Hippel’s decisions have made the world less safe. I could go on and on about how bad von Hippel’s advice is, but this letter is already way too long.¶ MIT was wrong in their report about “The Future of the Nuclear Fuel Cycle”¶ The only other seemingly credible argument against building fast reactors now comes from MIT. The report’s recommendation that we have plenty of time to do R&D appears largely to be driven by one person, co-chair Ernie Moniz.¶ Four world-famous experts on nuclear power and/or climate change and one Congressman challenged Moniz to a debate on the MIT campus on his report. Moniz declined.¶ The report has several major problems. Here are a few of them.¶ The MIT report is inconsistent. On the one hand it says, “To enable an expansion of nuclear power, it must overcome critical challenges in cost, waste disposal, and proliferation concerns while maintaining its currently excellent safety and reliability record.” We agree with that! But then it inexplicably says, “… there are many more viable fuel cycle options and that the optimum choice among them faces great uncertainty…. Greater clarity should emerge over the next few decades… A key message from our work is that we can and should preserve our options for fuel cycle choices by …[continuing doing what we are doing today] … and researching technology alternatives appropriate to a range of nuclear energy futures.” So even though we have a solution now that can be deployed so we can enable an expansion of nuclear power as soon as possible, MIT advises that we should spend a few more decades because we might find something better than the IFR. This is just about the dumbest thing I’ve ever heard coming from MIT. If you ask any scientist who knows anything about global warming, they will tell you we are decades late in deploying carbon-free power. Had we aggressively ramped fast nuclear closed-cycle reactors decades ago and promoted them worldwide, we wouldn’t be anywhere close to the disastrous situation we are in today. So we are decades too late in ramping up nuclear power, and Moniz wants us to spend decades doing more R&D to get a solution that might be lower cost than the IFR. That’s insane.¶ The report looks at the market price of uranium, but the market price completely ignores the environmental impacts of uranium mining. Shouldn’t that be taken into account? It’s like the cost of gas is cheap because the market price doesn’t include the hidden costs: the impact on the environment and on our health.¶ Do you really think that people are going to embrace expansion of uranium mining in the US? The MIT report is silent on that. So then we are back to being dependent on other countries for uranium. Wasn’t the whole point to be energy independent? The IFR provides that now. We wouldn’t have to do any uranium mining ever again. After a thousand years, when we’ve used all our existing nuclear waste as fuel, we can extract the additional fuel we need from seawater, making our seas less radioactive. We can do that for millions of years.¶ The MIT report ignores what other countries are doing. Obama wants the US to be a leader in clean energy technology. You do that by building the most advanced nuclear designs and refining them. That’s the way you learn and improve. MIT would have us stuck on old LWR technology for a few decades. Does anyone seriously think that is the way to be the world leader? There is virtually no room for improvement in LWR technology. IFR technology is nearly 100 times more efficient, and it emits no long term nuclear waste. If you are a buyer of nuclear power in China, which nuclear reactor are you going to pick? The one that is 100 times more efficient and generates no waste? Or the one that is 100 times less efficient and generates waste that you better store for a million years? Wow. Now that’s a real tough question, isn’t it. Gotta ponder that one. I’m sure Apple Computer isn’t taking advice from Moniz. If they were, they’d still be building the Apple I. Ernie should get a clue. The reason Apple is a market leader is because they bring the latest technology to market before anyone else, not because they keep producing old stuff and spend decades doing R&D to see if they can come up with something better. Other countries are not hampered by MIT’s report. France and Japan recently entered into an agreement with the US DOE whereby we’re giving them the IFR technology for them to exploit. Even though we are stupid, they aren’t stupid. The Chinese are ordering inferior oxide fueled fast reactors from Russia. If the US were building metal-fueled fast reactors with pyroprocessing, it’s a good bet the Chinese would be buying from us instead of the Russians. But if we take Moniz’s advice to not build the world’s best advanced nuclear technology we already have, then there is no chance of that happening. By the time we get to market with a fast reactor, it will be all over. We’ll arrive to the market decades late. Another great American invention that we blew it on.¶ There will always be new technologies that people will propose. But the IFR is a bird in the hand and we really need a solution now we can depend on. If something comes along later that is better, that’s great. But if it doesn’t, we will have a viable technology. We can’t afford to get this wrong. We have already run out of time. Any new nuclear designs are decades away from deployment.¶ On September 22, 2011, DOE agreed to give MIT $7.5 millions of dollars on starting R&D on a fourth generation molten salt reactor design that have never been proven. While it might work, the very smart scientists at Oak Ridge National Laboratory spent well over a decade on this and were never able to make it work. So DOE is spending millions on an unproven design while spending nothing on the “sure thing” fourth generation reactor that we already know how to build and that ran flawlessly for 30 years. We are all scratching our heads on that one. It makes no sense. But the reason for this is clear: the mandate from the White House that nothing is to built means that DOE can only initiate research, and then cancel the project right before anything would be built. This is an excellent plan for demoralizing scientists and allowing other countries to lead the world in clean energy. Is that really what we want?? If so, then there are much less expensive ways to accomplish that.¶ At a minimum we should be investing in commercializing our “bird in the hand.” That way, if the new molten salt reactor experiments don’t work out, we’ll still have a viable solution to the nuclear waste problem. If we keep cancelling successful projects right before they are done, hoping for the next big thing, we will forever be in R&D mode and get nothing done. That’s where we are today with fourth generation nuclear.¶ I know this is an unusual request, but I also know that if the President is allowed to evaluate the facts first hand, I am absolutely convinced that he will come to the same conclusion as we all have.¶ I urge you to view an 8 minute video narrated by former CBS Morning News anchor Bill Kurtis that explains all of this in a way that anyone can understand. This video can be found at:¶ The video will amaze you.¶ If you would like an independent assessment of what I wrote above from a neutral , trustworthy, and knowledgeable expert, Bill Magwood would be an excellent choice. Magwood was head of nuclear at DOE under Clinton and Bush, and was the longest serving head of nuclear at DOE in US history. He served under both Clinton and Bush administrations. Magwood is familiar with the IFR, but the IFR was cancelled before he was appointed to head civilian nuclear at DOE. So Magwood has no vested interest in the IFR at all. More recently, Magwood was appointed by President Obama to serve on the NRC and is currently serving in that role. Of the current five NRC Commissioners, Magwood is by far, the person most knowledgeable (PMK) about fast reactors.¶ Thank you for your help in bringing this important matter to the President’s attention.¶ Summary¶ Nuclear power is needed. Renewables alone won’t do it.¶ In order to revive nuclear in the US, you must have a viable solution to the nuclear waste problem.¶ The French reprocess their nuclear waste, but their process is expensive, environmentally unfriendly, and has proliferation problems.¶ The USA developed an inexpensive, environmentally friendly, and proliferation resistant method to reprocess our waste (the IFR), but we cancelled it. That decision was a mistake.¶ We should restart the IFR in the US. It will cost $3B to build, but we can cancel the Areva MOX plant and save $10B to pay for it. So we’ll save money, save the planet from an environmental catastrophe, create jobs, get rid of our nuclear waste, and become the world leader in clean energy technology.¶ President Obama should meet personally with Dr. Charles Till, the world’s leading expert on fast reactor technology. Dr. Till will not waste his time meeting with anyone other than the President because he knows that without personal support of the President, nothing will happen. He’s right.¶ Supporters of this technology include Nobel prize winner Hans Bethe (now deceased), Steven Chu, Dr. James Hansen, Dr. Charles Till, Dr. Eric Loewen, Congressman John Garamendi, Bill Gates, and even the President of MIT. Even the board of directors of the historically anti-nuclear Sierra Club has agreed that they will not oppose building an IFR!¶ Opposition is from OSTP and OMB. We don’t know who or why. It’s a mystery to all my sources. Frank von Hippel thinks you cannot make fast reactors cheaply or reliably and maintains that stance even when the facts show that not to be the case. Ernie Moniz at MIT thinks we shouldn’t build anything now, but do more R&D for the next several decades hoping we can find something better.¶ Bill Magwood, an Obama appointee to the NRC, would be a reasonable choice to provide an objective assessment of the IFR. He has no vested interested in the IFR, but having been the longest serving head of DOE civilian nuclear in history, is familiar with the pros and cons of the technology.¶ Should OSTP and OMB be making these key decisions behind closed doors? Is this really reflective of what the President wants? He’s stated publicly he wants the US to be a world leader in clean energy. Is putting our best technology on the shelf, but licensing the French and Japanese to build it (Joint Statement on Trilateral Cooperation in the area of Sodium-cooled Fast Reactors signed on October 4, 2010 by DOE), the best way for the US to achieve the leadership that Obama said he wanted?¶ I am happy to provide you with additional information.

## 2ac

### Solvency – AT: Licensing

#### NRC is rubber stamp for nuke licensing – will cave to industry pressure

Karl Grossman (full professor of journalism at the State University of New York College at Old Westbury. For more than 45 years he has pioneered the combination of investigative reporting and environmental journalism in a variety of media, writer for the Huffington Post) May 30, 2012 “USA’s Nuclear Regulatory Commission is into nuclear promotion rather than nuclear safety” http://nuclear-news.info/2012/06/04/usas-nuclear-regulatory-commission-is-into-nuclear-promotion-rather-than-nuclear-safety/

The resignation last week of the chairman of the U.S. Nuclear Regulatory Commission is another demonstration of the bankrupt basis of the NRC. Gregory Jaczko repeatedly called for the NRC to apply “lessons learned” from the Fukushima Daiichi nuclear plant disaster in Japan. And, for that, the nuclear industry — quite successfully — went after him fiercely. The New York Times, in an editorial over the weekend , said that President Obama’s choice to replace Jaczko, Allison Macfarlane, “will need to be as independent and aggressive as Dr. Jaczko.” That misses the institutional point. The NRC was created in 1974 when Congress abolished the U.S. Atomic Energy Commission after deciding that the AEC’s dual missions of promoting and at the same time regulating nuclear power were deemed a conflict of interest. The AEC was replaced by the NRC, which was to regulate nuclear power, and a Department of Energy was later formed to advocate for it. However, the same extreme pro-nuclear culture of the AEC continued on at the NRC. It has partnered with the DOE in promoting nuclear power. Indeed, neither the AEC, in its more than 25 years, nor the NRC, in its nearly 30 years, ever denied an application for a construction or operating license for a nuclear power plant anywhere, anytime in the United States. The NRC is a rubberstamp for the nuclear industry. “NRC stands for Nuclear Rubberstamp Commission,” says Kevin Kamps of the organization Beyond Nuclear. And it isn’t that Jaczko opposed nuclear power. “Greg is not anti-nuclear, but he’s pro-nuclear in a smart and considered way,” says Christopher Paine , director of the nuclear program at the Natural Resources Defense Council.

#### Gas supply crunch coming now – shale production ceilings and economics

Nelder, 12 [Chris, Smart Planet, February, Everything you know about shale gas is wrong, <http://www.smartplanet.com/blog/energy-futurist/everything-you-know-about-shale-gas-is-wrong/341>]

But now there’s even more bad news: U.S. gas production appears to have hit a production ceiling, and is actually declining in major areas. The startling revelation comes from a new [paper](http://www.theoildrum.com/node/8914) published today by Houston-based petroleum geologist and energy sector consultant Arthur Berman. Berman reached this conclusion by compiling his own production history of U.S. shale gas from a massive data set licensed from data provider HPDI. His well-by-well analysis found that total U.S. gas production has been on an “undulating plateau” since the beginning of 2009, and showed declines in some areas in 2011. This stands in stark contrast to recent data provided by the EIA, which shows shale gas production rising steadily for the past two years, and well into the future. The EIA’s forecast is bullish because it’s mainly a view of demand, without great regard for supply limits. But their historical supply data differs for a reason that will be no surprise to experienced observers: the data is bad. The EIA gets its data on shale gas production by sampling the reports of major operators, then applying a formula to estimate how much gas is actually being produced, according to Berman. This may explain why they only have official monthly historical production data for the [two years](http://www.eia.gov/dnav/ng/hist/ngm_epg0_fgs_nus_mmcfm.htm) (unofficially, [three](http://www.eia.gov/dnav/ng/ng_prod_shalegas_s1_a.htm)) of 2008 and 2009, and only annual data for 2010 and 2011. This has been a big red flag to me in my recent work on shale gas, accustomed as I am to EIA’s far more detailed and up-to-date monthly and weekly data on oil, and has made it nearly impossible to verify the claim that we’ve had “booming” gas production over the past two years. Data is also available directly from the states, but some states haveflawed reporting processes**,** the granularity and reporting frequency varies (as low as every six months, in the case of Pennsylvania), and ultimately the data isn’t available in a usable format. It’s also inaccurate and incomplete, as one Pittsburgh newspaper recently [found out](http://www.post-gazette.com/pg/12008/1202172-503-0.stm). Berman reached the same conclusion, noting in his paper that “the data that EIA makes available does not have sufficient resolution to evaluate individual plays or states.” So he had to build his own database. An unprofitable treadmill One reason for the recent slowdown in production growth is that “unconventional” shale gas wells have to make up for the decline of conventional gas wells, which has accelerated from 23 percent per year in 2001 to 32 percent per year today. The U.S. now needs to replace 22 billion cubic feet per day (Bcf/d) of production each year just to maintain flat supply. Currently, all shale gas plays together produce around 19 Bcf/d. The shift to unconventional gas has put us on a production treadmill: We have to keep drilling like mad to maintain output because unconventional wells are far less productive and shorter-lived than conventional gas wells. Berman observes that an average gas well in Texas in 2010 produces one-fifth as much gas as an average conventional gas well did in 1972. In 1972, 23,000 gas wells produced 7.5 trillion cubic feet in Texas; in 2010, it took 102,000 wells to produce 6.4 trillion cubic feet. Another reason was that the spurt of production created a gas glut and drove prices far below the level of profitability. Data from a January, 2012 [presentation](http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NDUxNzk4fENoaWxkSUQ9NDc2OTUwfFR5cGU9MQ==&t=1) by the CEO of gas operator Range Resources showed that gas needs to sell for at least $4 per million BTU in order for operators to turn a profit. Source: Jonathan Callahan, [The Oil Drum](http://www.theoildrum.com/node/8900). Data from Range Resources. Berman is certain that the $4 threshold applies to new drilling on existing plays only; after accounting for land leasing, overhead and debt service, the threshold would be much higher. In any case, we can see that production flattened out when prices fell below $4 at the beginning of 2009. Source: Arthur Berman. Data from Natural Gas Intelligence. A gas price below $3 spells real trouble for operators, and flagging production is but the first effect. The next is debt: According to analysis by ARC Financial Research, the 34 top U.S. publicly traded shale gas producers are currently carrying a combined $10 billion quarterly cash flow deficit. And finally, there will the destruction of forward supply, as new development grinds down. Financing further development with debt in this environment will be extremely difficult, and eventually even the joint-venture sugar daddies that have sustained operators over the past few months will get cold feet. Without a reversal in price, gas production is guaranteed to decline. The gas gold rush is over Indeed, Berman concludes that “the gold rush is over at least for now with the less commercial shale plays.” Within the major producing areas of the U.S., which account for 75 percent of production, all except Louisiana have been either flat or declining in recent years. Overall, he sees evidence that 80 percent of existing U.S. shale gas plays are already approaching peak production. Rig counts have been falling, and major operators such as Chesapeake Energy and ConocoPhilips have announced slowdowns in drilling in the last month. The two major plays that do not show evidence of peaking yet are the newer ones: the Marcellus Shale in Pennsylvania and the Haynesville Shale in Louisiana. To see the influence of these two plays on overall production, compare the first chart below, which shows production from all shale plays, to the second, which removes production from those two plays: Source: Arthur Berman Source: Chart by Chris Nelder, from Arthur Berman’s worksheets The Haynesville surpassed the Barnett Shale in Texas last year as the top-producing shale play in the U.S., but it may be reaching a production plateau now. Worse, Berman’s analysis finds that despite its impressive production, the Haynesville is among the least economic of the shale plays, requiring gas prices above $7.00 per thousand cubic feet to sustain new drilling profitably, and nearly $9.00 per thousand cubic feet after accounting for leasing and other costs. (One thousand cubic feet is roughly equivalent to one million BTU.) A word of caution is in order here: A one-year decline in production in an unprofitable environment is not proof that shale gas has “peaked.” It’s certainly possible that renewed drilling could bring higher production when gas prices rise again. The operative question in that case is when. If gas prices recover within the next year or two, it will be relatively easy to bring new wells online rapidly. But if gas prices languish for longer than that, the most productive “core” areas of the plays could become exhausted because the wells deplete so quickly. Without sustained new drilling to replace their production, by the time producers begin drilling again in the remaining, less productive prospects, an air pocket could form in the supply line. Disinformation and diffusion theory Berman admits that it’s strange for his bottom-up analysis to produce results that are so wildly divergent from the claims of the operators and the data offered by the EIA. “I ask myself: Where could we be wrong?” he explained. “We’ve looked at the individual wells and it looks like they’ll produce less gas than the operators say, so where could we be wrong? Likewise on cost: There are no retained earnings, so how could they be saying they’re profitable?” Having scrutinized the financial reports of operators, Berman concludes that operators are being honest with the SEC, because if they aren’t, somebody will go to jail. But then they’re telling a very different story to the public, and to investors, particularly regarding their costs. This isn’t necessarily nefarious; it’s really just a way of working around the natural risks associated with new resource development. They’re playing for the future, not for immediate profitability. Early wildcatters gambled on debt-fueled drilling with the hope that they’d be able to hold the leases long enough to see prices rise again and put them nicely in the black, or flip them at a profit to someone who could. And the profit picture is substantial: according to the Range Resources presentation, when gas is $6, they’ll be realizing a 135 percent internal rate of return. “I think these companies realize—clearly—that the U.S. is moving toward a gas economy,” Berman observes. “The natural gas industry has been very successful at screwing up the coal industry. . . a huge part of the demand is from the power generation business. The President now thinks, incorrectly, that we’ve got 100 years of natural gas. [Op’erators think] ‘If we can just get all this land held, drilled, etc., then in a couple of years when the price recovers we’re going to make a fortune’. . . and they’re right!” I am inclined to agree. My own analysis suggests that [gas is trouncing coal](http://www.smartplanet.com/blog/energy-futurist/regulation-and-the-decline-of-coal-power/275) in the power generation sector. I am also strongly [against exporting LNG](http://www.smartplanet.com/blog/energy-futurist/the-siren-song-of-lng-exports/313), because it will increase domestic costs across the board, another point on which Berman and I agree. “If they go through with the permits to export LNG, then that’s gonna seal it,” he remarked. “All you have to do is commit to 20-year contracts to ship a few bcf per day. . . I fear what’s really going to happen is that we’re going to have to start importing LNG.” Ultimately, we have to ask why there seems to be such an enormous disconnect between the reality of the production and reserve data, and the wild-eyed claims of operators and politicians. Berman’s answer is blunt: “We’re in a weird place where it’s not in anybody’s vested interest to say that things aren’t wonderful,” he said, and went on to relate a few stories of his encounters with politicians. They admitted to him, straight-up, that they can’t tell the public the truth about energy issues like gas reserves and peak oil because nobody wants to hear it, and they’ll just wind up getting voted out of office. “This gets back to basic diffusion theory,” Berman muses, “where only 5 percent of people base their decisions on information, while the other 95 percent make decisions on what everybody else thinks.” That sounds right to me. It benefits everyone involved to tell happy lies, and benefits no one to own up to the current reality. That is true for everyone from the operators right on up to the President. Perhaps in the end—like government—we’ll simply get the energy policy we deserve.

### Sodium

#### Meltdowns once ever 400,000 years

**Kirsch 9** [Steve Kirsch, founder and CEO of multiple tech companies collectively worth over %241 billion and MS in Electrical Engineering and Computer Science from MIT, November 2009, "Why We Should Build an Integral Fast Reactor Now,"]

¶ Q. Is it safe? How often can we expect to see a meltdown?¶ ¶ For the GE S-PRISM design, if the entire planet used IFRs, we can reasonably expect an accident once every 380,000 years according to the probabilistic risk scenarios calculated by GE.

#### Sodium is safe

**Brook 9** [“Response to an Integral Fast Reactor (IFR) critique”, 21 February 2009 by Barry Brook, professor in the School of Earth and Environmental Sciences at the University of Adelaide, where he holds the Sir Hubert Wilkins Chair of Climate Change]

4. Safety risks associated with use of sodium coolant.¶ [BWB] The liquid sodium would be housed in a reactor pool with an inert argon overtopping atmosphere. The room in which the secondary sodium loop exchanged heat with the water loop would also be housed in an argon-filled room – a room separate to the reactor (see below Appendix for more information).¶ [GS] ALMRs use liquid sodium for cooling and heat transfer, which makes the system intrinsically safer than one that uses water. That is because the molten sodium runs at atmospheric pressure, which means that there is no internal pressure to cause the type of accident that has to be carefully designed against in an LWR: a massive pipe rupture followed by “blowdown” of the coolant. Also, sodium is not corrosive (on steel) like water is.

#### Argon solves DA’s

**Till 11** [“PLENTIFUL ENERGY ¶ The Story of the Integral Fast Reactor¶ The complex history of a ¶ simple reactor technology, ¶ with emphasis on its ¶ scientific basis for non-specialists¶ CHARLES E. TILL, Nuclear physicist and associate lab director at Argonne National Laboratory West, and YOON IL CHANG”]

Its principal disadvantage is that it is highly chemically reactive with oxygen, in ¶ water or in air. It must not be exposed to either so it must be maintained in an inert ¶ gas environment. Argon, a relatively common noble gas, which itself is completely ¶ non-reactive and heavy enough to blanket surfaces and keep them blanketed, is the ¶ obvious choice to do this. Its opacity is little more than a nuisance; techniques have ¶ been developed over the years to deal with it.

### AT: SK DA

#### Wrong – transparency, ROK history, and government moderation disprove – plus North Korean transgressions prove its inevitable

**Lee, 12** - Lee Byong-Chul is a Senior Fellow at the Institute for Peace and Cooperation in Seoul. (Byong-chul, Asia Sentinel, 6/12, “US Must Rethink Stance on Korea Nuke Pact”

<http://www.asiasentinel.com/index.php?option=com_content&task=view&id=4586&Itemid=395>)

South Korea is a stable, pro-western country and has already signed a nuclear agreement with the US -- the agreement that has greatly contributed to the development of South Korean nuclear industry but which needs to reflect the changed environment of the global nuclear market as well as domestic demands in recent years. What’s more, Seoul is a signatory to the Nuclear Nonproliferation Treaty, which explicitly allows participants to enrich uranium for peaceful power production. And there is no denying that South Korea will likely reaffirm its willingness for transparency on all matters relating to the production of nuclear power plants.

Why should South Korea be denied the right to use its own technology to reprocess spent nuclear fuel? Why suspect this country of doing exactly what it has said it has no intention of doing? Why deny South Korean nuclear technology out of fear of some “worst-case scenario” that would see the current situation replaced by one that attempts to develop a bomb? It’s the Communist North Korea that America should have focused on for the proliferation of nuclear weapons, not its ally South Korea.

South Korea has been negotiating with the United States to resolve the direction and depth of the agreement. My assumption is that both countries have committed themselves to a dual-track approach: how to amend the existing nuclear agreement on the one hand and on the other, to research the pyro-processing technologies independently or cooperatively, one of the most hotly contested issues, which has been stalled for a long time.

Ranking with Japan in historic and economic significance, South Korea is a great believer in peace and stability in an uncertain region. Long ago, for example, the government expressed its unreserved support for peace and stability on the Korean peninsula with no regard to North Korea’s numerous violations over denuclearization, as if Washington negotiators are “straining at a gnat and swallowing a camel.”

Opponents of South Korean nuclear policy point out that there is a certain risk in allowing Seoul to reprocess spent fuel and enrich uranium because of its past record, but the risk in accepting Seoul’s request is far smaller. There is much more at stake here than American negotiators’ firm stance to ban the reprocessing of spent fuel. This is about the fundamental question: What is America to us?

Almost 30 years have gone since I entered university. Koreans’ perceptions of America are no longer shaped only by what America did during the 1950-53 Korean War. Sadly, however, plenty of conservative people still claim that “We should not forget that American blood in the Korean War had fertilized the land well.” Now is not the 1950s or 1980s. The memories of democratization, not to mention the war, are like shadows lengthening at dusk. Even those are bound to fade one day.

The US should strengthen those who want peace and stability in the region, since I don’t believe the nuclear sticks the US is using are the right leverage. The US must remember that pragmatic rationalists are here in the South Korean government, enjoying economic success and political freedom rather than the dire situation facing a nuclear armed North Korea. Like American negotiators, South Korean ones think that under a free and democratic political regime, the government is fundamentally wedded to stabilizing the system as a whole.

#### No full scale war

Paul **Stares**, CFR Center for Preventive Action Director and Conflict Prevention Senior Fellow, 8/12/20**10**, “Handling Tensions on the Korean Peninsula," http://www.cfr.org/publication/22788/handling\_tensions\_on\_the\_korean\_peninsula.html, access 12/7/2010

Other than firing some coastal artillery and detaining a South Korean fishing boat that recently strayed into North Korea waters, Pyongyang has responded primarily with belligerent rhetoric and apocalyptic warnings. The recent ROK-U.S. naval exercises, for example, elicited threats of a "retaliatory sacred war." But by historical standards, such bombast is unexceptional. The recent North Korean provocations also pale in comparison to earlier attacks and skirmishes, most notably during the late 1960s when, among other things, the Blue House--South Korea's presidential residence--was attacked, or in the 1980s when the South Korean cabinet was bombed during a visit to Burma.

These far-worse periods of inter-Korean tensions never ignited another war, and the incentives to prevent this from happening are even greater today. South Korea fears losing its hard-won prosperity, while a much weaker North knows that it would never survive another major conflict.

#### No link and turn – 1AC Kirsch evidence says that America will use nuclear leverage to get IFRs retrofitted on coal plants in other countries, but the waste will be reprocessed in US facilities and then used as fuel elsewhere – means that there’s no internal to their accidents args

#### No link – the plan’s leverage is economic in origin, not political, which already exists now – Obama’s stance is inevitable now, so only the plan can solve by promoting safe reprocessing

**Viski 12** [“It's Not as Easy as 1-2-3 : The Obama Team Fights over How to Promote Nuclear Energy Without Promoting Nuclear Weapons”, Foreign Policy, Andrea, foreign policy analyst, August 1, 2012]

In 2009, the United States seemed to signal a hard-line approach when it agreed to cooperate with the United Arab Emirates (UAE) on civilian nuclear technology only on the condition that the country not pursue the ability to enrich uranium to make fresh nuclear fuel or to reprocess plutonium from spent nuclear fuel to recycle it in reactors. These technologies, as every casual Iran watcher now knows, are the same as those used to make fissile material for a nuclear bomb. Officials from George W. Bush's administration subsequently described the UAE pledge as the "gold standard" for new nuclear cooperation accords -- known as "123 agreements."¶ The Obama administration has been more hesitant, saying instead that each new 123 agreement would be negotiated on a case-by-case basis. In other words, the administration would try to replicate the ban on enrichment and reprocessing when possible, while strongly suggesting that the UAE was a unique circumstance. That disappointed many nonproliferation experts -- both within the administration and without -- who believed that Washington was surrendering an opportunity to stem the spread of enrichment and reprocessing technology, even as the president continued to warn of the danger from weapons-usable nuclear material falling into the wrong hands. The gold standard languished in another policy review while the administration continued to negotiate 123 agreements -- until last week anyway, when, according to a report published in National Journal, the State Department made a play for a new 123 agreement with Taiwan.¶ The Obama administration largely finds itself an accidental architect of the new civil nuclear order. In addition to a new wave of countries seeking nuclear help from the United States, many 123 agreements that were negotiated 30 years ago -- during the last wave of enthusiasm for nuclear power -- will expire between now and 2014. When this flurry of activity ends, the United States will have negotiated more than a dozen nuclear cooperation agreements in a four-year period, many with the most important emerging nuclear powers. Dick Stratford, a senior State Department official, told a conference that he carried around a little list in his pocket because he had trouble keeping all the negotiations straight.¶ Although the moment is largely one of circumstance, the Obama administration has revealed a distinct philosophical approach, taking a market-oriented approach to discouraging new countries from building their own facilities for enrichment and reprocessing (sometimes called "ENR"). In practice this means exploring how to offer fuel-cycle services at reasonable prices and providing assurances that states that rely on the market, rather than their own capabilities, will not have their supply of fuel disrupted. The thinking goes that the United States can best discourage states from developing their own enrichment and reprocessing capabilities by ensuring that the nuclear industry provides such comprehensive fuel services as part of any agreement to sell nuclear reactors. If that helps U.S. industry and its international partners, all the better. (This is not yet a capability that U.S. industry can provide, particularly in the arena of taking back spent nuclear fuel.) The Obama administration has also supported the creation of separate U.S. and International Atomic Energy Agency (IAEA) "fuel banks" that would provide states that relied on the market a supplier of last resort in the event of a disruption in the supply of nuclear fuel.

#### **No ENR enforcement – makes reprocessing inevitable**

**Viski 12** [“It's Not as Easy as 1-2-3 : The Obama Team Fights over How to Promote Nuclear Energy Without Promoting Nuclear Weapons”, Foreign Policy, Andrea, foreign policy analyst, August 1, 2012]

So far, however, the administration has been reluctant to put the squeeze on potential partners. Many Obama officials took the view outlined by Poneman in his article -- that asking states to renounce ENR could make the situation worse. (It is important to note that I am not aware of Poneman's view inside the interagency deliberations.) So the administration has largely avoided pressuring states to renounce enrichment and reprocessing capabilities. Despite early talk of the "gold standard," this January the administration announced it would take what officials described as a case-by-case approach. In bureaucratic terms, this amounts to having no standard at all. It is hard to imagine a less restrictive policy. I suppose the administration could announce it would not even try. As it is, they will try -- but not very hard.

### Conditionality Bad 2AC

#### Conditionality is bad – generates 2ac strategic skew by disincentivizng best use of offense – creates argumentative irresponsibility making debate poor advocate training – rigorous pre-round research solves offense

### Science Diplomacy Add-on

**US federal nuclear leadership is key to science diplomacy**

**AAAS ‘8** ((American Association for the Advancement of Science, 10 July 2008, “Energy Expert Calls on United States to Take Leadership in Nuclear Energy Framework”, <http://www.aaas.org/news/releases/2008/0710nuclear_energy.shtml>, [Miller])

**The** next U.S. **president will have a historic opportunity to exercise leadership in** increasing the global investment in **nuclear** technology**, energy expert Victor Reis said** at a AAAS briefing. But the stakes are higher than just finding an alternative to the rising price of oil and coal. Reis, a senior advisor to Secretary of Energy Samuel W. Bodman, said that a well-designed nuclear energy framework could drive global growth by bringing affordable, reliable energy to the developing world, address climate change through clean energy production, and promote international security by securing nuclear materials around the world. **"By increasing the civilian nuclear enterprise, the** next U.S. **president can make use of a historic opportunity to simultaneously attack the biggest interlocking issues that society will face for the next 50 years**," said Reis. Speaking at AAAS headquarters in Washington, D.C., Reis said that around 1.6 billion people, or 25% of the world's population, live without access to electricity and 2.4 billion, or 35%, rely on traditional, carbon-rich biomass like wood for their energy needs because they have no access to modern fuels. Because experts have found a strong correlation between electricity use and almost every statistic for quality of life including life expectancy, literacy, education, and gross domestic product per capita, Reis said, it is imperative that developed nations bring power to the world's neediest citizens. In addition to being an effective technology to meet the future energy needs of the developing world, Reis said that nuclear power generation is better for the environment because it does not release carbon dioxide into the atmosphere. In order to meet a conservative target of maintaining atmospheric carbon dioxide levels below 550 parts per million—a goal echoed in a 2008 report by the Intergovernmental Panel on Climate Change—while still fulfilling the world's energy needs, Reis says that governments must invest heavily in nuclear technology. "A lot of people around the world don't have access to electricity, and you don't want them to burn carbon-rich sources like coal," said Reis, adding that he doesn't see "how you can realistically address climate change without nuclear power." Reis said he is encouraged that many politicians, including those running for president, recognize climate change as among the most pressing issues for their first term in office. Sponsored by the AAAS Center for Science, Technology, and Security Policy, the 2 June briefing on nuclear energy brought together scientists, policy makers, students, and the media. At the event, Benn Tannenbaum, the Center's associate program director, said that he has noticed an increasing amount of opinion and commentary articles on nuclear technology in the nation's largest newspapers, suggesting that it is becoming a heavily discussed issue. "Nuclear energy has tremendous implications for the coming century," said Tannenbaum. "It's absolutely that vital that policy makers make informed decisions with the help of scientists to determine if and how nuclear energy programs move forward. The stakes are incredibly high." Reis said that regardless of U.S. domestic plans to increase nuclear energy production, a widespread global initiative to generate electricity using nuclear power is already underway. Around the world, there are already 439 nuclear reactors in 31 countries, representing 16% of the world's total electricity production. In the United States alone, there are 104 reactors representing 20% of domestic electricity production. Reis added that there are around 93 nuclear power-generating facilities on order or planned globally. He pointed out, however, that there are many challenges to increasing nuclear power around the world, most notably ensuring that radioactive materials used in nuclear power production are not obtained by terrorists or rogue states. One controversial solution announced in 2006 by the administration of U.S. President George W. Bush is the Global Nuclear Energy Partnership (GNEP), an international agreement that has been signed by 21 nations including the United States, the United Kingdom, Russia, China, and France. Under GNEP, the United States and other nations with advanced civilian nuclear energy production facilities would be responsible for safely reprocessing spent nuclear fuel from energy production and then would export it to be reused for other nations' energy programs. This would reduce the number of nuclear enrichment and reprocessing sites around the world, Reis said. He said that the Reliable Replacement Warhead (RRW) program, announced by Bush in 2004, would also help to significantly reduce the overall number of weapons in the U.S. nuclear arsenal while modernizing their design. Weapons experts believe that this may encourage other nations including Russia to reduce their stockpiles. While some experts like former Secretaries of State George P. Shultz and Henry A. Kissinger suggest that nations should aim to achieve a nuclear weapons-free world, others such as former Secretary of Defense Harold Brown and former Director of Central Intelligence John Deutch believe that it is an unreasonable goal and poor policy. Beyond the proliferation of enriched nuclear material, many critics of nuclear power production in the United States fear the increased amount of toxic materials that need to be transported from the reactors to storage after they are used. Reis said he understood those concerns but pointed to the 100 million miles of safe travel that the Department of Energy has overseen for the nation's nuclear weapons and energy materials. He said the same procedures can be applied to commercial nuclear energy. In addition, many nuclear power critics fear the consequences of reactor accidents like the 1986 Chernobyl accident in the Soviet Union and the 1979 Three Mile Island accident near Harrisburg, Pennsylvania. Reis once again pointed out the globe's "remarkable" safety record during more than 12,000 reactor-years of operation with significant improvements made to world's nuclear infrastructure following the incidents. The Three Mile Island incident caused no documented injuries and led to important improvements in U.S. and global safety operations, he said. He added that the Chernobyl disaster involved a reactor that was poorly designed and did not have sufficient containment, which lead to a new generation of reactors with higher safety specifications. Another significant issue with nuclear energy production is where to store the radioactive materials. One controversial proposal is to transport all waste to the Yucca Mountain Repository, a geological storage facility1000 feet deep in the Nevada desert. While the plan has its advantages, such as the ability to retrieve the materials after they are deposited, Reis said that many find the program "geographically unfair" because it makes one region assume the entire burden of the nation's nuclear waste. Regardless of the decision to increase nuclear energy production over the coming decades, Reis said that the Department of Energy (DOE) is able and ready to meet the new challenges of the 21st Century. With over 12,440 Ph.D. scientists, 25,000 visiting scientists, and 17 laboratories across the country, Reis said that **the DOE laboratories "represent one of the biggest scientific collections in the world [and] maybe in the history of civilization."** Beyond access to some of the **top scientific minds and computers** in the world, Reis highlighted several major DOE achievements including **maintaining six top research facilities**, certifying the U.S. nuclear weapons arsenal without underground testing, **helping other nations** secure their nuclear materials, and cleaning up the Rocky Flats weapons production facility and helping convert it into a wildlife refuge. In addition, Reis said that the DOE has nine years of successful operation of its Waste Isolation Pilot Plant (WIPP). Located in Carlsbad, New Mexico, the facility is an underground radioactive waste repository serving as a frontrunner for the Yucca Mountain site. "**Because of the implications of nuclear energy, good or bad, it is important that the** next **administration seize the opportunity for global leadership by using the Department of Energy's world leading assets**," Reis said. Reis added that **the nuclear enterprise could become a vehicle for international cooperation**, echoing a December 1953 speech by U.S. President Dwight D. Eisenhower in which he pledged to devote the nation's "entire heart and mind to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life."

**Science diplomacy accesses every impact**

**Fedoroff ‘8** (Nina, Science and Technology Advisor to the Secretary of State, “Making Science Diplomacy more Effective”, Testimony before the House Science Subcommittee on Research and Science Education, 4-2, <http://legislative.nasa.gov/hearings/4-2-08%20Fedoroff.pdf>)

**Science by its nature facilitates diplomacy because it strengthens political relationships, embodies powerful ideals, and creates opportunities** for all. The global scientific community embraces principles Americans cherish: transparency, meritocracy, accountability, the objective evaluation of evidence, and broad and frequently democratic participation. Science is inherently democratic, respecting evidence and truth above all. Science is also a common global language, able to bridge deep political and religious divides. Scientists share a common language. Scientific interactions serve to keep open lines of communication and **cultural understanding**. As scientists everywhere have a common evidentiary external reference system, members of ideologically divergent societies can use the common language of science to cooperatively address both domestic and the increasingly trans-national and global problems confronting humanity in the 21st century. There is a growing recognition that science and technology will increasingly drive the successful economies of the 21st century. Science and technology provide an immeasurable benefit to the U.S. by bringing scientists and students here, especially from developing countries, where they see democracy in action, make friends in the international scientific community, become familiar with American technology, and contribute to the U.S. and global economy. For example, in 2005, over 50% of physical science and engineering graduate students and postdoctoral researchers trained in the U.S. have been foreign nationals. Moreover, many foreign-born scientists who were educated and have worked in the U.S. eventually progress in their careers to hold influential positions in ministries and institutions both in this country and in their home countries. They also contribute to U.S. scientific and technologic development: According to the National Science Board`s 2008 Science and Engineering Indicators, 47% of full-time doctoral science and engineering faculty in U.S. research institutions were foreign-born. Finally, some types of science - particularly those that address the grand challenges in science and technology - are inherently international in scope and collaborative by necessity. The ITER Project, an international fusion research and development collaboration, is a product of the thaw in superpower relations between Soviet President Mikhail Gorbachev and U.S. President Ronald Reagan. This reactor will harness the power of nuclear fusion as a possible new and viable energy source by bringing a star to earth. ITER serves as a symbol of international scientific cooperation among key scientific leaders in the developed and developing world - Japan, Korea, China, E.U., India, Russia, and United States - representing 70% of the world`s current population. The recent elimination of funding for FY08 U.S. contributions to the ITER project comes at an inopportune time as the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project had entered into force only on October 2007. The elimination of the promised U.S. contribution drew our allies to question our commitment and credibility in international cooperative ventures. More problematically, it jeopardizes a platform for reaffirming U.S. relations with key states. It should be noted that even at the height of the cold war, the United States used science diplomacy as a means to maintain communications and avoid misunderstanding between the world`s two nuclear powers - the Soviet Union and the United States. In a complex multi-polar world, relations are more challenging, the threats perhaps greater, and the need for engagement more paramount. Using Science Diplomacy to Achieve National Security Objectives The welfare and stability of countries and regions in many parts of the globe require[s] a concerted effort by the developed world to address the causal factors that render countries fragile and cause states to fail. Countries that are unable to defend their people against starvation, or fail to provide economic opportunity, are susceptible to extremist ideologies, autocratic rule, and abuses of human rights. As well, the world faces common threats, among them **climate change, energy and water shortages, public health emergencies, environmental degradation, poverty, food insecurity, and religious extremism**. These threats can undermine the national security of the United States, both directly and indirectly. Many are blind to political boundaries, **becoming regional or global threats**. The United States has no monopoly on knowledge in a globalizing world and the scientific challenges **facing humankind** are enormous. Addressing these common challenges demands common solutions and necessitates **scientific cooperation**, common standards, and common goals. We must increasingly harness the power of American ingenuity in science and technology through strong partnerships with the science community in both academia and the private sector, in the U.S. and abroad among our allies, to advance U.S. interests in foreign policy. There are also important challenges to the ability of states to supply their populations with sufficient food. The still-growing human population, rising affluence in emerging economies, and other factors have combined to create unprecedented pressures on global prices of staples such as edible oils and grains. Encouraging and promoting the use of contemporary molecular techniques in crop improvement is an essential goal for US science diplomacy. An essential part of the war on terrorism is a war of ideas. The creation of economic opportunity can do much more to combat the rise of fanaticism than can any weapon. The war of ideas is a war about rationalism as opposed to irrationalism. Science and technology put us firmly on the side of rationalism by providing ideas and opportunities that improve people`s lives. We may use the recognition and the goodwill that science still generates for the United States to achieve our diplomatic and developmental goals. Additionally, the Department continues to use science as a means to reduce the proliferation of the weapons` of mass destruction and prevent what has been dubbed `brain drain`. Through cooperative threat reduction activities, former weapons scientists redirect their skills to participate in peaceful, collaborative international research in a large variety of scientific fields. In addition, new global efforts focus on improving **biological**, chemical, and **nuclear security** by promoting and implementing **best scientific practices as a means to enhance security, increase global partnerships, and create sustainability.**

### EIS CP

**No extinction**

**O’Neill 4** O’Neill 8/19/2004 [Brendan, “Weapons of Minimum Destruction” http://www.spiked-online.com/Articles/0000000CA694.htm]

David C Rapoport*,* professor of political science at University of California, Los Angeles and editor of the Journal of Terrorism and Political Violence, has examined what he calls 'easily available evidence' relating to the historic use of chemical and biological weapons. He found something surprising - such weapons do not cause mass destruction. Indeed, whether used by states, terror groups or dispersed in industrial accidents, they tend to be far less destructive than conventional weapons. 'If we stopped speculating about things that might happen in the future and looked instead at what has happened in the past, we'd see that our fears about WMD are misplaced', he says. Yet such fears remain widespread. Post-9/11, American and British leaders have issued dire warnings about terrorists getting hold of WMD and causing mass murder and mayhem. President George W Bush has spoken of terrorists who, 'if they ever gained weapons of mass destruction', would 'kill hundreds of thousands, without hesitation and without mercy' (1). The British government has spent £28million on stockpiling millions of smallpox vaccines, even though there's no evidence that terrorists have got access to smallpox, which was eradicated as a natural disease in the 1970s and now exists only in two high-security labs in America and Russia (2). In 2002, British nurses became the first in the world to get training in how to deal with the victims of bioterrorism (3). The UK Home Office's 22-page pamphlet on how to survive a terror attack, published last month, included tips on what to do in the event of a 'chemical, biological or radiological attack' ('Move away from the immediate source of danger', it usefully advised). Spine-chilling books such as Plague Wars: A True Story of Biological Warfare, The New Face of Terrorism: Threats From Weapons of Mass Destruction and The Survival Guide: What to Do in a Biological, Chemical or Nuclear Emergency speculate over what kind of horrors WMD might wreak. TV docudramas, meanwhile, explore how Britain might cope with a smallpox assault and what would happen if London were 'dirty nuked' (4). The term 'weapons of mass destruction' refers to three types of weapons: nuclear, chemical and biological. A chemical weapon is any weapon that uses a manufactured chemical, such as sarin, mustard gas or hydrogen cyanide, to kill or injure. A biological weapon uses bacteria or viruses, such as smallpox or anthrax, to cause destruction - inducing sickness and disease as a means of undermining enemy forces or inflicting civilian casualties. We find such weapons repulsive, because of the horrible way in which the victims convulse and die - but they appear to be less 'destructive' than conventional weapons. 'We know that nukes are massively destructive, there is a lot of evidence for that', says Rapoport. But when it comes to chemical and biological weapons, 'the evidence suggests that we should call them "weapons of minimum destruction", not mass destruction', he says. Chemical weapons have most commonly been used by states, in military warfare. Rapoport explored various state uses of chemicals over the past hundred years: both sides used them in the First World War; Italy deployed chemicals against the Ethiopians in the 1930s; the Japanese used chemicals against the Chinese in the 1930s and again in the Second World War; Egypt and Libya used them in the Yemen and Chad in the postwar period; most recently, Saddam Hussein's Iraq used chemical weapons, first in the war against Iran (1980-1988) and then against its own Kurdish population at the tail-end of the Iran-Iraq war. In each instance, says Rapoport, chemical weapons were used more in desperation than from a position of strength or a desire to cause mass destruction. 'The evidence is that states rarely use them even when they have them', he has written. 'Only when a military stalemate has developed, which belligerents who have become desperate want to break, are they used.' (5) As to whether such use of chemicals was effective, Rapoport says that at best it blunted an offensive - but this very rarely, if ever, translated into a decisive strategic shift in the war, because the original stalemate continued after the chemical weapons had been deployed. He points to the example of Iraq. The Baathists used chemicals against Iran when that nasty trench-fought war had reached yet another stalemate. As Efraim Karsh argues in his paper 'The Iran-Iraq War: A Military Analysis': 'Iraq employed [chemical weapons] only in vital segments of the front and only when it saw no other way to check Iranian offensives. Chemical weapons had a negligible impact on the war, limited to tactical rather than strategic [effects].' (6) According to Rapoport, this 'negligible' impact of chemical weapons on the direction of a war is reflected in the disparity between the numbers of casualties caused by chemicals and the numbers caused by conventional weapons. It is estimated that the use of gas in the Iran-Iraq war killed 5,000 - but the Iranian side suffered around 600,000 dead in total, meaning that gas killed less than one per cent. The deadliest use of gas occurred in the First World War but, as Rapoport points out, it still only accounted for five per cent of casualties. Studying the amount of gas used by both sides from1914-1918 relative to the number of fatalities gas caused, Rapoport has written: 'It took a ton of gas in that war to achieve a single enemy fatality. Wind and sun regularly dissipated the lethality of the gases. Furthermore, those gassed were 10 to 12 times as likely to recover than those casualties produced by traditional weapons.' (7) Indeed, Rapoport discovered that some earlier documenters of the First World War had a vastly different assessment of chemical weapons than we have today - they considered the use of such weapons to be preferable to bombs and guns, because chemicals caused fewer fatalities. One wrote: 'Instead of being the most horrible form of warfare, it is the most humane, because it disables far more than it kills, ie, it has a low fatality ratio.' (8) 'Imagine that', says Rapoport, 'WMD being referred to as more humane'. He says that the contrast between such assessments and today's fears shows that actually looking at the evidence has benefits, allowing 'you to see things more rationally'. According to Rapoport, even Saddam's use of gas against the Kurds of Halabja in 1988 - the most recent use by a state of chemical weapons and the most commonly cited as evidence of the dangers of 'rogue states' getting their hands on WMD - does not show that unconventional weapons are more destructive than conventional ones. Of course the attack on Halabja was horrific, but he points out that the circumstances surrounding the assault remain unclear. 'The estimates of how many were killed vary greatly', he tells me. 'Some say 400, others say 5,000, others say more than 5,000. The fighter planes that attacked the civilians used conventional as well as unconventional weapons; I have seen no study which explores how many were killed by chemicals and how many were killed by firepower. We all find these attacks repulsive, but the death toll may actually have been greater if conventional bombs only were used. We know that conventional weapons can be more destructive.' Rapoport says that terrorist use of chemical and biological weapons is similar to state use - in that it is rare and, in terms of causing mass destruction, not very effective. He cites the work of journalist and author John Parachini, who says that over the past 25 years only four significant attempts by terrorists to use WMD have been recorded. The most effective WMD-attack by a non-state group, from a military perspective, was carried out by the Tamil Tigers of Sri Lanka in 1990. They used chlorine gas against Sri Lankan soldiers guarding a fort, injuring over 60 soldiers but killing none. The Tamil Tigers' use of chemicals angered their support base, when some of the chlorine drifted back into Tamil territory - confirming Rapoport's view that one problem with using unpredictable and unwieldy chemical and biological weapons over conventional weapons is that the cost can be as great 'to the attacker as to the attacked'. The Tigers have not used WMD since.

#### Perm do the CP

#### Perm do both

#### Doesn’t solve –

#### A. One time consultation

**Wasserman 11** (Cheryl, Associate Director for Policy Analysis, Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency, “ENFORCEMENT OF ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS” Ninth International Conference on Environmental Compliance and Enforcement 2011, <http://inece.org/conference/9/proceedings/57_Wasserman.pdf> MGE)

These distinctions can be important to the outcome of the EIA process. Too much emphasis on the adequacy of the EIA document or a one-time determination of “environmental feasibility” reinforces the inadequate attention to ongoing compliance with commitments. All too often EIA requirements fail because they are perceived and implemented as a one-time event.

#### B. Congress says no

**Koenig 2011** (Robert, 10/15, “Congress Seems Frozen as Climate Change evidence accumulates” <http://www.stlbeacon.org/issues-politics/280-washington/114206-congress-seems-frozen-as-climate-change-evidence-accumulates>)

Those waves had little impact on Capitol Hill, however. For the 112th Congress is awash in climate-change skepticism -- in some cases, outright denial. Even though some other nations have taken action, Congress has blocked significant U.S. action to slow the greenhouse gas emissions that most experts believe hasten the process of climate change. "We are the single country in the world that is supposed to be scientific and technically adept, but has a major movement that denies" climate change, said Peter Raven, president emeritus of the Missouri Botanical Garden and an internationally known botanist. Raven, a former president of the American Association for the Advancement of Science, a recipient of the National Medal of Science and a member of the National Academy of Sciences, believes the scientific evidence for global climate change is "overwhelming." He served on a National Research Council panel that warned earlier this year -- in the final report of the America's Climate Choices project -- that every ton of greenhouse gases emitted into the atmosphere intensifies the risks related to climate change. The report called for more action to try to limit the extent of climate change and prepare to adapt to its impacts. "The conclusion of the scientific community is clearly that the climate is changing rapidly -- not only in temperature but in other ways as well -- and that human beings are the major factor driving it," Raven told the Beacon. But that conclusion appears to have little impact in the current Congress, especially in the U.S. House. There, leaders of the Energy and Commerce Committee have mounted a campaign this year to block or roll back several Environmental Protection Agency regulations on emissions -- some of which exacerbate climate change. While the House has passed several bills to stop such EPA rules, the Senate so far has blocked them. While he says that intelligent people can disagree on what steps should be taken to slow global warming, Raven worries that "if we make those [issues] political footballs, we would be fostering a kind of anti-science or even anti-intellectual attitude that will make it very difficult for us to be world leaders in science and technology." Some lawmakers in Washington agree with him. U.S. Rep. Henry Waxman, D-Ca., the top Democrat (and former chairman) on the Energy and Commerce Committee, told the Center for American Progress: "I have never been in a Congress where there was such an overwhelming disconnect between science and policy."

#### C. Obama says no

**Cappiello 2011 -** Dina Cappiello is an award-winning environmental journalist who follows the story looking for specific, factual information about environmental problems that communities need in order to push for change (“Gore: On Global Warming, Obama Has Changed Little” 6/22, http://abcnews.go.com/Politics/wireStory?id=13900390)

The Democrats' leading environmental messenger, Al Gore, is declaring that President Barack Obama has failed to lead on the issue of global warming. In a 7,000-word essay posted online Wednesday by Rolling Stone magazine, Gore says the president hasn't stood up for "bold action" on the problem and has done little to move the country forward since he replaced Republican President George W. Bush. Bush infuriated environmentalists by resisting mandatory controls on the pollution blamed for climate change, despite overwhelming scientific evidence that the burning of fossil fuels is responsible. The scientific case has only gotten stronger since, Gore argues, but Obama has not used it to force significant change. "Obama has never presented to the American people the magnitude of the climate crisis," Gore says. "He has not defended the science against the ongoing withering and dishonest attacks. Nor has he provided a presidential venue for the scientific community ... to bring the reality of the science before the public." 

Gore does credit Obama's political appointees with making hundreds of changes that have helped move the country "forward slightly" on the climate issue, but says the president "has simply not made the case for action." He is the second Clinton administration official this month to express disappointment with Obama on environmental issues. Former Interior Secretary Bruce Babbitt, in a speech in early June, said Obama had yet to take up the "mantle of land and water conservation...in a significant way." Gore's comments mark a turnaround for the nation's most prominent global warming advocate, whose work on the climate problem has earned him a Nobel Prize and was adapted into an Oscar-winning documentary.

#### D. Delays

**Greenwire 2009** (“NEPA reviews shouldn't delay stimulus projects, experts say” March 24th, http://www.eenews.net/public/Greenwire/2009/03/24/2)

If the economy flounders despite the massive stimulus package, don't blame the federal law that forces government agencies to review their projects' environmental impacts. So say National Environmental Policy Act experts like Nicholas Yost, who led the drafting of NEPA regulations during the Carter administration. The preparation of environmental impact statements under NEPA takes almost three-and-a-half years -- much longer than Yost and others say is needed. The process, they say, can be sped up with strict deadlines, strong leadership from agency chiefs and increased resources and personnel to do reviews.

Perm do the plan and require an EIS for

#### Links to politics

**Rosenbaum 2005** - Professor of Political Science at Univ of Florida (Walter A, *Environmental Policymaking*, Ed. Hatch, p200-201)

In many instances, the EIS process is an early warning system for environmental advocacy and science communities, even though public involvement in the process is often more restrictive than its authors intended. The statutory and regulatory requirements for early public disclosure and review of the agency EIS statements often provide interested and affected parties with a translation of agency programs into comprehensible and relevant language which, in turn, incites political mobilization. This public disclosure is valuable not only to the Washington-based national organizations (that sometimes employ specialized staff for EIS oversight) but especially to smaller state and local organizations otherwise lacking the resources to acquire and interpret the complex and often (deliberately) mystifying, bureaucratic, syntax-adorning program descriptions.

### Kritik

#### Perm do the plan and \_\_\_\_\_ —either the perm solves or the alt does nothing

#### Framework – the k needs to prove the whole plan is bad– any other interp moots aff offense and decreases policy education

#### State focused nuclear power solutions key – solves their impact better

Nordhaus 11, chairman – Breakthrough Instiute, and Shellenberger, president – Breakthrough Insitute, MA cultural anthropology – University of California, Santa Cruz, 2/25/‘11

(Ted and Michael, <http://thebreakthrough.org/archive/the_long_death_of_environmenta>)

Tenth, we are going to have to get over our suspicion of technology, especially nuclear power. There is no credible path to reducing global carbon emissions without an enormous expansion of nuclear power. It is the only low carbon technology we have today with the demonstrated capability to generate large quantities of centrally generated electrtic power. It is the low carbon of technology of choice for much of the rest of the world. Even uber-green nations, like Germany and Sweden, have reversed plans to phase out nuclear power as they have begun to reconcile their energy needs with their climate commitments. Eleventh, we will need to embrace again the role of the state as a direct provider of public goods. The modern environmental movement, borne of the new left rejection of social authority of all sorts, has embraced the notion of state regulation and even creation of private markets while largely rejecting the generative role of the state. In the modern environmental imagination, government promotion of technology - whether nuclear power, the green revolution, synfuels, or ethanol - almost always ends badly. Never mind that virtually the entire history of American industrialization and technological innovation is the story of government investments in the development and commercialization of new technologies. Think of a transformative technology over the last century - computers, the Internet, pharmaceutical drugs, jet turbines, cellular telephones, nuclear power - and what you will find is government investing in those technologies at a scale that private firms simply cannot replicate. Twelveth, big is beautiful. The rising economies of the developing world will continue to develop whether we want them to or not. The solution to the ecological crises wrought by modernity, technology, and progress will be more modernity, technology, and progress. The solutions to the ecological challenges faced by a planet of 6 billion going on 9 billion will not be decentralized energy technologies like solar panels, small scale organic agriculture, and a drawing of unenforceable boundaries around what remains of our ecological inheritance, be it the rainforests of the Amazon or the chemical composition of the atmosphere. Rather, these solutions will be: large central station power technologies that can meet the energy needs of billions of people increasingly living in the dense mega-cities of the global south without emitting carbon dioxide, further intensification of industrial scale agriculture to meet the nutritional needs of a population that is not only growing but eating higher up the food chain, and a whole suite of new agricultural, desalinization and other technologies for gardening planet Earth that might allow us not only to pull back from forests and other threatened ecosystems but also to create new ones. The New Ecological Politics The great ecological challenges that our generation faces demands an ecological politics that is generative, not restrictive. An ecological politics capable of addressing global warming will require us to reexamine virtually every prominent strand of post-war green ideology. From Paul Erlich's warnings of a population bomb to The Club of Rome's "Limits to Growth," contemporary ecological politics have consistently embraced green Malthusianism despite the fact that the Malthusian premise has persistently failed for the better part of three centuries. Indeed, the green revolution was exponentially increasing agricultural yields at the very moment that Erlich was predicting mass starvation and the serial predictions of peak oil and various others resource collapses that have followed have continue to fail. This does not mean that Malthusian outcomes are impossible, but neither are they inevitable. We do have a choice in the matter, but it is not the choice that greens have long imagined. The choice that humanity faces is not whether to constrain our growth, development, and aspirations or die. It is whether we will continue to innovate and accelerate technological progress in order to thrive. Human technology and ingenuity have repeatedly confounded Malthusian predictions yet green ideology continues to cast a suspect eye towards the very technologies that have allowed us to avoid resource and ecological catastrophes. But such solutions will require environmentalists to abandon the "small is beautiful" ethic that has also characterized environmental thought since the 1960's. We, the most secure, affluent, and thoroughly modern human beings to have ever lived upon the planet, must abandon both the dark, zero-sum Malthusian visions and the idealized and nostalgic fantasies for a simpler, more bucolic past in which humans lived in harmony with Nature.

#### Turn—plan is key to effective energy development which solves the risk of unjustified environmental actions—either the plan is an internal link turn or the environment is an extinction disad to the alt

#### Prefer util

Cummiskey 90 – Professor of Philosophy, Bates (David, Kantian Consequentialism, Ethics 100.3, p 601-2, p 606, jstor, AG)

We must not obscure the issue by characterizing this type of case as the sacrifice of individuals for some abstract "social entity." It is not a question of some persons having to bear the cost for some elusive "overall social good." Instead, the question is whether some persons must bear the inescapable cost for the sake of other persons. Nozick, for example, argues that "to use a person in this way does not sufficiently respect and take account of the fact that he is a separate person, that his is the only life he has."30 Why, however, is this not equally true of all those that we do not save through our failure to act? By emphasizing solely the one who must bear the cost if we act, one fails to sufficiently respect and take account of the many other separate persons, each with only one life, who will bear the cost of our inaction. In such a situation, what would a conscientious Kantian agent, an agent motivated by the unconditional value of rational beings, choose? We have a duty to promote the conditions necessary for the existence of rational beings, but both choosing to act and choosing not to act will cost the life of a rational being. Since the basis of Kant's principle is "rational nature exists as an end-in-itself' (GMM, p. 429), the reasonable solution to such a dilemma involves promoting, insofar as one can, the conditions necessary for rational beings. If I sacrifice some for the sake of other rational beings, I do not use them arbitrarily and I do not deny the unconditional value of rational beings. **Persons** may **have "dignity**, an unconditional and incomparable value" that transcends any market value (GMM, p. 436), **but**, as rational beings, persons **also** have **a fundamental equality which dictates that some must** sometimes **give way for the sake of others.** The formula of the end-in-itself thus does not support the view that we may never force another to bear some cost in order to benefit others. If one focuses on the equal value of all rational beings, then equal consideration dictates that one sacrifice some to save many. [continues] According to Kant, the objective end of moral action is the existence of rational beings. Respect for rational beings requires that, in deciding what to do, one give appropriate practical consideration to the unconditional value of rational beings and to the conditional value of happiness. Since agent-centered constraints require a non-value-based rationale, the most natural interpretation of the demand that one give equal respect to all rational beings lead to a consequentialist normative theory. We have seen that there is no sound Kantian reason for abandoning this natural consequentialist interpretation. In particular, a consequentialist interpretation does not require sacrifices which a Kantian ought to consider unreasonable, and it does not involve doing evil so that good may come of it. It simply requires an uncompromising commitment to the equal value and equal claims of all rational beings and a recognition that, in the moral consideration of conduct, one's own subjective concerns do not have overriding importance.

#### Alt doesn’t create a movement – entrenched

Comaroff, 2011 (September, John, Harold H. Swift Distinguished Professor of Anthropology at the University of Chicago, The ANNALS of the American Academy of Political and Social Science, “The End of Neoliberalism? “What Is Left of the Left,” p. 142-146)

While the world economic crisis of 2008–2009 might have killed off neoliber- alism as a global ideological project—patently, in the noun form—it is highly likely to leave the capillaries of the beast, less Leviathan than Great White Shark, largely intact. Indeed, the “meltdown” and its aftermath may see the planet less, not more, open to alternatives to the neoliberal tendency, albeit with significant “corrections” as some economists were already calling them more than a year back. I am reminded here, simultaneously, of Reinhart Koselleck and the Manchester School of Anthropology in Central Africa. Koselleck, in his study of the Enlightenment and the pathogenesis of modern society, drew attention to the dialectics of crisis, critique, and correction; for its part, the Manchester School demonstrated the capacity of cycles of rupture and their repair to reproduce social systems and the order of values on which they are predicated (see, for example, Gluckman 2004; Turner 1996). Crisis, self-evidently, is always reproductive. But it frequently is. As Mike Davis (1995) once noted, “apocalypse” is often absorbed quickly into the history of the everyday, a process he describes as the “dialectic of ordinary disaster.” As talk has grown of “green shoots” sprouting in the wake of the economic devastation of the past two years or so, there have been signs of both crisis-driven critique in pursuit of “correction” and a return to the “ordinary.” Discourses of correction have come from both liberal and conservative sources. In a special edition of Harper’s in 2008, James Galbraith, Joseph Stiglitz, and others—most of them with impeccable liberal credentials—suggested a range of strategies to ensure that capitalism might reemerge relatively unscathed. They prescribed cures such as reforming the tax system, banning stock options as incentives, bringing into line the self-interest of the banking sector with those of the economy and society at large, and finding regulatory means to harness both the risk-laden excesses of the finance industry and the tendency to favor short-run profiteering over longer- term wealth production. Only one contributor to the debate, Eric Janszen— ironically, a venture capitalist—took a more radical line. He argued for a return to industrial capitalism, pointing out that all recent bubbles and busts are owed to government creating conditions for mammoth, “metastasiz[ing]” markets in financial speculation. Janszen apart, these efforts to “save capitalism” were symptomatic of a rush of similar liberal writings on the topic. Few of them—the notable exception being Gillian Tett’s extraordinary Fool’s Gold (2009)—delved deeply into the archaeol- ogy of the crisis itself or, more generally, into the inner workings of a global political economy whose complexity has increased exponentially over the past couple of decades. As a result, most have sought solutions along its outer surfaces. They have posited adjustments that might limit the material excesses of the neo- liberal tendency and, in particular, the market instabilities and conflicts of interest to which those excesses give rise. This, itself, is a function of the pervasive prac- tice of explaining all economic processes these days by recourse to one or another kind of utilitarian theory, which is why the four causes of the apocalypse, as John Lanchester (2009) has pointed out, are almost invariably taken to be “greed, stu- pidity, government, and the banks,” not anything in the structure of contemporary capitalism itself. The pursuit of explanations and panaceas in such terms, as we might expect, has its parallel on the Right, most notably perhaps in Richard Posner’s A Failure of Capitalism (2009), a salvo from the Halls of Friedmania. Note that Posner did not title the book “the failure”—using a definite article—but merely “a failure.” Posner, predictably and—in light of Tett’s account—spuriously, argues that individuals in the finance industry acted rationally in the years before the crisis. That crisis, in his view a fully fledged “depression,” is blamed, again predictably, on bad government and ill-considered, perfectible forms of deregu- lation. His “corrections,” though, belong to the same genus as those proffered by liberal economists: establish new forms of regulation that reduce the conflict between the rational self-interest of economic actors and the commonweal—the invisible old hand here, of course, being the economist of invisible hands, Adam Smith. In the final analysis, from this vantage, the point is to perfect free market economies by establishing the regulatory environment most conducive to a suc- cessfully deregulated world. In the meantime—and this is where the “dialectic of the ordinary” becomes salient—for all the talk of the urgent need for “correction,” we have seen a tangible return to business as usual, even bad-faith business. This is in spite of the fact that deeper crises appear inevitable, that employment statistics are worsening, that rates of poverty and inequality are rapidly rising, and so on. The buzzword in the City of London, in late June 2009, was “BAB”: “bonuses are back.” And, with them, the forms of finance capital from which they emanate. As Jonathan Freedland (2009), also commenting on Britain, wrote, “Nine months ago”—in 2008—“the financial crisis seemed certain to bring a revolution in our economy. . . . Change had to be on the way.” But now “look what has happened. . . . [Just] when the world seemed ready to bury the neoliberal regime . . . we have returned to [its ways and means].” In sum, despite the stream of assertions during 2010 that the crisis would have deep transformative effects, putting an end to the “neoliberal regime,” most indicators suggest otherwise. For one thing, the massive infusions of money into the banking industry and mega-business on the part of national governments have occurred without the regulatory initiatives that were promised to follow. Yet again, public funds are being diverted into the private sector, underscoring the fact that capital continues to take its profits but not shoulder its losses, a curious, perverse denouement to the rise of Ulrich Beck’s Risk Society (1992). To be sure, state intervention in the U.S. economy after 2008 has never pointed in the direction of a “New New Deal,” as some Panglossian commentators on the Left thought it might. Just the reverse. It has been intended to save the corporate world, not secure civil society or ordinary citizens from the predations of the market; the pledge of measures that might protect those citizens immiserated by the crash, measures never substantial to begin with, has gone largely unrealized. We are plainly not witnessing a return to social democracy, let alone the genesis of a new age of nationalization; note, in this respect, how many of the nation-states of the global North are moving (further) to the right. Which may be why there have been so few legislative enactments anywhere promulgated to curb the practices that sparked the meltdown in the first place: per contra, while market forces have made it harder to negotiate toxic assets and to take some of the more extravagant gambles in the business of finance, the investment industry is widely reported not merely to have returned to its old ways, but to be inventing new “products” without palpable constraint. The derivatives trade, it seems, is rising again. So, too, are the ramparts around “economic liberalism.” A recent article in The Economist (2009) argues that, notwithstanding “the biggest economic calamity in 80 years . . . the free-market paradigm . . . deserves a robust defence.” These are not the only signs that the capillaries of the neoliberal tendency and the “free-market paradigm” continue to embrace us. There are many others. Some are obvious, like the continuing dominance of the corporate sector: its relative immunity from most legal challenge, even when its enterprises violate the being, bodies, belongings, or bioenvironment of ordinary citizens; its enjoyment of favor- able taxation regimes and, increasingly, the use of laws of eminent domain to expand its horizons; the protection of its physical, financial, and intellectual prop- erty, sometimes by recourse to police violence, as an ostensible function of the collective good; its capacity to influence the disposition of the public treasury and public policy and, reciprocally, to have insurgent action directed against it pros- ecuted as common crime—for example, in mass protests against the privatization of such “natural” assets as water and land. Other signs are less obvious, like the growing hegemony of legal orders, founded on constitutions of distinctly neolib- eral design, that favor individual rights over collective well-being; that limit the responsibility of government to protect or provision its citizens; that tend to criminalize race, poverty, and counterpolitics, in part by outlawing the salience of social cause or consequence; that subject what were once everyday democratic processes to the finality of judicial action, thereby juridifying politics to the exclu- sion of other forms of social action; that displace the “hot” sovereignty of the people into the “cold” sovereignty of the law; and that treat all citizens as rational, self-interested, rights-bearing actors and the world as a community of contract. (For more on neoliberal constitutionalism, see, for example, Schneiderman [2000] and Comaroff and Comaroff [2006].) I could go on in this vein. To do so, however, would be to risk stating the obvi- ous. But allow me one observation. Perhaps the most significant capillaries of the neoliberal that remain with us have to do with the state and governance. Foucauldians would prefer “governmentality” here; they have a point. Broadly speaking, neoliberal etatism seems to be surviving well, even strengthening, in most places. As Foucault explained in The Birth of Biopolitics (2008), the rise of neoliberalism—his use of the noun—marked a radical transformation: whereas before, the state, among its various bureaucratic operations, “monitored” the work- ings of the economy, its “organizing principle” is now the market. Government actually has become business. And nation-states have become holding companies in and for themselves. In the upshot, the categorical distinction between politics and economics, that classical liberal fiction, is largely erased. Effective gover- nance, in turn, is measured with reference to asset management, to the attraction of enterprise, to the facilitation of the entrepreneurial activities of the citizen as homo economicus, and to the capacity to foster the accumulation—but not the redistribution—of wealth. Under these conditions, heads of state begin to resemble, and often actually are, CEOs who treat the population as a body of shareholders; vide the likes of Silvio Berlusconi, who explicitly speaks of Italy as a company, or Dmitri Medvedev, head of Gazprom, Russia’s mightiest business and a major instrument of the country’s foreign policy. There is a more profound point here. Once upon a time, antineoliberal theory posited an opposition between the state and the free market, arguing that the antidote to the latter lay in the active inter- vention of the former. But the opposition is false, just another piece of the detri- tus of the modern history of capital. As states become mega-corporations (Kremlin, Inc.; Britain, PLC; South Africa, Pty Ltd.; Dubai, Inc.)—all of them, incidentally, branded and legally incorporated—they become inextricably part of the workings of the market and, hence, no longer an “outside,” an antidote, or an antithesis from which to rethink or reconstruct “the neoliberal paradigm.” This, in part, is why government is increasingly reduced to an exercise in the technical management of capital, why ideologically founded politics appear dead, replaced by the politics of interest and entitlement and identity—three counterpoints of a single triangle. And this is why the capillaries of neoliberal governance seem so firmly entrenched in the cartography of our everyday lives, there to remain for the foreseeable future—to the degree that any future is foreseeable.

#### Democracy checks their K impact

**O’Kane 97 –** Prof Comparative Political Theory, U Keele (Rosemary, “Modernity, the Holocaust and politics,” Economy and Society 26:1, p 58-9, AG)

Modern bureaucracy is not 'intrinsically capable of genocidal action' (Bauman 1989: 106). Centralized state coercion has no natural move to terror. In the explanation of modern genocides it is chosen policies which play the greatest part, whether in effecting bureaucratic secrecy, organizing forced labour, implementing a system of terror, harnessing science and technology or introducing extermination policies, as means and as ends. As Nazi Germany and Stalin's USSR have shown, furthermore, those chosen policies of genocidal government turned away from and not towards modernity. The choosing of policies, however, is not independent of circumstances. An analysis of the history of each case plays an important part in explaining where and how genocidal governments come to power and analysis of political institutions and structures also helps towards an understanding of the factors which act as obstacles to modern genocide. But it is not just political factors which stand in the way of another Holocaust in modern society. Modern societies have not only pluralist democratic political systems but also economic pluralism where workers are free to change jobs and bargain wages and where independent firms, each with their own independent bureaucracies, exist in competition with state-controlled enterprises. In modern societies this economic pluralism both promotes and is served by the open scientific method. By ignoring competition and the capacity for people to move between organizations whether economic, political, scientific or social, Bauman overlooks crucial but also very 'ordinary and common' attributes of truly modern societies. It is these very ordinary and common attributes of modernity which **stand in the way of modern genocides.**

franca and world currency (Adorno 1964/1973 1973).

#### Incentives-based environmental action in the context of nuclear power is good---key to policy effectiveness

Economist 5 (The Economist, April 21, “Rescuing environmentalism”, <http://www.economist.com/node/3888006>

THE environmental movement's foundational concepts, its method for framing legislative proposals, and its very institutions are outmoded. Today environmentalism is just another special interest.” Those damning words come not from any industry lobby or right-wing think-tank. They are drawn from “The Death of Environmentalism”, an influential essay published recently by two greens with impeccable credentials. They claim that environmental groups are politically adrift and dreadfully out of touch. They are right. In America, greens have suffered a string of defeats on high-profile issues. They are losing the battle to prevent oil drilling in Alaska's wild lands, and have failed to spark the public's imagination over global warming. Even the stridently ungreen George Bush has failed to galvanise the environmental movement. The solution, argue many elders of the sect, is to step back from day-to-day politics and policies and “energise” ordinary punters with talk of global-warming calamities and a radical “vision of the future commensurate with the magnitude of the crisis”. Europe's green groups, while politically stronger, are also starting to lose their way intellectually. Consider, for example, their invocation of the woolly “precautionary principle” to demonise any complex technology (next-generation nuclear plants, say, or genetically modified crops) that they do not like the look of. A more sensible green analysis of nuclear power would weigh its (very high) economic costs and (fairly low) safety risks against the important benefit of generating electricity with no greenhouse-gas emissions. Small victories and bigger defeats The coming into force of the UN's Kyoto protocol on climate change might seem a victory for Europe's greens, but it actually masks a larger failure. The most promising aspect of the treaty—its innovative use of market-based instruments such as carbon-emissions trading—was resisted tooth and nail by Europe's greens. With courageous exceptions, American green groups also remain deeply suspicious of market forces. If environmental groups continue to reject pragmatic solutions and instead drift toward Utopian (or dystopian) visions of the future, they will lose the battle of ideas. And that would be a pity, for the world would benefit from having a thoughtful green movement. It would also be ironic, because far-reaching advances are already under way in the management of the world's natural resources—changes that add up to a different kind of green revolution. This could yet save the greens (as well as doing the planet a world of good). “Mandate, regulate, litigate.” That has been the green mantra. And it explains the world's top-down, command-and-control approach to environmental policymaking. Slowly, this is changing. Yesterday's failed hopes, today's heavy costs and tomorrow's demanding ambitions have been driving public policy quietly towards market-based approaches. One example lies in the assignment of property rights over “commons”, such as fisheries, that are abused because they belong at once to everyone and no one. Where tradable fishing quotas have been issued, the result has been a drop in over-fishing. Emissions trading is also taking off. America led the way with its sulphur-dioxide trading scheme, and today the EU is pioneering carbon-dioxide trading with the (albeit still controversial) goal of slowing down climate change. These, however, are obvious targets. What is really intriguing are efforts to value previously ignored “ecological services”, both basic ones such as water filtration and flood prevention, and luxuries such as preserving wildlife. At the same time, advances in environmental science are making those valuation studies more accurate. Market mechanisms can then be employed to achieve these goals at the lowest cost. Today, countries from Panama to Papua New Guinea are investigating ways to price nature in this way (see article). Rachel Carson meets Adam Smith If this new green revolution is to succeed, however, three things must happen. The most important is that prices must be set correctly. The best way to do this is through liquid markets, as in the case of emissions trading. Here, politics merely sets the goal. How that goal is achieved is up to the traders. A proper price, however, requires proper information. So the second goal must be to provide it. The tendency to regard the environment as a “free good” must be tempered with an understanding of what it does for humanity and how. Thanks to the recent Millennium Ecosystem Assessment and the World Bank's annual “Little Green Data Book” (released this week), that is happening. More work is needed, but thanks to technologies such as satellite observation, computing and the internet, green accounting is getting cheaper and easier. Which leads naturally to the third goal, the embrace of cost-benefit analysis. At this, greens roll their eyes, complaining that it reduces nature to dollars and cents. In one sense, they are right. Some things in nature are irreplaceable—literally priceless. Even so, it is essential to consider trade-offs when analysing almost all green problems. The marginal cost of removing the last 5% of a given pollutant is often far higher than removing the first 5% or even 50%: for public policy to ignore such facts would be inexcusable. If governments invest seriously in green data acquisition and co-ordination, they will no longer be flying blind. And by advocating data-based, analytically rigorous policies rather than pious appeals to “save the planet”, the green movement could overcome the scepticism of the ordinary voter. It might even move from the fringes of politics to the middle ground where most voters reside. Whether the big environmental groups join or not, the next green revolution is already under way. Rachel Carson, the crusading journalist who inspired greens in the 1950s and 60s, is joining hands with Adam Smith, the hero of free-marketeers. The world may yet leapfrog from the dark ages of clumsy, costly, command-and-control regulations to an enlightened age of **informed, innovative, incentive-based greenery**.

#### Capitalism better for the environment

Bhagwati 4– Economics Professor, Columbia (Jagdish, In Defense of Globalization, p 144-5, AG)

The belief that specific pollutants, such as sulfur dioxide, resulting from increased economic activity will rise in urban areas as per capita income increases depends on two assumptions: that all activities expand uniformly and that pollution per unit output in an activity will not diminish. But neither assumption is realistic. As income rises, activities that cause more pollution may contract and those that cause less pollution may expand, so the sulfur dioxide concentration may fall instead of rise. In fact, as development occurs, economies typically shift from primary production, which is often pollution intensive, to manufactures, which are often less so, and then to traded services, which are currently even less pollution-intensive. This natural evolution itself could then reduce the pollution-intensity of income as development proceeds. Then again, the available technology used, and technology newly invented, may become more environment-friendly over time. Both phenomena constitute an ongoing, observed process. The shift to environment-friendly technology can occur naturally as households, for example, become less poor and shift away from indoor cooking with smoke-causing coal-based fires to stoves using fuels that cause little smoke. 19 But this shift is often a result also of environment-friendly technological innovation prompted by regulation. Thus, restrictions on allowable fuel efficiency have promoted research by the car firms to produce engines that yield more miles per gallon. But these regulations are created by increased environmental consciousness, for which the environmental groups can take credit. And the rise of these environmental groups is, in turn, associated with increased incomes. Also, revelations about the astonishing environmental degradation in the Soviet Union and its satellites underline how the absence of democratic feedback and controls is a surefire recipe for environmental neglect. The fact that economic growth generally promotes democracy, as discussed in Chapter 8, is yet another way in which rising income creates a better environment. In all these ways, then, increasing incomes can reduce rather than increase pollution. In fact, for several pollutants, empirical studies have found a bell-shaped curve: pollution levels first rise with income but then fall with it. 20 The economists Gene Grossman and Alan Krueger, who estimated the levels of different pollutants such as sulfur dioxide in several cities worldwide, were among the first to show this, estimating that for sulfur dioxide levels, the peak occurred in their sample at per capita incomes of $5,000–6,000. 21 Several historical examples can also be adduced: the reduction in smog today compared to what the industrial revolution produced in European cities in the nineteenth century, and the reduced deforestation of United States compared to a century ago.

### Oil DA 2AC

#### No link – OPEC outweighs

LEVI ’12 - David M. Rubenstein senior fellow for energy and the environment at the Council on Foreign Relations and director of its Program on Energy Security and Climate Change (Levi, Michael. “Think Again: The American Energy Boom”. August, 2012. http://www.foreignpolicy.com/articles/2012/06/18/think\_again\_the\_american\_energy\_boom)

"We Can Drill Our Way Out of High Prices."

Don't bet on it. Some people claim that unleashing U.S. oil and gas resources would slash the price of crude. Who can forget the cries of "Drill, Baby, Drill!" that saturated airwaves during the 2008 presidential campaign? Others insist that, because oil is priced on a global market, increased U.S. output wouldn't move the needle. Even Douglas Holtz-Eakin, the top economist for John McCain's 2008 presidential campaign, has written, "Domestic action to increase production will not lower gas prices set on a global market." The precise truth lies somewhere in between. If U.S. producers were able to massively ramp up output, the ultimate impact would mostly boil down to one big question: How would other big oil producers (mainly the Saudis and the rest of OPEC) respond to a surge in U.S. supplies? To stop prices from falling, they could cut back their output in response to new U.S. production, much as they've tried to in the past. That's essentially what happens in the much-cited projections by the Energy Information Administration. In one recent exercise, for example, it looked at what would happen to gasoline prices if U.S. oil production grew by about a million barrels a day. The net impact was a mere 4 cents a gallon fall. Why? All but a sliver of the increase in U.S. output was matched by cutbacks in the Middle East, leaving oil prices barely changed.

#### Prices are headed for a crash to 2008 levels – tech and developing market slowdown

Dian L. Chu, 1-1-2013; Market Intelligence Specialist at Confidential, writer for EconMatters, “Where Nuclear Failed, Oil Succeeded” http://etfdailynews.com/2013/01/01/the-new-era-of-oil-renaissance-xle-uco-uso-sco-cvx-cop-mro/

$45 Oil & $2 Gasoline: Consumers Love this New Era In conclusion, we are entering a new Renaissance in the oil market, not just in the US, but globally as well. New technology, slower growth in the emerging markets over the next decade, and an era where a decade of high prices will finally bear some fruit with market dynamics working as their supposed to leading to more supply, and an eventual reduction in prices. Expect this new era to manifest itself in giving the entire world a tax break, and small businesses and consumers worldwide will have more disposable income, and sectors such as retail, entertainment, transportation, and global travel will benefit as a result of this sea change in the oil industry. I could even envision the manufacturing industry in the US getting a large piggyback effect as the US will have some of the cheapest energy costs of anywhere in the world for starting a business with an abundance of natural gas, oil and petroleum products for the next decade at a low and stable price. How does $45 a barrel oil and $2 a gallon gas sound? Something the peak oil folks thought was an outright impossibility just 5 years ago. But a lot of things can change real fast, once technology gets involved, impossible things become possible. Just look at smartphones versus 4 years ago, and the fact that I can deposit a check into my checking account via my smartphone, actually surf the net, get usable navigation directions, and watch Netflix movies on my smartphone. The world history of scientific innovation being applied to markets is remarkable to say the least looking back, it’s now time for the oil market to have its second renaissance. Expect $45 oil in the future of this renaissance.

#### Nuclear power wouldn’t replace oil – electricity and transportation are compartmentalized sectors

Matthew L. Wald 5-9-2005; When It Comes to Replacing Oil Imports, Nuclear Is No Easy Option, Experts Say http://www.nytimes.com/2005/05/09/politics/09energy.html?\_r=1&pagewanted=all

There is a problem, though: reactors make electricity, not oil. And oil does not make much electricity. Nuclear reactors produce about 20 percent of the electricity used in the United States and about 8 percent of the total energy consumed. Oil accounts for 41 percent of energy consumption. Could a few dozen more reactors, in addition to the 103 running now, cut into oil's share of the energy market? "Indirectly, but very indirectly," said Lawrence J. Goldstein, president of the Petroleum Industry Research Foundation, a nonprofit group that studies the economics of oil. People who think nuclear power is a way to reduce oil imports are "confusing several issues," he said. Peter A. Bradford, a former member of the Nuclear Regulatory Commission, added, "No one knowledgeable about energy policy would link nuclear power and gasoline prices." In the puzzle of energy consumption and production, however, experts point to three intersections of oil and nuclear power that would offer opportunities to cut demand for oil, pushing down its price and strategic significance. But all are limited, clumsy, expensive or dependent on new technologies whose success is not guaranteed, the experts say.

#### Hydrogen economy impossible

Savinar, 08 (Matthew David, Life After the Oil Crash, <http://www.lifeaftertheoilcrash.net/secondpage.html>)

A single hydrogen fuel cell requires approximately 20-50 grams of platinum. [Source](http://lifeaftertheoilcrash.net/Platinum.html) Let's say we want to replace 1/4 of the world's petroleum powered cars with hydrogen fuel cell powered cars. Twenty-to-fifty grams of platinum per fuel cell x 210 million fuel cells equals between 4.2 billion and 10.5 billion grams of platinum required for the conversion. Unfortunately, world platinum production is currently [at only about 240 million grams per year](http://www.mineweb.net/sections/platinum/501918.htm), most of which is already earmarked for thousands of [indispensable industrial processes](http://www.gold-eagle.com/editorials_02/paulos031902.html). If the hydrogen economy was anything other than a total red herring[,](http://www.fromthewilderness.com/free/ww3/081803_hydrogen_answers.html) such issues would eventually arise as 80 percent of the world’s proven platinum reserves are located in that bastion of geopolitical stability, South Africa

#### Low prices are key to Russian budget resilience and growth – that revitalizes the global economy

RT 6-22-2012; citing Jim O’Neill, Chairman for Goldman Sachs Asset Management, Russia Today, Lower oil price 'good for Russia' http://rt.com/business/news/oil-price-russia-economy-497/

Russia will benefit from lower oil prices says Jim O’Neill, Chairman for Goldman Sachs Asset Management. This follows news that Russia is to adopt new policies to make its economy less dependent on the price of crude. ­ "I think it will be good for Russia if oil prices go down”, Jim O’Neill told RT at the St. Petersburg International Economic Forum. Russia’s economy has long been heavily dependent on oil exports. Half of the budget revenues come from oil and gas. ”Russia certainly needs to be not so dependent on the drug of rising oil prices. It has to adopt and change to a quarter balance." And Russia seems to be heading in the right direction. President Vladimir Putin told the St. Petersburg Forum it was not enough to rely on an oil price of 115 dollars per barrel to achieve a deficit-free budget. “We need to diversify our economy away from total reliance on oil revenues, and turn to private capital as a source of growth,” he said. “Russia not only needs a deficit-free budget but a budget with a reserve of resilience.” Putin also said that “budget rules will be adopted soon under which "neither state liabilities, nor budgetary expenditure, nor long-term investment programs will depend on oil prices, and excess profits will go to replenish funds.” Analysts say Russia, one of the four BRIC countries, has become a particular surprise this year, Russia seems to be more sheltered from the current global economic crisis than it was during the 2008 and 2009 downturn. Its prospects are brighter than those of many other economies The country’s economy is expected to grow between 4-5 percent this year -much higher than any developed country. “If it carries on growing at these rates it will contribute more to the world this decade than he whole of Europe,” said Jim O’Neill. Together with the other BRIC nations Russia is ready to tackle the global economic crisis. “Emerging countries, including BRICS should play a bigger role in the world economy,” Russian President Vladimir Putin told the Petersburg International Economic Forum. Brazil, Russia, India, China and South Africa have recently offered their help, pledging to inject $75 billion into the IMF. China has offered $43 billion, while Brazil, Russia, India and Mexico promised $10 billion each. Meanwhile South Africa, Turkey, Colombia, Malaysia, New Zealand and the Philippines also promised smaller sums. The five BRICS nations represent 43 percent of the world’s population and about 18 percent of global economic output. They have about $4 trillion in combined reserves, with the lion’s share held by export powerhouse China. “If I had to rank them then China would be number one, Brazil -two, Russia number three and India four” Jim O’Neill of Goldman Sachs said. “Russia has lots of challenges, so does everybody else.”

#### Russian econ is resilient – budget flexibility, reserve funds, and falling ruble check total collapse

Jason Bush 7-2-2012; Reuters columnist, Oil-price slide highlights risks to Putin's Russia http://articles.economictimes.indiatimes.com/2012-07-02/news/32508636\_1\_oil-price-largest-oil-producer-peter-westin

Analysts say the impact on Russia of lower oil prices may be milder than during previous falls. "In the short term, in the next one to three years, we are fine," said Tchakarov. He noted that according to Finance Ministry calculations, every one dollar fall in the oil price means that the government loses around 55 billion roubles ($1.7 billion) in oil-related taxes over the course of a year. With the budget presently balancing at around $115 per barrel, an oil price of $90 per barrel, if sustained over a full year, would leave the government short to the tune of around $40 billion a year. But that is still just a fraction of the $185 billion that Russia has stashed away in two fiscal reserve funds, designed to stabilise the budget in just such an emergency. Even at $60 per barrel - the average oil price during the crisis year of 2009 - the reserve funds could cover the shortfall for about two years. "I find this worrying about the budget at this moment a little beside the point," said Clemens Grafe, chief Russia economist at Goldman Sachs. "The fiscal buffers they have to absorb this are going to be sufficient without cutting expenditure." Analysts also point out that since the previous financial crisis in 2008-2009, the central bank has radically changed the exchange rate regime, allowing the rouble to fall in line with the cheaper oil price. Since oil began its latest slide in mid-March, the rouble has lost around 15 percent of its value against the dollar. "The rouble weakened exactly in line with the oil price. And a weaker rouble is very good because it will secure the rouble equivalent of oil taxes for the budget," said Evgeny Gavrilenkov, chief economist at Troika Dialog.

#### Corruption inevitably crushes growth – and no short-term reforms will pass or be effectively implemented

Alexei Devyatov 6-15-2011; Chief Economist at URALSIB Capital, “ Russia Economy 2H11 Outlook: Reduced Impact of Oil on Russian Economic Growth” <http://www.bne.eu/story2735/Reduced_Impact_of_Oil_on_Russian_Economic_Growth>

We expect the Russian economy to grow about 4% on average in 2011-13 and starting from 2014, at 2-4%. Russia is an extremely interesting case. On the one hand, it has huge human capital and abundant natural resources. On the other hand, there is a lack of opportunities for transforming that potential into strong economic growth and prosperity. The main obstacles are an uncompetitive economy, an addiction to oil; poor demographics; weak institutions; and as a consequence, a poor investment climate. Administrative barriers make it more difficult for entrepreneurs to enter the market, which reduces competition and results in higher prices. The businesses suffer from pervasive corruption, which has effectively turned into unofficial tax burden in Russia. To attain rapid economic growth and prosperity, Russia needs to drastically improve its institutions, which means removing an entire class of corrupt officials. Unfortunately, over the last ten years, little has changed in terms of the quality of institutions, not least because those interested in maintaining the status quo have sufficient power to effectively block the reforms. Still we see the potential for gradual institutional changes as the government intensifies its efforts to fight corruption, to improve investment climate, and to modernize the economy

#### High oil prices cause ruble appreciation

Alexei Devyatov 6-15-2011; Chief Economist at URALSIB Capital, “ Russia Economy 2H11 Outlook: Reduced Impact of Oil on Russian Economic Growth” <http://www.bne.eu/story2735/Reduced_Impact_of_Oil_on_Russian_Economic_Growth>

Industrial production to slow down due to the strong ruble Even though expensive oil’s impact on the real economy seems to have been reduced, high oil prices have led to massive currency inflows, resulting in real ruble appreciation. In turn, the strong ruble has led to a surge in imports, which have substituted domestic goods. After the sharp devaluation of the ruble in early 2009, the Russian manufacturing industry benefitted from import substitution due to a contraction of 34.3% in imports in 2009. In 2010, imports bounced back by 29.7% and have continued to rapidly grow in 2011, which has eroded the import substitution effect and slowed down industrial output growth. The growth of capacity utilization, which has almost reached pre-crisis levels in 1Q11, is another source of industrial deceleration. Operating at almost full capacity requires new capital investment in order to boost production. Installation of new capital is an expensive and time consuming process, which is not allowing industrial production to grow as fast as it expanded in 2010 through increased utilization of existing spare capacity. These factors are responsible for the trend of decelerating industrial output, which emerged in February; after several months of stable industrial growth at 6-7%, in February growth slowed to 5.8% YoY, followed by YoY growth of 5.3% in March and 4.5% in April. We expect that trend to continue, leading to industrial output expanding 4.9% in 2011. In February, the real ruble-dollar exchange rate reached its pre-crisis high of July 2008 and surpassed it later on. A strong ruble makes imported goods affordable, which in turn boosts imports. Except for the seasonal troughs at the start of each year, statistical data shows a very close correlation between the real exchange rate and the volume of imports. We expect that with oil prices above $100/bbl (which we believe will prevail for most of the year), the ruble should appreciate to the dollar by 13% in real terms. Ruble appreciation will lead to 34.2% growth in imports to $334 bln in 2011 – most of this increase will come from import volumes rather than prices.

#### That crushes the Russian economy

Nienke Oomes and Katerina Kalcheva, July 2007. Bank of Finland – Institute for Economies in Transition. “Diagnosing Dutch disease: Does Russia have the symptoms?” <http://www.bof.fi/NR/rdonlyres/F9A915B5-39DE-45BB-92F2-B4C0ADFFE684/0/dp0707.pdf>

Oil and gas exports have contributed significantly to recent output growth in Russia. Crude oil, oil products, and gas together account for almost 60 percent of Russia’s total export revenues,4 and for an estimated 20–25 percent of Russia’s Gross Domestic Product (GDP).5 In recent years, record high oil prices have generated significant windfall revenues, have put the real exchange rate on an appreciation path, and have stimulated the economy to the point of overheating (Oomes and Dynnikova, 2006). However, in spite of record high oil prices, crude oil output and export growth have recently slowed significantly (Figure 1). In 2005 and 2006, oil output grew by only about 2½ percent year-on-year, following much higher growth rates of around 10 percent in both 2003 and 2004. There are several reasons for the slowdown. First, the recent increase in state ownership created significant uncertainty in the sector. Second, increases in oil sector taxation and bottlenecks in the distribution network have raised production and transportation costs. Third, there appear to be diminishing returns to existing oil extraction, implying that further growth is possible only with significant new investment in the exploration and development of new fields and the necessary export infrastructure. In addition to the constraints on fuel sector growth, the experience of other resource- rich countries suggests that natural resource wealth may lead to lower growth in thenon-resource sector as well. The notion that there may be such a “natural resource curse” is based on the empirical finding that resource-rich economies, on average, experience lower growth rates than resource-poor economies (Sachs and Warner, 1995, 2001). One explanation for this is that the large windfall revenues from natural resources tend to give rise to rent-seeking behavior and fights over the distribution of these revenues, which in turn impede growth, as productive resources are drawn into non-productive activities. A second explanation is that resource rents tend to be volatile, which is bad for growth. A third explanation— the one we will focus on in this paper—is that of “Dutch Disease,” the hypothesis that windfall revenues from natural resources give rise to real exchange rate appreciation, which in turn reduces the competitiveness of the manufacturing sector.6

#### No impact to Russian economy

Blackwill, 09 – former associate dean of the Kennedy School of Government and Deputy Assistant to the President and Deputy National Security Advisor for Strategic Planning (Robert, RAND, “The Geopolitical Consequences of the World Economic Recession—A Caution”, http://www.rand.org/pubs/occasional\_papers/2009/RAND\_OP275.pdf, WEA)

Now on to Russia. Again, five years from today. Did the global recession and Russia’s present serious economic problems substantially modify Russian foreign policy? No. (President Obama is beginning his early July visit to Moscow as this paper goes to press; nothing fundamental will result from that visit). Did it produce a serious weakening of Vladimir Putin’s power and authority in Russia? No, as recent polls in Russia make clear. Did it reduce Russian worries and capacities to oppose NATO enlargement and defense measures eastward? No. Did it affect Russia’s willingness to accept much tougher sanctions against Iran? No. Russian Foreign Minister Lavrov has said there is no evidence that Iran intends to make a nuclear weapon.25 In sum, Russian foreign policy is today on a steady, consistent path that can be characterized as follows: to resurrect Russia’s standing as a great power; to reestablish Russian primary influence over the space of the former Soviet Union; to resist Western eff orts to encroach on the space of the former Soviet Union; to revive Russia’s military might and power projection; to extend the reach of Russian diplomacy in Europe, Asia, and beyond; and to oppose American global primacy. For Moscow, these foreign policy first principles are here to stay, as they have existed in Russia for centuries. 26 None of these enduring objectives of Russian foreign policy are likely to be changed in any serious way by the economic crisis.

## 1ar

### Safety

#### IFR’s are safe and meltdown-proof [sodium coolant, passive shut-down]

Archambeauet all 11 [The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs, Charles Archambeau, Science Council for Global Initiatives, Randolph Ware, Cooperative Institute for Research in Environmental Sciences, Tom Blees, National Center for Atmospheric Research, Barry Brook, University of Adelaide, Jerry Peterson, Argonne National Laboratory,¶ Yoon Chang, University of Colorado, February 2011]

The IFR fast reactor uses metal fuel rather than one of the oxide fuels which are used in¶ LWR and other Generation II and III reactors. The metal fuel expands when heated, so in¶ the event of accidental reactor core over-heating, the density of the metal fuel will rapidly¶ decrease and cause a rapid drop in the number of neutron collisions with Uranium atoms¶ per unit volume of fuel. This drop will result in a termination of the nuclear chain reaction.¶ Hence reactor core overheating from any cause will result in a fuel density decrease¶ followed by a termination of the chain reaction and the automatic shut down of the reactor.¶ This whole reaction chain is called a passive shut-down because no operator action, or¶ automatic electronic sensor driven feed-back system, is needed. This passive safety feature¶ is an important and robust addition to fast reactor operational safety which is not found in¶ LWR and other open cycle reactors. Consequently, the resistance to core melt-down in¶ these IFR reactors is extremely high, with near vanishing probability of such an event¶ occurring in the life-time of the reactor. As well as metal fuel use, the IFR uses metal¶ coolant (sodium preferred) which allows safe operation at high output temperatures leading¶ to greater efficiency and lower reactor fabrication costs. The IFR metal coolant pool is also¶ a large heat sink which safely absorbs the excess heat in the reactor core after passive shutdown.

### South Korea

#### American support of pyroprocessing solves international integration of bad forms of technology

**Peters 12** [“Recycling Used Nuclear Fuel: Balancing Energy and Waste Management Policies”, Testimony to U.S. House of Representatives, Committee on Foreign Affairs, Subcommittee on Asia and the Pacific, Mark T. Peters, Deputy Laboratory Director for Programs at Argonne, National Laboratory, American Nuclear Society, June 6, 2012, khirn]

Pyroprocessing offers several potential benefits over current aqueous recycling techniques, such as the PUREX process being used in France and Japan today. These include the ability to recover minor actinides, which otherwise contribute significantly to the long-term radiotoxicity of used nuclear fuel; fewer releases of fission gases and tritium; and, the lack of production of pure plutonium, which helps to address proliferation concerns. Clearly, there will be engineering challenges inherent in the development of pyroprocessing technology, as there are with any other advanced manufacturing processes. However, these challenges can be addressed through joint research and development activities, and solving these challenges will have important implications for the United States as well as the Republic of Korea. The American Nuclear Society believes that nuclear fuel recycling has the potential to reclaim much of the residual energy in used fuel currently in storage as well as used fuel that will be produced in the future, and that recycling offers a proven alternative to direct disposal of used fuel in a geological repository. In other nations, recycling of nuclear fuel with proper safeguards and material controls, under the auspices of the International Atomic Energy Agency (IAEA), has demonstrated that high-level waste volumes can be reduced safely and securely while improving the sustainability of energy resources. It is the opinion of the ANS that **the United States should begin planning a thoughtful and orderly transition to nuclear fuel recycling** in parallel with the development of a geologic repository. Recycling would enhance the repository’s efficiency, eliminating the need for most complex and expensive engineered barriers and reducing the timeframe of concern from more than 100,000 years to a few hundred years. The ANS also believes that the United States should accelerate development of fast spectrum reactors, which are uniquely capable of generating energy while consuming long-lived waste. Six decades ago, on December 20, 1951, scientists and engineers from Argonne National Laboratory started a small electrical power generator attached to an experimental fast reactor, creating enough energy to power four 200-watt electrical bulbs. That historic achievement demonstrated the peaceful use of nuclear energy and launched today's global commercial nuclear energy industry. But it should not be overlooked that the first electricity generated through nuclear energy was produced using a fast reactor.3 In closing, let me reiterate that the ANS believes that nuclear energy has a significant role to play in meeting the global energy demands of the 21 st century, and that a global expansion of nuclear energy can be achieved safely and securely.

#### No anti-ENR enforcement now – makes reprocessing inevitable in the status quo – only plan solves

**Viski 12** [“It's Not as Easy as 1-2-3 : The Obama Team Fights over How to Promote Nuclear Energy Without Promoting Nuclear Weapons”, Foreign Policy, Andrea, foreign policy analyst, August 1, 2012]

So far, however, the administration has been reluctant to put the squeeze on potential partners. Many Obama officials took the view outlined by Poneman in his article -- that asking states to renounce ENR could make the situation worse. (It is important to note that I am not aware of Poneman's view inside the interagency deliberations.) So the administration has largely avoided pressuring states to renounce enrichment and reprocessing capabilities. Despite early talk of the "gold standard," this January the administration announced it would take what officials described as a case-by-case approach. In bureaucratic terms, this amounts to having no standard at all. It is hard to imagine a less restrictive policy. I suppose the administration could announce it would not even try. As it is, they will try -- but not very hard.

### Framework

#### Epistemological debate is irrelevant - concrete action is inevitable - they fail to create useful knowledge

**Friedrichs, 09** [Jorg, University Lecturer in Politics at the Oxford Department of International Development, “From Positivist Pretense to Pragmatic Practice Varieties of Pragmatic Methodology in IR Scholarship” Pragmatism and International Relations]

As Friedrich Nietzsche ([1887] 1994:1; cf. Wilson 2002) knew, the knower isstrangely unknown to himself. In fact, it is much morehazardous to contemplate theway how we gain knowledge than to gain such knowledge in the ﬁrst place. This is not to deny that intellectuals are a narcissistic Kratochwil lot, with a penchant for omphaloskepsis. The typical result of their navel-gazing, however, is not increased self-awareness. Scholars are more likely to come up with ex-post-facto rationalizations of how they would like to see their activity than with accurate descriptions of how they go about business. As a result, in science there is a paradoxical divide between positivist pretenseand pragmatic practice. Many prominent scholars proceed pragmatically in gen-erating their knowledge, only to vest it all in a positivist cloak when it comes topresenting results. In the wake of Karl Popper (1963), fantasies about ingeniousconjectures and inexorable refutations continue to hold sway despite the muchmore prosaic way most scholars grope around in the formulation of their theo-ries, and the much less rigorous way they assess the value of their hypotheses. In proposing pragmatism as a more realistic alternative to positivist idealiza-tions, I am not concerned with the original intentions of Charles Peirce. Theseare discussed and enhanced by Ryto¨ vuori-Apunen (this forum). Instead, Ipresent various attempts to make pragmatism work as a methodology for IR scholarship. This includes my own preferred methodology, the pragmaticresearch strategy of abduction. As Fritz Kratochwil and I argue elsewhere, abduction should be at the center of our efforts, while deduction and induction areimportant but auxiliary tools (Friedrichs and 2009).Of course, one does not need to be a pragmatist to proceed in a pragmatic way. Precisely because it is derived from practice, pragmatic commonsense is a sold as the hills. For example, James Rosenau (1988:164) declared many yearsago that he coveted ‘‘a long-held conviction that one advances knowledge most effectively by continuously moving back and forth between very abstract and very empirical levels of inquiry, allowing the insights of the former to exert pressurefor the latter even as the ﬁndings of the latter, in turn, exert pressure for the for-mer, thus sustaining an endless cycle in which theory and research feed on eachother.’’ This was shortly before Rosenau’s turn to postmodernism, while he wasstill touting the virtues of behaviorism and standard scientiﬁc requisites, such asindependent and dependent variables and theory testing. But if we take his state-ment at face value, it appears that Rosenau-the-positivist was guided by a sort of pragmatism for all but the name. While such practical commonsense is certainly valuable, in and by itself, it does not qualify as scientiﬁc methodology. Science requires a higher degree of methodological awareness. For this reason, I am not interested here in pragma-tism as unspoken commonsense, or as a pretext for doing empirical researchunencumbered by theoretical and methodological considerations. Nor am I con-cerned with pragmatism as an excuse for staging yet another epistemological debate. Instead, I am interested in pragmatism as an instrument to go about research with an appropriate degree of epistemological and methodologicalawareness. Taking this criterion as my yardstick, the following three varieties of pragmatist methodology in recent IR scholarship are worth mentioning: theory synthesis, analytic eclecticism (AE), and abduction.Theory synthesis is proposed by Andrew Moravcsik (2003), who claims that theories can be combined as long as they are compatible at some unspeciﬁedfundamental level, and that data will help to identify the right combination of theories. He does not explicitly invoke pragmatism but vests his pleading in apositivist cloak by using the language of theory testing. When looking closer,however, it becomes apparent that his theoretical and methodological noncha-lance is far more pragmatic than what his positivist rhetoric suggests. Moravcsiksees himself in good company, dropping the following names: Robert Keohane,Stephen Walt, Jack Snyder, Stephen Van Evera, Bary Buzan, Bruce Russett, John O’Neal, Martha Finnemore, and Kathryn Sikkink. With the partial excep-tion of Finnemore, however, none of these scholars explicitly links his or herscholarship to pragmatism. They employ pragmatic commonsense in theirresearch, but devoutly ignore pragmatism as a philosophical and methodologicalposition. As a result, it is fair to say that theory synthesis is only on a slightly higher level of intellectual awareness than Rosenau’s statement quoted above. Analytic eclecticism, as advertized by Peter Katzenstein and Rudra Sil, links acommonsensical approach to empirical research with a more explicit commit-ment to pragmatism (Sil and Katzenstein 2005; Katzenstein and Sil 2008).The 7 Even the dean of critical rationalism, Karl Popper, is ‘‘guilty’’ of lapses into pragmatism, for example when hestates that scientists, like hungry animals, classify objects according to needs and interests, although with the impor-tant difference that they are guided in their quest for ﬁnding regularities not so much by the stomach but ratherby empirical problems and epistemic interests (Popper 1963:61–62). 646 Pragmatism and International Relations idea is to combine existing research traditions in a pragmatic fashion and thusto enable the formulation and exploration of novel and more complex sets of problems. The constituent elements of different research traditions are trans-lated into mutually compatible vocabularies and then recombined in novel ways.This implies that most scholars must continue the laborious process of formulat-ing parochial research traditions so that a few cosmopolitan colleagues will beenabled to draw upon their work and construct syncretistic collages. 8 In additionto themselves, Katzenstein and Sil cite a number of like-minded scholars such asCharles Tilly, Sidney Tarrow, Paul Pierson, and Robert Jervis. 9 The ascription isprobably correct given the highly analytical and eclectic approach of these schol-ars. Nevertheless, apart from Katzenstein and Sil themselves none of these schol-ars has explicitly avowed himself to AE.My preferred research strategy is abduction, which is epistemologically asself-aware as AE but minimizes the dependence on existing research traditions.The typical situation for abduction is when we, both in everyday life and as socialscientists, become aware of a certain class of phenomena that interests us for somereason, but for which we lack applicable theories. We simply trust, although we donot know for certain, that the observed class of phenomena is not random. Wetherefore start collecting pertinent observations and, at the same time, applyingconcepts from existing ﬁelds of our knowledge. Instead of trying to impose anabstract theoretical template (deduction) or ‘‘simply’’ inferring propositions fromfacts (induction), we start reasoning at an intermediate level (abduction). Abduction follows the predicament that science is, or should be, above all amore conscious and systematic version of the way by which humans have learnedto solve problems and generate knowledge in their everyday lives. As it iscurrently practiced, science is often a poor emulator of what we are able toachieve in practice. This is unfortunate because human practice is the ultimatemiracle. In our own practice, most of us manage to deal with many challenging situations. The way we accomplish this is completely different from**,** and far moreefﬁcient than, the way knowledge is generated according to standard scientiﬁc methods. If it is true that in our own practice we proceed not so much by induction or deduction but rather by abduction, then science would do well tomimic this at least in some respects. 10 Abduction has been invoked by numerous scholars, including Alexander Wendt, John Ruggie, Jeffrey Checkel, Martin Shapiro, Alec Stone Sweet, andMartha Finnemore. While they all use the term abduction, none has ever thor-oughly speciﬁed its meaning. To make up for this omission, I have developedabduction into an explicit methodology and applied it in my own research oninternational police cooperation (Friedrichs 2008). Unfortunately, it is impossi-ble to go into further detail here. Readers interested in abduction as a way toadvance international research and methodology can also be referred to my recent article with Fritz Kratochwil (Friedrichs and Kratochwil 2009).On a ﬁnal note, we should be careful not to erect pragmatism as the ultimateepistemological fantasy to caress the vanity of Nietzschean knowers unknown tothemselves, namely that they are ingeniously ‘‘sorting out’’ problematic situa-tions. Scientiﬁc inquiry is not simply an intimate encounter between a researchproblem and a problem solver. It is a social activity taking place in communitiesof practice (Wenger 1998). Pragmatism must be neither reduced to the utility of results regardless of their social presuppositions and meaning, nor to the 8 Pace Rudra Sil (this forum), the whole point about eclecticism is that you rely on existing traditions to blendthem into something new. There is no eclecticism without something to be eclectic about. 9 One may further expand the list by including the international society approach of the English school (Ma-kinda 2000), as well as the early Kenneth Waltz (1959). 10 Precisely for this reason, abduction understood as ‘Inference to the Best Explanation’ plays a crucial role inthe ﬁeld of Artiﬁcial Intelligence. 647 The Forum fabrication of consensus among scientists. Pragmatism as the practice of dis-cursive communities and pragmatism as a device for the generation of useful knowledge are two sides of the same coin

#### The 1AC is a timeframe disad to the alternative—we’ve proven nuclear war is inevitable in the status quo—even if the alt solves, it doesn’t solve fast enough

#### Reinforcing the state is strategic—your alternative will either get violently crushed or cause private tyranny

**Chomsky 98** – Prof Linguistics, MIT (Noam, The Common Good, p 84-5, AG)

So Argentina is "minimizing the state"—cutting down public expenditures, the way our government is doing, but much more extremely. Of course, when you minimize the state, you maximize something else—and it isn't popular control. What gets maximized is private power, domestic and foreign. I met with a very lively anarchist movement in Buenos Aires, and with other anarchist groups as far away as northeast Brazil, where nobody even knew they existed. We had a lot of discussions about these matters. They recognize that they have to try to use the state—even though they regard it as totally illegitimate. The reason is perfectly obvious: When you eliminate the one institutional structure in which people can participate to some extent—namely the government—you're simply handing over power to unaccountable private tyrannies that are much worse. So you have to make use of the state, all the time recognizing that you ultimately want to eliminate it. Some of the rural workers in Brazil have an interesting slogan. They say their immediate task is "expanding the floor of the cage." They understand that they're trapped inside a cage, but realize that protecting it when it's under attack from even worse predators on the outside, and extending the limits of what the cage will allow, are both essential preliminaries to dismantling it. If they attack the cage directly when they're so vulnerable, they'll get murdered. That's something anyone ought to be able to understand who can keep two ideas in their head at once, but some people here in the US tend to be so rigid and doctrinaire that they don't understand the point. But unless the left here is willing to tolerate that level of complexity, we're not going to be of any use to people who are suffering and need our help—or, for that matter, to ourselves.

### Neoliberalism

#### Collectivism bad for enviro property rights key

Veer 12(Pierre-Guy, Independent journalist writing for the Von Mises Institute, 5/2, “Cheer for the Environment, Cheer for Capitalism,” http://www.mises.ca/posts/blog/cheer-for-the-environment-cheer-for-capitalism/)

No Ownership, No Responsibility How can such a negligence have happened? It’s simple: **no one was the legitimate owner of the resources** (water, air, ground). When a property is state-owned – as was the case under communism – **government has generally little incentive to sustainably exploit it**. In communist Europe, governments wanted to industrialize their country in order, they hoped, to catch up with capitalist economies. Objectives were set, and they had to be met no matter what. This included the use of brown coal, high in sulfur and that creates heavy smoke when burned[4], and questionable farming methods, which depleted the soil. This lack of vision can also be seen in the public sector of capitalist countries. In the US, the Department of Defense creates more dangerous waste than the top five chemical product companies put together. In fact, pollution is such that cleanup costs are estimated at $20 billion. The same goes for agriculture, where Washington encourages overfarming or even farming not adapted for the environment it’s in[5]. Capitalism, the Green Solution In order to solve most of the pollution problems, there exists a simple solution: **laissez-faire capitalism, i.e.** **make sure property rights and profitability can be applied**. The latter helped Eastern Europe; when communism fell, capitalism made the countries seek profitable – and not just cheap – ways to produce, which greatly reduced pollution[6]. As for the former, it proved its effectiveness, notably with the Love Canal[7]. Property rights are also thought of in order to protect some resources, be it fish[8] or endangered species[9]. Why such efficiency? Because an owner’s self-interest is directed towards the maximum profitability of his piece of land. By containing pollution – as Hooker Chemicals did with its canal – he keeps away from costly lawsuit for property violation. At the same time, badly managed pollution can diminish the value of the land, and therefore profits. Any entrepreneur with a long-term vision – and whose property is safe from arbitrary government decisions – thinks about all that in order to protect his investment. One isn’t foolish enough to sack one’s property! In conclusion, I have to mention that I agree with environmentalists that it is importance to preserve the environment in order to protect mother nature and humans. However, I strongly disagree with their means, i.e. government intervention. Considering it very seldom has a long-term vision, it is the worst thing that can happen. In fact, one could says that most environmental disasters are, directly or indirectly, caused by the State, mainly by a lack of clear property rights. Were they clearer, they would let each and everyone of us, out of self-interest, protect the environment in a better manner. That way, everyone’s a winner.

#### Desire for continued neoliberal growth is innate – poor countries won’t sign onto the alt

**Aligica ’03** (Paul Aligica, Fellow at the Mercatus Center at George Mason University and Adjunct Fellow at the Hudson Institute, “The Great Transition and the Social Limits to Growth: Herman Kahn on Social Change and Global Economic Development”, April 21, http://www.hudson.org/index.cfm?fuseaction=publication\_details&id=2827)

Stopping things would mean if not to engage in an experiment to change the human nature, at least in an equally difficult experiment in altering powerful cultural forces: "We firmly believe that despite the arguments put forward by people who would like to 'stop the earth and get off,' it is simply impractical to do so. Propensity to change may not be inherent in human nature, but it is **firmly embedded** in most contemporary cultures. People have almost everywhere become curious, future oriented, and dissatisfied with their conditions. They want more material goods and covet higher status and greater control of nature. Despite much propaganda to the contrary, they believe in progress and future" (Kahn, 1976, 164). As regarding the critics of growth that stressed the issue of the gap between rich and poor countries and the issue of redistribution, Kahn noted that what most people everywhere want was visible, rapid improvement in their economic status and living standards, and not a closing of the gap (Kahn, 1976, 165). The people from poor countries have as a **basic goal** the transition from poor to middle class. The other implications of social change are secondary for them. Thus a crucial factor to be taken into account is that while the zero-growth advocates and their followers may be satisfied to stop at the present point, most others are not. Any serious attempt to frustrate these expectations or desires of that majority is likely to **fail and/or create disastrous counter reactions.** Kahn was convinced that "any concerted attempt to stop or even slow 'progress' appreciably (that is, to be satisfied with the moment) **is catastrophe-prone**". At the minimum, "it would probably require the creation of extraordinarily repressive governments or movements-and probably a repressive international system" (Kahn, 1976, 165; 1979, 140-153). The pressures of overpopulation, national security challenges and poverty as well as the revolution of rising expectations could be **solved only in a continuing growth environment**. Kahn rejected the idea that continuous growth would generate political repression and absolute poverty. On the contrary, it is the limits-to-growth position "which creates low morale, destroys assurance, undermines the legitimacy of governments everywhere, erodes personal and group commitment to constructive activities and encourages obstructiveness to reasonable policies and hopes". Hence this position "increases enormously the costs of creating the resources needed for expansion, makes more likely misleading debate and misformulation of the issues, and make less likely constructive and creative lives". Ultimately "it is precisely this position the one that increases the potential for the kinds of disasters which most at its advocates are trying to avoid" (Kahn, 1976, 210; 1984).

# Round 4 – Aff v Iowa CK

## 2ac

### Solvency – AT: Licensing

#### The aff solves -- increasing nuclear construction drives down costs and prevents overruns.

**Spencer, ‘8**

[Jack, Research Fellow in Nuclear Studies -- The Heritage Foundation, 3-19, “Finland's Rational Approach to Nuclear Power,” http://www.heritage.org/Research/Energyandenvironment/bg2117.cfm]

Critics have questioned the economic viability of nuclear power based on delays associated with Fin­land's reactor.[8] At $1.4 billion over budget and two years behind schedule, Finland's reactor has had its problems.[9] However, these delays and cost overruns are not necessarily indicative of the future economic viability of nuclear power. Olkiluoto 3 is a first-of-a-kind, large, multibil­lion-dollar power station. Assigning all of the costs of the first plant to future plants would not be accuate. Construction costs will be reduced as lessons learned from initial construction projects are inte­grated into future ones. Some of the overruns are simply a reflection of rising labor and material costs. These increases, which are not unique to the nuclear industry, would affect any project. Building the 3,200 windmills that would be needed to produce the same amount of electric­ity as Olkiluoto 3 will produce would likely suffer from the same price volatility.[10] A lack of skilled personnel, shortages of nuclear-qualified components and materials, and inexperi­enced vendors and subcontractors have also slowed progress.[11] Very few reactors have been ordered over the past three decades, and the industrial base and skill sets are simply not yet available to support the growing demand for commercial nuclear power. Although these risks should have been expected for a project like Olkiluoto 3, they are also correctable and will be resolved by the market over time**.**¶ As backlogs are created by new orders, nuclear suppliers will invest to expand capacity. For exam­ple, Japan Steel Works has already announced that it will expand its capacity to produce the large forg­ings used to manufacture reactor components. It is the sole supplier of these forgings on the world mar­ket. Other companies have made similar announce­ments to provide expanded uranium enrichment, mining, manufacturing, and used-fuel services. This growth in capacity will eventually meet demand and moderate some of the inflationary pressures that are driving up costs for Finland's newest reactor.

#### NRC is rubber stamp for nuke licensing – will cave to industry pressure

Karl Grossman (full professor of journalism at the State University of New York College at Old Westbury. For more than 45 years he has pioneered the combination of investigative reporting and environmental journalism in a variety of media, writer for the Huffington Post) May 30, 2012 “USA’s Nuclear Regulatory Commission is into nuclear promotion rather than nuclear safety” http://nuclear-news.info/2012/06/04/usas-nuclear-regulatory-commission-is-into-nuclear-promotion-rather-than-nuclear-safety/

The resignation last week of the chairman of the U.S. Nuclear Regulatory Commission is another demonstration of the bankrupt basis of the NRC. Gregory Jaczko repeatedly called for the NRC to apply “lessons learned” from the Fukushima Daiichi nuclear plant disaster in Japan. And, for that, the nuclear industry — quite successfully — went after him fiercely. The New York Times, in an editorial over the weekend , said that President Obama’s choice to replace Jaczko, Allison Macfarlane, “will need to be as independent and aggressive as Dr. Jaczko.” That misses the institutional point. The NRC was created in 1974 when Congress abolished the U.S. Atomic Energy Commission after deciding that the AEC’s dual missions of promoting and at the same time regulating nuclear power were deemed a conflict of interest. The AEC was replaced by the NRC, which was to regulate nuclear power, and a Department of Energy was later formed to advocate for it. However, the same extreme pro-nuclear culture of the AEC continued on at the NRC. It has partnered with the DOE in promoting nuclear power. Indeed, neither the AEC, in its more than 25 years, nor the NRC, in its nearly 30 years, ever denied an application for a construction or operating license for a nuclear power plant anywhere, anytime in the United States. The NRC is a rubberstamp for the nuclear industry. “NRC stands for Nuclear Rubberstamp Commission,” says Kevin Kamps of the organization Beyond Nuclear. And it isn’t that Jaczko opposed nuclear power. “Greg is not anti-nuclear, but he’s pro-nuclear in a smart and considered way,” says Christopher Paine , director of the nuclear program at the Natural Resources Defense Council.

#### Durable fiat solves – the actor passing the plan can’t do something that functionally rolls it back – key to aff ground and overcome inherency humps – NRC is part of the USFG

Joseph P. Kennedy Foundation No Date “Key Independent Executive Branch Agencies” http://www.jpkf.org/jpkf-policy-guide/IndepExecBranch.html

The executive branch of the federal government includes its major operating units such as the Departments of Health and Human Services, Labor, and Education. However, many other agencies also have public responsibilities for government operations such as NASA, the CIA and the Social Security Administration. Executive branch independent agencies are part of the executive branch, but not part of a specific executive department. The heads of independent agencies are appointed by and serve at the pleasure of the President.

### Solvency – AT: Skilled Worker Shortage

#### The plan solves -- building new nuclear plants attracts labor.

Howard, ‘7

[Angie, Vice President -- Nuclear Energy Institute, 2-5, “Achieving Excellence in Human Performance: Nuclear Energy Training and Education”, <http://www.nei.org/newsandevents/speechesandtestimony/2007/americannuclearsocietyextended>]

Yes, we do have a looming workforce crisis. The average age of employees in the industry is 48 years—one of the oldest of any major industries in the country. Retirement and attrition will create the need to essentially re-staff the existing fleet over the next 10 years. We need to get the younger generation into the industry. But the industry is hiring, and we have employment opportunities that are attractive to talented young people, both in the craft and in the professional engineering and management fields. Research among college engineering students has shown that the prospect of building new plants is the single most important factor in attracting new talent to the nuclear energy industry. Social responsibility, creativity, learning opportunities, compensation—these are the other priorities when young people look for in a career today.

### Politics DA 2AC Generic

#### No clear immigration proposal yet – vote isn’t until June – this is your uniqueness article

**Foley and Stein 1-2** – Elise and Sam, writers for the Huffington Post (Obama's Immigration Reform Push To Begin This Month, Huffington Post, <http://www.huffingtonpost.com/2013/01/02/obama-immigration-reform_n_2398507.html?1357169103>)

* \*\*Note – this is after the good card that says Immigration is at the top of the agenda

It remains unclear what type of immigration policies the White House plans to push in January, but turning them into law could be a long process. Aides expect it will take about two months to write a bipartisan bill, then another few months before it goes up for a vote, possibly in June. A bipartisan group of senators are already working on a deal, although they are still in the early stages. Rep. Zoe Lofgren (D-Calif.) will likely lead on the Democratic side in the House. While many Republicans have expressed interest in piecemeal reform, it's still unclear which of them plan to join the push.

Lofgren expressed hope that immigration reform would be able to get past partisan gridlock, arguing that the election was seen as something of a mandate for fixing the immigration system and Republicans won't be able to forget their post-election promises to work on a bill. "In the end, immigration reform is going to depend very much on whether Speaker [John] Boehner wants to do it or not," Lofgren said.

#### The only article that even supports the push is ONE Huffington Post article cites an anonymous source – no major action coming anytime soon

 Josh Voorhees (writer for Slate Magazine) January 3, 2013 “White House (Quietly) Promises Immigration Push” http://www.slate.com/blogs/the\_slatest/2013/01/03/obama\_s\_immigration\_plans\_white\_house\_officials\_suggest\_early\_2013\_won\_t.html

With one fiscal-cliff fight in the rearview mirror and several more likely looming not too far up the road, many liberals are fretting aloud that President Obama won't have the energy or desire to tackle other issues near the top of his—and their—second-term wish list. White House officials, however, are doing their best to allay those concerns with the (somewhat quiet) promise of action on two high-profile issues: immigration and gun control. [\*\*\*quotes their article\*\*\*] The Huffington Post: An Obama administration official said the president plans to push for immigration reform this January. The official, who spoke about legislative plans only on condition of anonymity, said that coming standoffs over deficit reduction are unlikely to drain momentum from other priorities. The White House plans to push forward quickly, not just on immigration reform but gun control laws as well. [\*\*\*quotes their article\*\*\*] In the wake of last month's tragedy in Newtown, the president promised to send a gun-control proposal to Congress early this year, likely as soon as this month. The suggestion that the White House will also get to work on immigration reform—long a priority of the president but one that has largely taken a back seat during his time in office—comes as slightly more of a surprise. However, just because the administration is declaring that an unofficial launch to the immigration push is imminent doesn't mean anyone should expect major action anytime soon. The aides who laid out the plans to HuffPo cautioned that it would probably take about two months to cobble together a bipartisan bill, and then another few before either chamber votes on it. That would mean that if all goes as planned (something that is far from certain) it would likely be early or mid-summer before any concrete actions are taken.

#### The impact is an insurance industry hoax that ignores growth, technology and all other factors that check

**Scrivener, ‘2** (P. Essayist, “The myth of the demographic time bomb”, http://www.sovereignty.org.uk/features/articles/demog2.html)

Why the pessimists are wrong

The pessimists use an arbitrary retirement age. British society has tended to accept the government's pension age or retirement age as the dividing line between active adulthood and old age, but when pensions were first introduced in Britain the retirement age was 70.

The compression of work into fewer years of longer hours does not fit well with increasing longevity, and there have been a number of authoritative calls from parliament and the actuarial profession against early retirement.

They assume that the present retirement age equates to the age at which elderly people become a burden. Commentators have taken the ratio of over 64-year olds to the population of working age (usually taken as the 16 to 64 age range) as the key trend in the rise in the elderly 'dependency' ratio. But continued improvements in living conditions make contemporary and future generations of the elderly fitter and healthier. And as across Europe and America healthcare costs are concentrated in the last six months of life, projections should be built up by counting back from the forecast date of death rather than from the date of birth.

They ignore economic growth. It is assumed that an ageing population will bankrupt the state pension scheme. However, the future rate of economic growth and the level of wealth creation determine affordability.

It is the types of jobs and technology, as well as the number of working people, that determine society's productivity. Modern societies double their wealth about every 25 years. This pace of expansion projected into the next half-century dwarfs the extra cost for society from more elderly dependants. In any case, industrialised societies are already productive enough to produce sufficient wealth to provide for the present elderly population, and even quite low levels of growth will satisfy even the most extreme projections of the future pace of ageing. (Indeed, using immigration to increase the labour force will depress wages, discourage investment in capital, slow the increase in productivity and decrease competitiveness -- as happened in England with the cotton industry.)

Because of increased wealth, Western societies have been able to manage a fall in the ratio of working people to retired people from 12:1 in 1900 to around 3:1 today.

They also ignore the possibility of encouraging changes in fertility. More influential on demographic ageing than increased longevity or the reduction of premature death, has been the fall in fertility rates. With each generation smaller than its predecessor the average age of the population rises. The proportion, and not necessarily the numbers, of old people rises.

Further declines in old age mortality will be much slower than over the past few decades. Then, if fertility were in the region of the replacement rate, population numbers and the age structure of the population would tend to stabilise. So, if society fears that there may be a problem with an ageing population (though this has been shown not to be the case), action could be taken now to encourage an increase in the birth rate to replacement levels.

The main cause of the decline in the fertility rate appears to be the increase in the numbers of working women, and the continuing inadequacy of proper childcare facilities discouraging pregnancy. Women tend to marry later and get pregnant later.

There are a number of actions that could be taken: taking one wage into account when calculating mortgages thus allowing one partner to stay at home to look after children; encouraging a more positive attitude towards family creation as the source of personal happiness and security and the basis of a stable society; the workplace, the tax and welfare system, such as increasing child benefit, could be made more favourable to women, so that they are able to have more than one child each.

Finally, the mythmakers use projections instead of forecasts. The official projections for Britain are that ageing will accelerate in the first third of the 21st century. Although these projections are widely used to back up the case for a demographic time bomb, a member of the Government Actuary's Department has written "the one certainty of making population projections is that these projections will, to a greater or lesser extent, turn out to be wrong as a forecast of future demographic behaviours".

**A projection based on the present state of affairs cannot forecast the future**, because present trends may not be maintained. Changes to fertility rates could significantly alter the situation. Even if all the projections are accurate, there will be a peak around 2040 in the proportion and numbers of over64s. Mullen tells us that the familiar steadily ascending lines on the charts used by alarmist commentators do not extend much beyond 2040. After this time, the proportion of over-64s declines.

#### No aging crisis – current immigration rates and high fertility solve

**Howe and Jackson 9** - Researchers at the Center for Strategic and International Studies and co-authors of "The Graying of the Great Powers: Demography and Geopolitics in the 21st Century.", “ (Neil and Richard, The World Won't Be Aging Gracefully. Just the Opposite.”, Washington Post, Jan 4, <http://www.washingtonpost.com/wp-dyn/content/article/2009/01/02/AR2009010202231.html>)

An important but limited exception to hyperaging is the United States. Yes, America is also graying, but to a lesser extent. We are the only developed nation with replacement-rate fertility (2.1 children per couple). By 2030, our median age, now 36, will rise to only 39. Our working-age population, according to both U.N. and census projections, will continue to grow throughout the 21st century because of our higher fertility rate and substantial immigration -- which we assimilate better than most other developed countries. By 2015, for the first time ever, the majority of developed-world citizens will live in English-speaking countries.

#### PC Irrelevant – Obama wont use it correctly

Peter Baker (writer for the International Herald Tribune) January 3, 2013 “ Obama deal draws quick complaints from liberals; Compromise reignites debate over president's skills as a negotiator” Lexis

The criticism from the left mirrors past complaints when Mr. Obama included tax cuts in his stimulus package, gave up on a government-run option in health care negotiations and temporarily extended Bush-era tax cuts for the wealthy two years ago. Liberals said Mr. Obama should have capitalized on his re-election victory and the expiration on New Year's Day of all of the Bush tax cuts to force Republicans to accept his terms. ''The president remains clueless about how to use leverage in a negotiation,'' said Adam Green, a co-founder of the Progressive Change Campaign Committee, a liberal advocacy organization. ''Republicans publicly admitted they lost the tax debate and would be forced to cave, yet the president just kept giving stuff away.'' Robert B. Reich, the former labor secretary, said that Mr. Obama had ''stiffened his tactical resolve'' but that ''he's still the same President Obama who wants a deal above all else and seems willing to compromise on even the most basic principle.''

#### Gun control and fiscal cliff triggers the link

Nakamura, Dec 22 (David, “Advocates fear gun control agenda will divert Obama from immigration reform,” <http://articles.washingtonpost.com/2012-12-22/politics/36016645_1_immigration-reform-immigration-advocates-immigration-strategy>)

“There is clear momentum for it, so it’s really important to get to it immediately because it will not happen overnight,” said Eliseo Medina, the secretary-treasurer of the Service Employees International Union, which spent millions recruiting new Hispanic voters this year. “Our belief is that 2013 is the window of opportunity. We’d like to see it happen in the first part of year, whether it’s three months or six months, but in order to start the clock running we have to start quickly.” Medina and other advocates said the White House told them to be ready as early as next month to help lobby Congress and rally the public over reforms that could help provide a path to citizenship for the nation’s 11 million undocumented workers. Obama, who won 71 percent of the Latino vote, said during his first news conference after winning reelection that he expected to have a comprehensive legislative bill introduced in Congress “very soon after my inauguration” on Jan. 20. But that was before a gunman killed 26 people, including 20 children, at Sandy Hook Elementary School on Dec. 14, prompting Obama to declare that he will use all the powers of his office to reduce gun violence. Last week, the president appointed Vice President Biden to head a commission to develop new proposals that Obama will “push without delay” in January. Adding further complications to the timetable over the White House’s immigration strategy is the deadlocked negotiations over the looming “fiscal cliff” that could drag into the new year. Asked last week about Obama’s increasingly bloated agenda, White House press secretary Jay Carney declined to rank priorities.

#### FISA Amendment triggers

Bill Chappell (writer for National Public Radio) December 28, 2012 “Congress Extends FISA Wiretapping Act To 2017; Awaits Obama's Signature” http://www.npr.org/blogs/thetwo-way/2012/12/28/168220266/congress-extends-fisa-wiretapping-act-to-2017-awaits-obamas-signature

The FISA Amendments Act has been approved for another five years, as the Senate voted to renew the law that grants the government wide surveillance authority. President Obama has said he intends to sign the measure, which senators approved by a 73-23 margin Friday morning. It had already won approval in the House. The controversial bill, which allows federal agencies to eavesdrop on communications and review email without following an open and public warrant process, has long been a target for privacy and rights groups such as the Electronic Frontier Foundation and the American Civil Liberties Union, which is involved in a Supreme Court case over FISA. The original Foreign Intelligence Surveillance Act dates back to 1978; it was expanded during the Bush administration in 2008, to allow both foreign and domestic surveillance without a warrant, as long as the intent is to gather foreign intelligence. When it was amended in 2008, FISA also provided "retroactive immunity to the telecom companies that assisted the Bush administration in its warrantless wiretapping program," as Open Congress notes in its summary. Before Friday's vote, the 2012 FISA extension faced several attempts to amend it, including one made by Sen. Ron Wyden (D-Ore.), who sought to require the director of national intelligence to share information about telephone and email surveillance — how many Americans have been monitored, for instance, or whether communications between Americans is reviewed. The Wyden amendment was rejected by a 52-43 vote, an indication of the contentiousness surrounding the bill's granting of intelligence-gathering powers. The amendment had bipartisan support that included Democratic Sens. Al Franken and Patty Murray and Republican Sens. Dean Heller and Pat Toomey, among others. But the measure also faced bipartisan opposition. Sens. Dianne Feinstein (D-Calif.) and Saxby Chambliss (R-Ga.), the ranking members of the Senate Intelligence Committee, spoke against the Wyden amendment, with Feinstein saying it would expose "information about a very effective intelligence collection program that is currently classified." She added that the Senate Intelligence and Judiciary Committees already review all of the material.

#### Nuclear power has tons of political support.

Koplow, ‘11

[Doug, founder of Earth Track, Inc., has worked on natural resource subsidy issues for more than 20 years, mainly in the energy sector, holds a B.A. in economics from Wesleyan University, M.B.A. from the Harvard Graduate School of Business Administration, Union of Concerned Scientists, February, “Nuclear Power: Still Not Viable Without Subsidies,” http://www.ucsusa.org/assets/documents/nuclear\_power/nuclear\_subsidies\_report.pdf]

The industry and its allies are now pressuring all levels of government for large new subsidies to support the construction and operation of a new generation of reactors and fuel-cycle facilities. The substantial political support the industry has attracted thus far rests largely on an uncritical acceptance of the industry’s economic claims and an incomplete understanding of the subsidies that made—and continue to make—the existing nuclear fleet possible.

#### PC not key

**Klein, 3/19/12** [The Unpersuaded Who listens to a President? by [Ezra Klein](http://www.newyorker.com/magazine/bios/ezra_klein/search?contributorName=ezra%20klein) March 19, 2012, Ezra Klein is the editor of Wonkblog and a columnist at the Washington Post, as well as a contributor to MSNBC and Bloomberghttp://www.newyorker.com/reporting/2012/03/19/120319fa\_fact\_klein#ixzz1p36PrMbH]

This, Edwards says, is the reality facing modern Presidents, and one they would do well to accommodate. “In a rational world, strategies for governing should match the opportunities to be exploited,” he writes. “Barack Obama is only **the latest** in a **long line** of presidents who have not been able to transform the political landscape **through** their efforts at **persuasion**. When he succeeded in achieving major change, it was by mobilizing those ***predisposed* to support** him and driving legislation through Congress on a party-line vote.”

That’s easier said than done. We don’t have a system of government set up for Presidents to drive legislation through Congress. Rather, we have a system that was designed to encourage division between the branches but to resist the formation of political parties. The parties formed anyway, and they now use the branches to compete with one another. Add in minority protections like the filibuster, and you have a system in which the job of the President is to persuade an opposition party that has both the incentive and the power to resist him.

Jim Cooper says, “We’ve effectively lost our Congress and gained a parliament.” He adds, “At least a Prime Minister is empowered to get things done,” but “we have the extreme polarization of a parliament, with party-line voting, without the empowered Prime Minister.” And you can’t solve that with a speech.

#### Winners win

**Halloron, 10** [Liz, National Public Radio, “For Obama what a difference a win will make”, <http://www.npr.org/templates/story/story.php?storyId=125594396>]

Amazing what a win in a **major legislative battle** will do for a president's spirit. (Turmoil over spending and leadership at the Republican National Committee over the past week, and the release Tuesday of a major new and largely sympathetic book about the president by New Yorker editor David Remnick, also haven't hurt White House efforts to drive its own, new narrative.) Obama's Story New Yorkereditor David Remnick has a new book out about Obama. Listen to an interview with Remnick and read a review. ['The Bridge': Remnick On The Ascent Of Obama](http://www.npr.org/templates/story/story.php?storyId=125595945&ps=rs) April 6, 2010 ['Bridge' Tells Obama's Story, Just As We Remember It](http://www.npr.org/templates/story/story.php?storyId=125093691&ps=rs) April 5, 2010 Though the president's national job approval ratings failed to get a boost by the passage of the health care overhaul — his numbers have remained steady this year at just under 50 percent — he has earned grudging respect even from those who don't agree with his policies. "He's achieved something that virtually everyone in Washington thought he couldn't," says Henry Olsen, vice president and director of the business-oriented American Enterprise Institute's National Research Initiative. "And that's given him confidence." The protracted health care battle looks to have taught the White House something about power, says presidential historian Gil Troy — a lesson that will inform Obama's pursuit of his initiatives going forward. "I think that Obama realizes that **presidential power is a muscle**, and the more you exercise it, the stronger it gets," Troy says. "He exercised that power and had a success with health care passage, and now he wants to make sure people realize it's not just a blip on the map." The White House now has an opportunity, he says, to change the narrative that had been looming — that the Democrats would lose big in the fall midterm elections, and that Obama was looking more like one-term President Jimmy Carter than two-termer Ronald Reagan, who also managed a difficult first-term legislative win and survived his party's bad showing in the midterms. Approval Ratings Obama is exuding confidence since the health care bill passed, but his approval ratings as of April 1 remain unchanged from the beginning of the year, according to [Pollster.com](http://www.pollster.com/polls/us/jobapproval-obama.php). What's more, just as many people disapprove of Obama's health care policy now as did so at the beginning of the year. According to the most recent numbers: Forty-eight percent of all Americans approve of Obama, and 47 disapprove. Fifty-two percent disapprove of Obama's health care policy, compared with 43 percent who approve. **Stepping Back From A Precipice** Those watching the re-emergent president in recent days say it's difficult to imagine that it was only weeks ago that Obama's domestic agenda had been given last rites, and pundits were preparing their pieces on a failed presidency. Obama himself had framed the health care debate as a referendum on his presidency. A loss would have "ruined the rest of his presidential term," says Darrell West, director of governance studies at the liberal-leaning Brookings Institution. "It would have made it difficult to address other issues and emboldened his critics to claim he was a failed president." The conventional wisdom in Washington after the Democrats lost their supermajority in the U.S. Senate when Republican Scott Brown won the Massachusetts seat long held by the late Sen. Edward Kennedy was that Obama would scale back his health care ambitions to get something passed. "I thought he was going to do what most presidents would have done — take two-thirds of a loaf and declare victory," says the AEI's Olsen. "But he doubled down and made it a vote of confidence on his presidency, parliamentary-style." "You've got to be impressed with an achievement like that," Olsen says. But Olsen is among those who argue that, long-term, Obama and his party would have been better served politically by an incremental approach to reworking the nation's health care system, something that may have been more palatable to independent voters Democrats will need in the fall. "He would have been able to show he was listening more, that he heard their concerns about the size and scope of this," Olsen says. **Muscling out a win** on a sweeping health care package may have invigorated the president and **provided evidence of leadership**, but, his critics say, it remains to be seen whether Obama and his party can reverse what the polls now suggest is a losing issue for them. **Golden Boy Tested** One of the questions that has trailed Obama is how he would deal with criticism and the prospect of failure, says Troy, a McGill University history professor and visiting scholar affiliated with the bipartisan Policy Center in Washington. "He is one of those golden boys who never failed in his life, and people like that are often not used to criticism and failure," Troy says. Obama and his campaign were temporarily knocked for a loop early in the 2008 presidential campaign by then-GOP vice presidential candidate Sarah Palin's "zingers," Troy says, "and Obama was thrown off balance again by the loss of the Massachusetts Senate seat." The arc of the health care debate reminded observers that Obama is not just a product of Harvard, but also of tough Chicago politics, Troy says. "You don't travel as far and as fast as Barack Obama without having a spine of steel," he says. "He has an ability to regenerate, to come back, and knows that there is no such thing as a dirty win: a win is a win" — even if it infuriates the progressive wing of the president's party, which wanted far more sweeping changes to the nation's health care system. **GOP Stumbles** Obama's new mojo has been abetted, in a way, by high-profile troubles at the Republican National Committee. RNC Chairman Michael Steele has been under fire over the past week for his spending on private jets and limousines, and a staffer resigned after submitting to the committee a nearly $2,000 tab for a visit by young party members to a risque Los Angeles nightclub. The disarray intensified Monday with the resignation of the committee's chief of staff, and growing anger among top GOP strategists and fundraisers. "Steele has kept Republicans off-message," says West, of Brookings. "Every story about RNC spending is one less story about their views on health care at a time when news coverage has shifted in a more favorable direction." The distraction continued Monday when detractors accused Steele of playing the race card after he told ABC News that as an African American, he, like Obama, is being held to a higher standard. White House Spokesman Robert Gibbs, when asked about Steele's assertion, said the RNC chairman's problem "isn't the race card, it's the credit card." The controversy, Olsen says, hasn't been good for the Republicans' preparations for elections in terms of money and organization. But he doesn't view it as "a voter issue." **How Win Translates** When Reagan won his tough legislative battle in the early 1980s, it was over tax cuts, something voters saw as directly related to the then-dismal economy. Obama has long made a case for health care reform as a big piece of economic reform, but it's a difficult argument to make to voters, Olsen says, particularly when many of the health care law's major provisions don't go into effect for another four years. But observers like Troy say they believe that though initially unrelated, a boost in employment among Americans would encourage voters to look more favorably on the health care overhauls. "The perceived success of health care legislation rides on job creation," Troy says. Economists have recently declared the nation's recession, which began in 2007, over. But the unemployment rate has remained stubbornly at just under 10 percent. "I think he understands he's in a crucial period of his presidency," Olsen says. "He's taken a lot of risks, and there's not immediate rewards." Obama faces continuing tests on other big domestic issues, including Wall Street reform, the economy and climate change, as well as myriad foreign policy challenges ranging from testy relations with Israel and uncertainties about Iran's nuclear capabilities, to wars in Iraq and Afghanistan. Late last month, the administration and Russia agreed to a new nuclear arms treaty that is expected to be signed Thursday in advance of an international summit in Washington. The world is waiting, Troy says, to see how the president's renewed confidence plays out on the international stage. But the newly invigorated president continues to encourage voters to wait and see what his efforts produce.

### 2AC Security (short)

#### Framework – the k needs to prove the whole plan is bad– any other interp moots aff offense and decreases policy education

#### Epistemological debate is irrelevant - concrete action is inevitable - they fail to create useful knowledge

**Friedrichs, 09** [Jorg, University Lecturer in Politics at the Oxford Department of International Development, “From Positivist Pretense to Pragmatic Practice Varieties of Pragmatic Methodology in IR Scholarship” Pragmatism and International Relations]

As Friedrich Nietzsche ([1887] 1994:1; cf. Wilson 2002) knew, the knower isstrangely unknown to himself. In fact, it is much morehazardous to contemplate theway how we gain knowledge than to gain such knowledge in the ﬁrst place. This is not to deny that intellectuals are a narcissistic Kratochwil lot, with a penchant for omphaloskepsis. The typical result of their navel-gazing, however, is not increased self-awareness. Scholars are more likely to come up with ex-post-facto rationalizations of how they would like to see their activity than with accurate descriptions of how they go about business. As a result, in science there is a paradoxical divide between positivist pretenseand pragmatic practice. Many prominent scholars proceed pragmatically in gen-erating their knowledge, only to vest it all in a positivist cloak when it comes topresenting results. In the wake of Karl Popper (1963), fantasies about ingeniousconjectures and inexorable refutations continue to hold sway despite the muchmore prosaic way most scholars grope around in the formulation of their theo-ries, and the much less rigorous way they assess the value of their hypotheses. In proposing pragmatism as a more realistic alternative to positivist idealiza-tions, I am not concerned with the original intentions of Charles Peirce. Theseare discussed and enhanced by Ryto¨ vuori-Apunen (this forum). Instead, Ipresent various attempts to make pragmatism work as a methodology for IR scholarship. This includes my own preferred methodology, the pragmaticresearch strategy of abduction. As Fritz Kratochwil and I argue elsewhere, abduction should be at the center of our efforts, while deduction and induction areimportant but auxiliary tools (Friedrichs and 2009).Of course, one does not need to be a pragmatist to proceed in a pragmatic way. Precisely because it is derived from practice, pragmatic commonsense is a sold as the hills. For example, James Rosenau (1988:164) declared many yearsago that he coveted ‘‘a long-held conviction that one advances knowledge most effectively by continuously moving back and forth between very abstract and very empirical levels of inquiry, allowing the insights of the former to exert pressurefor the latter even as the ﬁndings of the latter, in turn, exert pressure for the for-mer, thus sustaining an endless cycle in which theory and research feed on eachother.’’ This was shortly before Rosenau’s turn to postmodernism, while he wasstill touting the virtues of behaviorism and standard scientiﬁc requisites, such asindependent and dependent variables and theory testing. But if we take his state-ment at face value, it appears that Rosenau-the-positivist was guided by a sort of pragmatism for all but the name. While such practical commonsense is certainly valuable, in and by itself, it does not qualify as scientiﬁc methodology. Science requires a higher degree of methodological awareness. For this reason, I am not interested here in pragma-tism as unspoken commonsense, or as a pretext for doing empirical researchunencumbered by theoretical and methodological considerations. Nor am I con-cerned with pragmatism as an excuse for staging yet another epistemological debate. Instead, I am interested in pragmatism as an instrument to go about research with an appropriate degree of epistemological and methodologicalawareness. Taking this criterion as my yardstick, the following three varieties of pragmatist methodology in recent IR scholarship are worth mentioning: theory synthesis, analytic eclecticism (AE), and abduction.Theory synthesis is proposed by Andrew Moravcsik (2003), who claims that theories can be combined as long as they are compatible at some unspeciﬁedfundamental level, and that data will help to identify the right combination of theories. He does not explicitly invoke pragmatism but vests his pleading in apositivist cloak by using the language of theory testing. When looking closer,however, it becomes apparent that his theoretical and methodological noncha-lance is far more pragmatic than what his positivist rhetoric suggests. Moravcsiksees himself in good company, dropping the following names: Robert Keohane,Stephen Walt, Jack Snyder, Stephen Van Evera, Bary Buzan, Bruce Russett, John O’Neal, Martha Finnemore, and Kathryn Sikkink. With the partial excep-tion of Finnemore, however, none of these scholars explicitly links his or herscholarship to pragmatism. They employ pragmatic commonsense in theirresearch, but devoutly ignore pragmatism as a philosophical and methodologicalposition. As a result, it is fair to say that theory synthesis is only on a slightly higher level of intellectual awareness than Rosenau’s statement quoted above. Analytic eclecticism, as advertized by Peter Katzenstein and Rudra Sil, links acommonsensical approach to empirical research with a more explicit commit-ment to pragmatism (Sil and Katzenstein 2005; Katzenstein and Sil 2008).The 7 Even the dean of critical rationalism, Karl Popper, is ‘‘guilty’’ of lapses into pragmatism, for example when hestates that scientists, like hungry animals, classify objects according to needs and interests, although with the impor-tant difference that they are guided in their quest for ﬁnding regularities not so much by the stomach but ratherby empirical problems and epistemic interests (Popper 1963:61–62). 646 Pragmatism and International Relations idea is to combine existing research traditions in a pragmatic fashion and thusto enable the formulation and exploration of novel and more complex sets of problems. The constituent elements of different research traditions are trans-lated into mutually compatible vocabularies and then recombined in novel ways.This implies that most scholars must continue the laborious process of formulat-ing parochial research traditions so that a few cosmopolitan colleagues will beenabled to draw upon their work and construct syncretistic collages. 8 In additionto themselves, Katzenstein and Sil cite a number of like-minded scholars such asCharles Tilly, Sidney Tarrow, Paul Pierson, and Robert Jervis. 9 The ascription isprobably correct given the highly analytical and eclectic approach of these schol-ars. Nevertheless, apart from Katzenstein and Sil themselves none of these schol-ars has explicitly avowed himself to AE.My preferred research strategy is abduction, which is epistemologically asself-aware as AE but minimizes the dependence on existing research traditions.The typical situation for abduction is when we, both in everyday life and as socialscientists, become aware of a certain class of phenomena that interests us for somereason, but for which we lack applicable theories. We simply trust, although we donot know for certain, that the observed class of phenomena is not random. Wetherefore start collecting pertinent observations and, at the same time, applyingconcepts from existing ﬁelds of our knowledge. Instead of trying to impose anabstract theoretical template (deduction) or ‘‘simply’’ inferring propositions fromfacts (induction), we start reasoning at an intermediate level (abduction). Abduction follows the predicament that science is, or should be, above all amore conscious and systematic version of the way by which humans have learnedto solve problems and generate knowledge in their everyday lives. As it iscurrently practiced, science is often a poor emulator of what we are able toachieve in practice. This is unfortunate because human practice is the ultimatemiracle. In our own practice, most of us manage to deal with many challenging situations. The way we accomplish this is completely different from**,** and far moreefﬁcient than, the way knowledge is generated according to standard scientiﬁc methods. If it is true that in our own practice we proceed not so much by induction or deduction but rather by abduction, then science would do well tomimic this at least in some respects. 10 Abduction has been invoked by numerous scholars, including Alexander Wendt, John Ruggie, Jeffrey Checkel, Martin Shapiro, Alec Stone Sweet, andMartha Finnemore. While they all use the term abduction, none has ever thor-oughly speciﬁed its meaning. To make up for this omission, I have developedabduction into an explicit methodology and applied it in my own research oninternational police cooperation (Friedrichs 2008). Unfortunately, it is impossi-ble to go into further detail here. Readers interested in abduction as a way toadvance international research and methodology can also be referred to my recent article with Fritz Kratochwil (Friedrichs and Kratochwil 2009).On a ﬁnal note, we should be careful not to erect pragmatism as the ultimateepistemological fantasy to caress the vanity of Nietzschean knowers unknown tothemselves, namely that they are ingeniously ‘‘sorting out’’ problematic situa-tions. Scientiﬁc inquiry is not simply an intimate encounter between a researchproblem and a problem solver. It is a social activity taking place in communitiesof practice (Wenger 1998). Pragmatism must be neither reduced to the utility of results regardless of their social presuppositions and meaning, nor to the 8 Pace Rudra Sil (this forum), the whole point about eclecticism is that you rely on existing traditions to blendthem into something new. There is no eclecticism without something to be eclectic about. 9 One may further expand the list by including the international society approach of the English school (Ma-kinda 2000), as well as the early Kenneth Waltz (1959). 10 Precisely for this reason, abduction understood as ‘Inference to the Best Explanation’ plays a crucial role inthe ﬁeld of Artiﬁcial Intelligence. 647 The Forum fabrication of consensus among scientists. Pragmatism as the practice of dis-cursive communities and pragmatism as a device for the generation of useful knowledge are two sides of the same coin

#### Rejection of securitization causes the state to become more interventionist—turns the K

Tara **McCormack, ’10**, is Lecturer in International Politics at the University of Leicester and has a PhD in International Relations from the University of Westminster. 2010, (Critique, Security and Power: The political limits to emancipatory approaches, page 127-129)

The following section will briefly raise some questions about the rejection of the old security framework as it has been taken up by the most powerful institutions and states. Here we can begin to see the political limits to critical and emancipatory frameworks. In an international system which is marked by great power inequalities between states, the rejection of the old narrow national interest-based security framework by major international institutions, and the adoption of ostensibly emancipatory policies and policy rhetoric, has the consequence of **problematising weak or unstable states** and allowing international institutions or major states a more interventionary role, yet without establishing mechanisms by which the citizens of states being intervened in might have any control over the agents or agencies of their emancipation. Whatever the problems associated with the pluralist security framework **there were at least formal and clear demarcations**. This has the consequence of **entrenching international power inequalities** and allowing for a shift towards a hierarchical international order in which the citizens in weak or unstable states may arguably have even less freedom or power than before. Radical critics of contemporary security policies, such as human security and humanitarian intervention, argue that we see an assertion of Western power and the creation of liberal subjectivities in the developing world. For example, see Mark Duffield’s important and insightful contribution to the ongoing debates about contemporary international security and development. Duffield attempts to provide a coherent empirical engagement with, and theoretical explanation of, these shifts. Whilst these shifts, away from a focus on state security, and the so-called merging of security and development are often portrayed as positive and progressive shifts that have come about because of the end of the Cold War, Duffield argues convincingly that these shifts are highly problematic and unprogressive. For example, the rejection of sovereignty as formal international equality and a presumption of nonintervention has eroded the division between the international and domestic spheres and led to an international environment in which Western NGOs and powerful states have a major role in the governance of third world states. Whilst for supporters of humanitarian intervention this is a good development, Duffield points out the depoliticising implications, drawing on examples in Mozambique and Afghanistan. Duffield also draws out the problems of the retreat from modernisation that is represented by sustainable development. The Western world has moved away from the development policies of the Cold War, which aimed to develop third world states industrially. Duffield describes this in terms of a new division of human life into uninsured and insured life. Whilst we in the West are ‘insured’ – that is we no longer have to be entirely self-reliant, we have welfare systems, a modern division of labour and so on – sustainable development aims to teach populations in poor states how to survive in the absence of any of this. Third world populations must be taught to be self-reliant, they will remain uninsured. Self-reliance of course means **the condemnation of millions to** **a barbarous life of inhuman bare survival**. Ironically, although sustainable development is celebrated by many on the left today, by leaving people to fend for themselves rather than developing a society wide system which can support people, sustainable development actually leads to a less human and humane system than that developed in modern capitalist states. Duffield also describes how many of these problematic shifts are embodied in the contemporary concept of human security. For Duffield, we can understand these shifts in terms of Foucauldian biopolitical framework, which can be understood as a regulatory power that seeks to support life through intervening in the biological, social and economic processes that constitute a human population (2007: 16). Sustainable development and human security are for Duffield technologies of security which aim to *create* self-managing and self-reliant subjectivities in the third world, which can then survive in a situation of serious underdevelopment (or being uninsured as Duffield terms it) without causing security problems for the developed world. For Duffield this is all driven by a neoliberal project which seeks to control and manage uninsured populations globally. Radical critic Costas Douzinas (2007) also criticises new forms of cosmopolitanism such as human rights and interventions for human rights as a triumph of American hegemony. Whilst we are in agreement with critics such as Douzinas and Duffield that these new security frameworks cannot be empowering, and ultimately lead to more power for powerful sta**tes**, we need to understand why these frameworks have the effect that they do. We can understand that these frameworks have political limitations without having to look for a specific plan on the part of current powerful states. In new security frameworks such as human security we can see the political limits of the framework proposed by critical and emancipatory theoretical approaches.

#### Util

#### No lash out – institutional safeguards check

Buchanan 7 [Allen, Professor of Philosophy and Public Policy at Duke, 2007, Preemption: military action and moral justification, pg. 128]

The intuitively plausible idea behind the 'irresponsible act' argument is that, other things being equal, the higher the stakes in acting and in particular the greater the moral risk, the higher are the epistemic requirements for justified action. The decision to go to war is generally a high stakes decision par excellence and the moral risks are especially great, for two reasons. First, unless one is justified in going to war, one's deliberate killing of enemy combatants will he murder, indeed mass murder. Secondly, at least in large-scale modem war, it is a virtual certainty that one will kill innocent people even if one is justified in going to war and conducts the war in such a way as to try to minimize harm to innocents. Given these grave moral risks of going to war, quite apart from often substantial prudential concerns, some types of justifications for going to war may simply be too subject to abuse and error to make it justifiable to invoke them. The 'irresponsible act' objection is not a consequentialist objection in any interesting sense. It does not depend upon the assumption that every particular act of going to war preventively has unacceptably bad consequences (whether in itself or by virtue of contributing lo the general acceptance of a principle allowing preventive war); nor does it assume that it is always wrong lo rely on a justification which, if generally accepted, would produce unacceptable consequences. Instead, the "irresponsible act' objection is more accurately described as an agent-centered argument and more particularly an argument from moral epistemic responsibility. The 'irresponsible act' objection to preventive war is highly plausible if— but only if—one assumes that the agents who would invoke the preventive-war justification are, as it were, on their own in making the decision to go to war preventively. In other words, the objection is incomplete unless the context of decision-making is further specified. Whether the special risks of relying on the preventive-war justification are unacceptably high will depend, inter alia, upon whether the decision-making process includes effective provisions for redu­cing those special risks. Because the special risks are at least in significant part epistemic—due to the inherently speculative character of the preventive war-justification—the epistemic context of the decision is crucial. Because institutions can improve the epistemic performance of agents, it is critical to know what the institutional context of the preventive-war decision is, before we can regard the 'irresponsible agent' objection as conclusive. Like the 'bad practice' argument, this second objection to preventive war is inconclusive because it does not consider— and rule out—the possibility that well-designed institutions for decision-making could address the problems that would otherwise make it irresponsible for a leader to invoke the preventive-war justification.

#### Perm do the plan and address the root cause—either the perm solves or the alt does nothing

#### State focused nuclear power solutions key – solves their impact better

Nordhaus 11, chairman – Breakthrough Instiute, and Shellenberger, president – Breakthrough Insitute, MA cultural anthropology – University of California, Santa Cruz, 2/25/‘11

(Ted and Michael, <http://thebreakthrough.org/archive/the_long_death_of_environmenta>)

Tenth, we are going to have to get over our suspicion of technology, especially nuclear power. There is no credible path to reducing global carbon emissions without an enormous expansion of nuclear power. It is the only low carbon technology we have today with the demonstrated capability to generate large quantities of centrally generated electrtic power. It is the low carbon of technology of choice for much of the rest of the world. Even uber-green nations, like Germany and Sweden, have reversed plans to phase out nuclear power as they have begun to reconcile their energy needs with their climate commitments. Eleventh, we will need to embrace again the role of the state as a direct provider of public goods. The modern environmental movement, borne of the new left rejection of social authority of all sorts, has embraced the notion of state regulation and even creation of private markets while largely rejecting the generative role of the state. In the modern environmental imagination, government promotion of technology - whether nuclear power, the green revolution, synfuels, or ethanol - almost always ends badly. Never mind that virtually the entire history of American industrialization and technological innovation is the story of government investments in the development and commercialization of new technologies. Think of a transformative technology over the last century - computers, the Internet, pharmaceutical drugs, jet turbines, cellular telephones, nuclear power - and what you will find is government investing in those technologies at a scale that private firms simply cannot replicate. Twelveth, big is beautiful. The rising economies of the developing world will continue to develop whether we want them to or not. The solution to the ecological crises wrought by modernity, technology, and progress will be more modernity, technology, and progress. The solutions to the ecological challenges faced by a planet of 6 billion going on 9 billion will not be decentralized energy technologies like solar panels, small scale organic agriculture, and a drawing of unenforceable boundaries around what remains of our ecological inheritance, be it the rainforests of the Amazon or the chemical composition of the atmosphere. Rather, these solutions will be: large central station power technologies that can meet the energy needs of billions of people increasingly living in the dense mega-cities of the global south without emitting carbon dioxide, further intensification of industrial scale agriculture to meet the nutritional needs of a population that is not only growing but eating higher up the food chain, and a whole suite of new agricultural, desalinization and other technologies for gardening planet Earth that might allow us not only to pull back from forests and other threatened ecosystems but also to create new ones. The New Ecological Politics The great ecological challenges that our generation faces demands an ecological politics that is generative, not restrictive. An ecological politics capable of addressing global warming will require us to reexamine virtually every prominent strand of post-war green ideology. From Paul Erlich's warnings of a population bomb to The Club of Rome's "Limits to Growth," contemporary ecological politics have consistently embraced green Malthusianism despite the fact that the Malthusian premise has persistently failed for the better part of three centuries. Indeed, the green revolution was exponentially increasing agricultural yields at the very moment that Erlich was predicting mass starvation and the serial predictions of peak oil and various others resource collapses that have followed have continue to fail. This does not mean that Malthusian outcomes are impossible, but neither are they inevitable. We do have a choice in the matter, but it is not the choice that greens have long imagined. The choice that humanity faces is not whether to constrain our growth, development, and aspirations or die. It is whether we will continue to innovate and accelerate technological progress in order to thrive. Human technology and ingenuity have repeatedly confounded Malthusian predictions yet green ideology continues to cast a suspect eye towards the very technologies that have allowed us to avoid resource and ecological catastrophes. But such solutions will require environmentalists to abandon the "small is beautiful" ethic that has also characterized environmental thought since the 1960's. We, the most secure, affluent, and thoroughly modern human beings to have ever lived upon the planet, must abandon both the dark, zero-sum Malthusian visions and the idealized and nostalgic fantasies for a simpler, more bucolic past in which humans lived in harmony with Nature.

### States CP 2AC

#### Conditionality is bad – generates 2ac strategic skew by disincentivizng best use of offense – creates argumentative irresponsibility making debate poor advocate training – rigorous pre-round research solves offense

#### 50 state fiat is a voting issue – no decision makers controls state policy, kills logic which justifies infinite intrinsicness – no solvency advocate kills fairness and undermines core research skills – kills real world education

#### Perm do both – state action provides cover and acts like a mandate for Obama

#### Counterplan makes investors uncertain

#### A. Skin in the game – investors want to see federal government support for tech to resolve regulatory uncertainty – that’s Adams – this certainty is key

**Gale et al. ‘9** (FINANCING THE NUCLEAR RENAISSANCE: THE BENEFITS AND POTENTIAL PITFALLS OF FEDERAL & STATE GOVERNMENT SUBSIDIES AND THE FUTURE OF NUCLEAR POWER IN CALIFORNIA Sony Ben-Moshe, Jason J. Crowell, Kelley M. Gale,\* Breton A. Peace, Brett P. Rosenblatt, and Kelly D. Thomason\*\* \* Kelley Michael Gale is the Finance Department Chair of Latham & Watkins‘ San Diego office and serves as global Co-Chair for the firm‘s Climate Change and Cleantech Practice Groups. He has thirty years of experience representing private and public sector clients in the development, regulation, and financing of alternative energy projects and capital intensive infrastructure projects. \*\* The co-authors are attorneys in the Project Finance Practice Group in the San Diego office of Latham & Watkins LLP. The views expressed in this article are those of the authors and do not reflect the views of Latham & Watkins LLP or its clients. 498 ENERGY LAW JOURNAL [Vol. 30:497 2009

Similar to this political risk, **investors in new domestic nuclear reactors will likely face substantial regulatory and permitting risks, such as the risk of litigation** by residents or environmentalists desiring to thwart any large scale development of new reactors in the United States **and** the risk that **a** largely **untested** **regulatory approval process** may not operate as anticipated, and **those** challenges **can result in significant delays** in construction of a nuclear power project. Although they are different in kind, the substance of sovereign and other risks facing large overseas infrastructure projects is similar in the sense that worst case scenarios of delay or inability to make commercial use of the projects and the magnitude of the potential losses are roughly equivalent. As a risk mitigation measure in the case of financings for natural gas liquefaction facilities and other large overseas infrastructure projects, the Export-Import Bank of the United States may approve loan guarantees and offer credit enhancements and/or direct loans to support the sale of United States exports to emerging markets throughout the world. Its loan guarantees to support the construction of large overseas infrastructure projects increase the comfort of private institutional investors because these investors believe there is a substantially lower risk that an overseas political regime will change the rules in a manner adverse to creditors if the United States government is one of those creditors.34 In a similar fashion, regulatory risk insurance and loan guarantees provided by **the federal government should encourage** private financing of domestic nuclear power projects **because the government** providing the guarantees **also** **controls many of the risk factors which could give rise to regulatory delays** in commencing commercial operation of a new nuclear project. Further, in the nuclear power industry, **the federal government is reviewing** development **applications and reactor designs**, and is equipped with a **team of experts** in nuclear technologies, so that **if the federal government has skin in the game,** so to speak, **private lenders may take** additional **comfort** that **the government has performed a** certain level of **due diligence** **on a particular project and determined that there are no major flaws from its vantage point**. Section II.D.3 below discusses the risks covered by federally provided regulatory risk insurance and the ways in which it can be adapted to best encourage private sector financing for nuclear energy.

#### B. States incentives fail – capital costs

Ben Moshe, et al 2011 [Kelley Michael Gale is the Finance Department Chair of Latham & Watkins‘ San Diego office and serves as global Co-Chair for the firm‘s Climate Change and Cleantech Practice Groups. He has thirty years of experience representing private and public sector clients in the development, regulation, and financing of alternative energy projects and capital intensive infrastructure projects. The co-authors are attorneys in the Project Finance Practice Group in the San Diego office of Latham & Watkins LLP. The views expressed in this article are those of the authors and do not reflect the views of Latham & Watkins LLP or its clients. FINANCING THE NUCLEAR RENAISSANCE: THE BENEFITS AND POTENTIAL PITFALLS OF FEDERAL & STATE GOVERNMENT SUBSIDIES AND THE FUTURE OF NUCLEAR POWER IN CALIFORNIA Sony Ben-Moshe, Jason J. Crowell, Kelley M. Gale,\* Breton A. Peace, Brett P. Rosenblatt, and Kelly D. Thomason\*\*, p. google]

A primary reason why the financing of a nuclear power project may resemble a Mega-Financing is the sheer magnitude of capital required to finance project construction.32 Absent proper government incentives, the required capital may not be obtainable at optimal pricing for reasons aside from the intercreditor issues noted above. Lending institutions often have caps on the amount of capital that can be exposed to both a particular project and a specific industry sector. In addition, regulatory and construction risks at any given project will limit any particular investor‘s desire to put too much money into any one project. As a practical reality, this desire to diversify against risk and the sheer magnitude of debt capital needed for any project may limit the amount of debt a project sponsor can raise in the commercial bank and capital markets. Government issued loan guarantees present one way to potentially decrease perceived risk and thereby increase the amount of money an investor is willing to put into a project and bring to the table investors who might otherwise not be interested (for example, certain institutional investors may only invest in instruments backed by the full faith and credit of the United States Government). To optimize nuclear development in the United States, the specifics of the government support programs should be adjusted in ways necessary to reach the point whereupon lending institutions can invest sufficient capital for nuclear construction as part of a well-balanced portfolio of assets. Specific adjustments that may help reach this point are discussed in Section II.D.2 below. Nuclear power project financing also may more closely resemble a Mega- Financing than a traditional project financing of a renewable power project due to the unusual risks presented by construction of a nuclear reactor. One of the key issues involved in many Mega-Financings (particularly cross-border financings) is political risk and uncertainty. Natural gas liquefaction projects, for example, often take place in less developed countries in South America and West Africa, where political risk factors abound, including currency conversion risk, sovereign risk and environmental issues presented by investing in the global market. ―No matter how detailed a contract, a new political regime could change the rules and the conditions under which you made your investment virtually overnight.‖33 Similar to this political risk, investors in new domestic nuclear reactors will likely face substantial regulatory and permitting risks, such as the risk of litigation by residents or environmentalists desiring to thwart any large scale development of new reactors in the United States and the risk that a largely untested regulatory approval process may not operate as anticipated, and those challenges can result in significant delays in construction of a nuclear power project. Although they are different in kind, the substance of sovereign and other risks facing large overseas infrastructure projects is similar in the sense that worst case scenarios of delay or inability to make commercial use of the projects and the magnitude of the potential losses are roughly equivalent. As a risk mitigation measure in the case of financings for natural gas liquefaction facilities and other large overseas infrastructure projects, the Export-Import Bank of the United States may approve loan guarantees and offer credit enhancements and/or direct loans to support the sale of United States exports to emerging markets throughout the world. Its loan guarantees to support the construction of large overseas infrastructure projects increase the comfort of private institutional investors because these investors believe there is a substantially lower risk that an overseas political regime will change the rules in a manner adverse to creditors if the United States government is one of those creditors.34 In a similar fashion, regulatory risk insurance and loan guarantees provided by the federal government should encourage private financing of domestic nuclear power projects because the government providing the guarantees also controls many of the risk factors which could give rise to regulatory delays in commencing commercial operation of a new nuclear project. Further, in the nuclear power industry, the federal government is reviewing development applications and reactor designs, and is equipped with a team of experts in nuclear technologies, so that if the federal government has skin in the game, so to speak, private lenders may take additional comfort that the government has performed a certain level of due diligence on a particular project and determined that there are no major flaws from its vantage point. Section II.D.3 below discusses the risks covered by federally provided regulatory risk insurance and the ways in which it can be adapted to best encourage private sector financing for nuclear energy. Against the backdrop of this larger structuring discussion, as we look at different public support and incentive programs designed to spur development, we must bear in mind that the efficacy of these programs will depend on whether and how well they work in the context of larger, more complicated financing structures.35 In fact, the very complexity of intercreditor relationships in different deal structures may run counter to the government‘s adopted goal of standardizing and streamlining the development and financing of new nuclear projects.36 As a practical matter, not only must the credit support programs work in the context of these complex financings, but the government may also have to be involved in the structuring of these financings, taking a seat at the table to customize each transaction.

#### Certainty is essential – only effective method of catalyzing investment

**Whitefield, 11** [5/4/11, STATEMENT OF THE HONORABLE ED WHITFIELD CHAIRMAN, SUBCOMMITTEE ON ENERGY AND POWER, “The Role of the Nuclear Regulatory Commission in America’s Energy Future, http://republicans.energycommerce.house.gov/Media/file/Hearings/Energy/050411/Whitfield.pdf

While the NRC may not be the direct cause of this uncertainty – the Obama Administration’s policy is - the NRC’s actions will contribute to the uncertainty one way or another. Beyond open adjudicatory issues, the NRC has recently taken administrative action to close down its review of Yucca Mountain, which will deprive the public of the first independent government assessment of the merits of Yucca Mountain’s construction. That doesn’t bode well for a nuclear renaissance. On the front end of nuclear power development, I’m very interested to hear about whether the NRC can develop and provide more regulatory certainty in its licensing and re-licensing programs. As in other energy sectors, regulatory certainty, such as keeping to decision schedules, is essential for ensuring the investments necessary to develop nuclear energy. Additionally, I think it is worth reviewing the Commission’s organizational structure, and whether an agency rightly focused on safety is suitably structured to also facilitate the advancement of new nuclear generation. And connected with regulatory certainty, are clear and well developed safety engineering evaluations. As mentioned, the safety record of NRC is unparalleled. But recent events in Japan have raised questions in the public’s mind about how well the NRC does its job. We need to be confident the NRC is up to the task. I believe the agency is, but scrutiny is helpful to maintain the public trust. We do not want to overreact to events based on poor and faulty information or other political agendas. Nuclear power is critical to this nation. We should recognize its importance for a growing economy and not lose sight of the tremendous value a reliable, affordable power supply will mean for the future health and wealth of the United States.

#### Can’t solve nuclear leadership – not perceived

Fertel, 05 - Senior Vice President And Chief Nuclear Officer Nuclear Energy Institute (Marvin, CQ Congressional Testimony, “NUCLEAR POWER'S PLACE IN A NATIONAL ENERGY POLICY,” 4/28, lexis) //DH

Industry and government will be prepared to meet the demand for new emission-free baseload nuclear plants in the 2010 to 2020 time frame only through a sustained focus on the necessary programs and policies between now and then. As it has in the past, strong Congressional oversight will be necessary to ensure effective and efficient implementation of the federal government's nuclear energy programs, and to maintain America's leadership in nuclear technology development and its influence over important diplomatic initiatives like nonproliferation. Such efforts have provided a dramatic contribution to global security, as evidenced by the U.S.-Russian nonproliferation agreement to recycle weapons-grade material from Russia for use in American reactors. Currently, more than 50 percent of U.S. nuclear power plant fuel depends on converted Russian warhead material. Nowhere is continued congressional oversight more important than with DOE's program to manage the used nuclear fuel from our nuclear power plants. Continued progress toward a federal used nuclear fuel repository is necessary to support nuclear energy's vital role in a comprehensive national energy policy and to support the remediation of DOE defense sites. Since enactment of the 1982 Nuclear Waste Policy Act, DOE's federal repository program has repeatedly overcome challenges, and challenges remain before the Yucca Mountain facility can begin operation. But as we address these issues, it is important to keep the overall progress of the program in context. There is international scientific consensus that a deep geologic repository is the best solution for long-term disposition of used military and commercial nuclear power plant fuel and high-level radioactive byproducts. The Bush administration and Congress, with bipartisan support, affirmed the suitability of Yucca Mountain for a repository in 2002. Over the past three years, the Energy Department and its contractors have made considerable progress providing yet greater confirmation that this is the correct course of action and that Yucca Mountain is an appropriate site for a national repository. --During the past year, federal courts have rejected significant legal challenges by the state of Nevada and others to the Nuclear Waste Policy Act and the 2002 Yucca Mountain site suitability determination. These challenges questioned the constitutionality of the Yucca Mountain Development Act and DOE's repository system, which incorporates both natural and engineered barriers to contain radioactive material safely. In the coming year, Congress will play an essential role in keeping this program on schedule, by taking the steps necessary to provide increased funding for the project in fiscal 2006 and in future years. Meeting DOE's schedule for initial repository operation requires certainty in funding for the program. This is particularly critical in view of projected annual expenditures that will exceed $1 billion beginning in fiscal 2007. Meeting these budget requirements calls for a change in how Congress provides funds to the project from monies collected for the Nuclear Waste Fund. The history of Yucca Mountain funding is evidence that the current funding approach must be modified. Consumer fees (including interest) committed to the Nuclear Waste Fund since its f6rmation in 1983 total more than $24 billion. Consumers are projected to pay between $750 million to $800 million to the fund each year, based on electricity generated at the nation's 103 reactors. This is more than $2 million per day. Although about $8 billion has been used for the program, the balance in the fund is nearly $17 billion. In each of the past several years, there has been a gap between the annual fees paid by consumers of electricity from nuclear power plants and disbursements from the fund for use by DOE at Yucca Mountain. Since the fund was first established, billions of dollars paid by consumers of electricity from nuclear power plants to the Nuclear Waste Fund-intended solely for the federal government's used fuel program-in effect have been used to decrease budget deficits or increase surpluses. The industry believes that Congress should change the funding mechanism for Yucca Mountain so that payments to the Nuclear Waste Fund can be used only for the project and be excluded from traditional congressional budget caps. Although the program should remain subject to congressional oversight, Yucca Mountain appropriations should not compete each year for funding with unrelated programs when Congress directed a dedicated funding stream for the project.¶ The industry also believes that it is appropriate and necessary to consider an alternative perspective on the Yucca Mountain project. This alternative would include an extended period for monitoring operation of the repository for up to 300 years after spent fuel is first placed underground. The industry believes that this approach would provide ongoing assurance and greater confidence that the repository is performing as designed, that public safety is assured, and that the environment is protected. It would also permit DOE to apply evolving innovative technologies at the repository. Through this approach, a scientific monitoring program would identify additional scientific information that can be used in repository performance models. The project then could update the models, and make modifications in design and operations as appropriate.¶ Congressional committees like this one can help ensure that DOE does not lose sight of its responsibility for used nuclear fuel management and disposal, as stated by Congress in the Nuclear Waste Policy Act of 1982. The industry fully supports the fundamental need for a repository so that used nuclear fuel and the byproducts of the nation's nuclear weapons program are securely managed in an underground, specially designed facility. World-class science has demonstrated that Yucca Mountain is the best site for that facility. A public works project of this magnitude will inevitably face challenges. Yet, none is insurmountable. DOE and its contractors have made significant progress on the project and will continue to do so as the project enters the licensing phase. Congressional oversight also can play a key role in maintaining and encouraging the stability of the NRC's regulatory process. Such stability is essential for our 103 operating nuclear plants and equally critical in licensing new nuclear power plants. Congress played a key role several years ago in encouraging the NRC to move toward a new oversight process for the nation's nuclear plants, based on quantitative performance indicators and safety significance. Today's reactor oversight process is designed to focus industry and NRC resources on equipment, components and operational issues that have the greatest importance to, and impact on, safety. The NRC and the industry have worked hard to identify and implement realistic security requirements at nuclear power plants. In the three-and-a-half years since 9/11, the NRC has issued a series of requirements to increase security and enhance training for security programs. The industry complied-fully and rapidly.¶ In the days and months following Sept. 11, quick action was required. Orders that implemented needed changes quickly were necessary. Now, we should return to the orderly process of regulating through regulations.¶ The industry has spent more than $1 billion enhancing security since September 2001. We've identified and fixed vulnerabilities. Today, the industry is at the practical limit of what private industry can do to secure our facilities against the terrorist threat. NRC Chairman Nils Diaz and other commissioners have said that the industry has achieved just about everything that can be reasonably achieved by a civilian force.¶ The industry now needs a transition period to stabilize the new security requirements. We need time to incorporate these dramatic changes into our operations and emergency planning programs and to train our employees to the high standards of our industry-and to the appropriately high expectations of the NRC.¶ Both industry and the NRC need congressional oversight to support and encourage this kind of stability.¶ CONCLUSION¶ Electricity generated by America's nuclear power plants over the past half-century has played a key part in our nation's growth and prosperity. Nuclear power produces over 20 percent of the electricity used in the United States today without producing air pollution. As our energy demands continue to grow in years to come, nuclear power should play an even greater role in meeting our energy and environmental needs.¶ The nuclear energy industry is operating its reactors safely and efficiently. The industry is striving to produce more electricity from existing plants. The industry is also developing more efficient, next-generation reactors and exploring ways to build them more cost-effectively.¶ The public sector, including the oversight committees of the U.S. Congress, can help maintain the conditions that ensure Americans will continue to reap the benefits of our operating plants, and create the conditions that will spur investment in America's energy infrastructure, including new nuclear power plants.¶ One important step is passage of comprehensive energy legislation that recognizes nuclear energy's contributions to meeting our growing energy demands, ensuring our nation's energy security and protecting our environment. Equally important, however, is the need to ensure effective and efficient implementation of existing laws, like the Nuclear Waste Policy Act, and to provide federal agencies with the resources and oversight necessary to discharge their statutory responsibilities in the most efficient way possible. The commercial nuclear power sector was born in the United States, and nations around the world continue to look to this nation for leadership in this technology and in the issues associated with nuclear power. Our ability to influence critical international policies in areas like nuclear nonproliferation, for example, depends on our ability to maintain a leadership role in prudent deployment, use and regulation of nuclear energy technologies here at home, in the United States, and on our ability to manage the technological and policy challenges-like waste management-that arise with all advanced technologies.

#### Doesn’t solve the case – restrictions are codified in federal law – prevents the **requisite licensing**, means the cp fails to cause commercialization – that’s 1ac Martin AND

MIT, 10 [Massachusetts Institute of Technology, “Nuclear Energy Research and Development Roadmap: Report to Congress”, April 2010, http://ocw.mit.edu/courses/nuclear-engineering/22-033-nuclear-systems-design-project-fall-2011/readings/MIT22\_033F11\_read\_core\_doe.pdf]

 In the United States, it is the responsibility of industry to design, construct, and operate commercial nuclear power plants. However, DOE has statutory authority under the Atomic Energy Act to promote and support nuclear energy technologies for commercial applications. In general, appropriate government roles include researching high-potential technologies beyond the investment horizon of industry and also reducing the technical risks of new technologies. In the case of new commercial reactor designs, potential areas of NE involvement could include: Enabling new technologies to be inserted into emerging and future designs by providing access to unique laboratory resources for new technology development and, where appropriate, demonstration. • Working through the laboratories and universities to provide unique expertise and facilities to industry for R&D in the areas of: o Innovative concepts and advanced technologies. o Fundamental phenomena and performance data. o Advanced modeling and simulation capabilities. APRIL 2010 22 34 NUCLEAR ENERGY RESEARCH AND DEVELOPMENT ROADMAP o New technology testing and, if appropriate, demonstration. o Advanced manufacturing methods. Representative R&D activities that support each of the roles stated above are presented below. The level of DOE investment relative to industry investment will vary across the spectrum of these activities, with a generally increasing trend in DOE investment for longer-term activities. Finally, there is potential to leverage and amplify effective U.S. R&D through collaborations with other nations through multilateral and bilateral agreements including the Generation IV International Forum, which is investigating multiple advanced reactor concepts. DOE is also a participant in OECD/NEA and IAEA initiatives that bear directly on the development and deployment of new reactor systems.

#### States links to politics

Kiely ‘12 [[EUGENE KIELY](http://www.factcheck.org/author/eugene-kiely/), Washington assignment editor USA today, February 17, 2012 Factcheck.org “Did Obama ‘Approve’ Bridge Work for Chinese Firms?” http://www.factcheck.org/2012/02/did-obama-approve-bridge-work-for-chinese-firms/]

Who’s to blame, if that’s the right word, if the project ends up using manufactured steel from China? The National Steel Bridge Alliance blames the state railroad agency. The Alliance for American Manufacturing says the federal Buy American laws have been “weakened with loopholes and various exemptions that make it easier for bureaucrats to purchase foreign-made goods instead of those made in American factories with American workers.” So, how did **Obama get blamed** for the decisions by state agencies and for state projects that, in at least one case**, didn’t even use federal funds?** The answer is a textbook lesson in how **information gets distorted** when emails go viral. We looked at the nearly 100 emails we received on this subject and found that Obama wasn’t mentioned at all in the first few emails. Typical of the emails we received shortly after the ABC News report aired was this one from Oct. 11, 2011: “I just got an email regarding Diane Sawyer on ABC TV stating that U. S. Bridges and roads are being built by Chinese firms when the jobs should have gone to Americans. Could this possible be true?” The answer: Yes, it’s true. End of story, right? Wrong. Days later, emails started to appear in our inbox that claimed ABC News reported that Chinese firm were receiving stimulus funds to build U.S. bridges — even though the broadcast news story didn’t mention stimulus funds at all. (The report did include a clip of Obama delivering a speech on the need to rebuild America’s bridges and put Americans to work, but said nothing about the president’s $830 billion stimulus bill.) Still, we received emails such as this one on Nov. 4, 2011, that included this erroneous claim language: “Stimulus money meant to create U.S. jobs went to Chinese firms. Unbelievable….” **It didn’t take long for Obama to be blamed**. That same day — Nov. 4, 2011 — we received an email that made this leap to Obama: “SOME CHINESE COMPANIES WHO ARE BUILDING ‘OUR’ BRIDGES. (3000 JOBS LOST TO THE CHINESE FIRM)…..AND NOW OBAMA WANTS ‘MORE STIMULUS MONEY’…..THIS IS NUTS ! ! ! If this doesn’t make you furious nothing will….” This year, Obama’s name started to surface in the subject line of such critical emails — raising the attack on the president to yet another level and perhaps ensuring the email will be even more widely circulated. Since Jan. 17, we have gotten more than a dozen emails with the subject line, “ABC News on Obama/USA Infrastructure,” often preceded with the word “SHOCKING” in all caps. The emails increasingly contain harsh language about the president. Since Jan. 11, 23 emails carried this added bit of Obama-bashing: “I pray all the unemployed see this and cast their votes accordingly in 2012!” One of those emails — a more recent one from Feb. 8 — contained this additional line: “Tell me again how Obama’s looking out for blue collar guys**. He** cancels pipelines, and **lets Chinese contractors build our bridges…” And so it goes, on and on. All from a news report that blamed state officials — not Obama — for spending taxpayer money** on Chinese firms to build U.S. bridges.

**US federal nuclear leadership is key to science diplomacy**

**AAAS ‘8** ((American Association for the Advancement of Science, 10 July 2008, “Energy Expert Calls on United States to Take Leadership in Nuclear Energy Framework”, <http://www.aaas.org/news/releases/2008/0710nuclear_energy.shtml>, [Miller])

**The** next U.S. **president will have a historic opportunity to exercise leadership in** increasing the global investment in **nuclear** technology**, energy expert Victor Reis said** at a AAAS briefing. But the stakes are higher than just finding an alternative to the rising price of oil and coal. Reis, a senior advisor to Secretary of Energy Samuel W. Bodman, said that a well-designed nuclear energy framework could drive global growth by bringing affordable, reliable energy to the developing world, address climate change through clean energy production, and promote international security by securing nuclear materials around the world. **"By increasing the civilian nuclear enterprise, the** next U.S. **president can make use of a historic opportunity to simultaneously attack the biggest interlocking issues that society will face for the next 50 years**," said Reis. Speaking at AAAS headquarters in Washington, D.C., Reis said that around 1.6 billion people, or 25% of the world's population, live without access to electricity and 2.4 billion, or 35%, rely on traditional, carbon-rich biomass like wood for their energy needs because they have no access to modern fuels. Because experts have found a strong correlation between electricity use and almost every statistic for quality of life including life expectancy, literacy, education, and gross domestic product per capita, Reis said, it is imperative that developed nations bring power to the world's neediest citizens. In addition to being an effective technology to meet the future energy needs of the developing world, Reis said that nuclear power generation is better for the environment because it does not release carbon dioxide into the atmosphere. In order to meet a conservative target of maintaining atmospheric carbon dioxide levels below 550 parts per million—a goal echoed in a 2008 report by the Intergovernmental Panel on Climate Change—while still fulfilling the world's energy needs, Reis says that governments must invest heavily in nuclear technology. "A lot of people around the world don't have access to electricity, and you don't want them to burn carbon-rich sources like coal," said Reis, adding that he doesn't see "how you can realistically address climate change without nuclear power." Reis said he is encouraged that many politicians, including those running for president, recognize climate change as among the most pressing issues for their first term in office. Sponsored by the AAAS Center for Science, Technology, and Security Policy, the 2 June briefing on nuclear energy brought together scientists, policy makers, students, and the media. At the event, Benn Tannenbaum, the Center's associate program director, said that he has noticed an increasing amount of opinion and commentary articles on nuclear technology in the nation's largest newspapers, suggesting that it is becoming a heavily discussed issue. "Nuclear energy has tremendous implications for the coming century," said Tannenbaum. "It's absolutely that vital that policy makers make informed decisions with the help of scientists to determine if and how nuclear energy programs move forward. The stakes are incredibly high." Reis said that regardless of U.S. domestic plans to increase nuclear energy production, a widespread global initiative to generate electricity using nuclear power is already underway. Around the world, there are already 439 nuclear reactors in 31 countries, representing 16% of the world's total electricity production. In the United States alone, there are 104 reactors representing 20% of domestic electricity production. Reis added that there are around 93 nuclear power-generating facilities on order or planned globally. He pointed out, however, that there are many challenges to increasing nuclear power around the world, most notably ensuring that radioactive materials used in nuclear power production are not obtained by terrorists or rogue states. One controversial solution announced in 2006 by the administration of U.S. President George W. Bush is the Global Nuclear Energy Partnership (GNEP), an international agreement that has been signed by 21 nations including the United States, the United Kingdom, Russia, China, and France. Under GNEP, the United States and other nations with advanced civilian nuclear energy production facilities would be responsible for safely reprocessing spent nuclear fuel from energy production and then would export it to be reused for other nations' energy programs. This would reduce the number of nuclear enrichment and reprocessing sites around the world, Reis said. He said that the Reliable Replacement Warhead (RRW) program, announced by Bush in 2004, would also help to significantly reduce the overall number of weapons in the U.S. nuclear arsenal while modernizing their design. Weapons experts believe that this may encourage other nations including Russia to reduce their stockpiles. While some experts like former Secretaries of State George P. Shultz and Henry A. Kissinger suggest that nations should aim to achieve a nuclear weapons-free world, others such as former Secretary of Defense Harold Brown and former Director of Central Intelligence John Deutch believe that it is an unreasonable goal and poor policy. Beyond the proliferation of enriched nuclear material, many critics of nuclear power production in the United States fear the increased amount of toxic materials that need to be transported from the reactors to storage after they are used. Reis said he understood those concerns but pointed to the 100 million miles of safe travel that the Department of Energy has overseen for the nation's nuclear weapons and energy materials. He said the same procedures can be applied to commercial nuclear energy. In addition, many nuclear power critics fear the consequences of reactor accidents like the 1986 Chernobyl accident in the Soviet Union and the 1979 Three Mile Island accident near Harrisburg, Pennsylvania. Reis once again pointed out the globe's "remarkable" safety record during more than 12,000 reactor-years of operation with significant improvements made to world's nuclear infrastructure following the incidents. The Three Mile Island incident caused no documented injuries and led to important improvements in U.S. and global safety operations, he said. He added that the Chernobyl disaster involved a reactor that was poorly designed and did not have sufficient containment, which lead to a new generation of reactors with higher safety specifications. Another significant issue with nuclear energy production is where to store the radioactive materials. One controversial proposal is to transport all waste to the Yucca Mountain Repository, a geological storage facility1000 feet deep in the Nevada desert. While the plan has its advantages, such as the ability to retrieve the materials after they are deposited, Reis said that many find the program "geographically unfair" because it makes one region assume the entire burden of the nation's nuclear waste. Regardless of the decision to increase nuclear energy production over the coming decades, Reis said that the Department of Energy (DOE) is able and ready to meet the new challenges of the 21st Century. With over 12,440 Ph.D. scientists, 25,000 visiting scientists, and 17 laboratories across the country, Reis said that **the DOE laboratories "represent one of the biggest scientific collections in the world [and] maybe in the history of civilization."** Beyond access to some of the **top scientific minds and computers** in the world, Reis highlighted several major DOE achievements including **maintaining six top research facilities**, certifying the U.S. nuclear weapons arsenal without underground testing, **helping other nations** secure their nuclear materials, and cleaning up the Rocky Flats weapons production facility and helping convert it into a wildlife refuge. In addition, Reis said that the DOE has nine years of successful operation of its Waste Isolation Pilot Plant (WIPP). Located in Carlsbad, New Mexico, the facility is an underground radioactive waste repository serving as a frontrunner for the Yucca Mountain site. "**Because of the implications of nuclear energy, good or bad, it is important that the** next **administration seize the opportunity for global leadership by using the Department of Energy's world leading assets**," Reis said. Reis added that **the nuclear enterprise could become a vehicle for international cooperation**, echoing a December 1953 speech by U.S. President Dwight D. Eisenhower in which he pledged to devote the nation's "entire heart and mind to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life."

**Science diplomacy accesses every impact**

**Fedoroff ‘8** (Nina, Science and Technology Advisor to the Secretary of State, “Making Science Diplomacy more Effective”, Testimony before the House Science Subcommittee on Research and Science Education, 4-2, <http://legislative.nasa.gov/hearings/4-2-08%20Fedoroff.pdf>)

**Science by its nature facilitates diplomacy because it strengthens political relationships, embodies powerful ideals, and creates opportunities** for all. The global scientific community embraces principles Americans cherish: transparency, meritocracy, accountability, the objective evaluation of evidence, and broad and frequently democratic participation. Science is inherently democratic, respecting evidence and truth above all. Science is also a common global language, able to bridge deep political and religious divides. Scientists share a common language. Scientific interactions serve to keep open lines of communication and **cultural understanding**. As scientists everywhere have a common evidentiary external reference system, members of ideologically divergent societies can use the common language of science to cooperatively address both domestic and the increasingly trans-national and global problems confronting humanity in the 21st century. There is a growing recognition that science and technology will increasingly drive the successful economies of the 21st century. Science and technology provide an immeasurable benefit to the U.S. by bringing scientists and students here, especially from developing countries, where they see democracy in action, make friends in the international scientific community, become familiar with American technology, and contribute to the U.S. and global economy. For example, in 2005, over 50% of physical science and engineering graduate students and postdoctoral researchers trained in the U.S. have been foreign nationals. Moreover, many foreign-born scientists who were educated and have worked in the U.S. eventually progress in their careers to hold influential positions in ministries and institutions both in this country and in their home countries. They also contribute to U.S. scientific and technologic development: According to the National Science Board`s 2008 Science and Engineering Indicators, 47% of full-time doctoral science and engineering faculty in U.S. research institutions were foreign-born. Finally, some types of science - particularly those that address the grand challenges in science and technology - are inherently international in scope and collaborative by necessity. The ITER Project, an international fusion research and development collaboration, is a product of the thaw in superpower relations between Soviet President Mikhail Gorbachev and U.S. President Ronald Reagan. This reactor will harness the power of nuclear fusion as a possible new and viable energy source by bringing a star to earth. ITER serves as a symbol of international scientific cooperation among key scientific leaders in the developed and developing world - Japan, Korea, China, E.U., India, Russia, and United States - representing 70% of the world`s current population. The recent elimination of funding for FY08 U.S. contributions to the ITER project comes at an inopportune time as the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project had entered into force only on October 2007. The elimination of the promised U.S. contribution drew our allies to question our commitment and credibility in international cooperative ventures. More problematically, it jeopardizes a platform for reaffirming U.S. relations with key states. It should be noted that even at the height of the cold war, the United States used science diplomacy as a means to maintain communications and avoid misunderstanding between the world`s two nuclear powers - the Soviet Union and the United States. In a complex multi-polar world, relations are more challenging, the threats perhaps greater, and the need for engagement more paramount. Using Science Diplomacy to Achieve National Security Objectives The welfare and stability of countries and regions in many parts of the globe require[s] a concerted effort by the developed world to address the causal factors that render countries fragile and cause states to fail. Countries that are unable to defend their people against starvation, or fail to provide economic opportunity, are susceptible to extremist ideologies, autocratic rule, and abuses of human rights. As well, the world faces common threats, among them **climate change, energy and water shortages, public health emergencies, environmental degradation, poverty, food insecurity, and religious extremism**. These threats can undermine the national security of the United States, both directly and indirectly. Many are blind to political boundaries, **becoming regional or global threats**. The United States has no monopoly on knowledge in a globalizing world and the scientific challenges **facing humankind** are enormous. Addressing these common challenges demands common solutions and necessitates **scientific cooperation**, common standards, and common goals. We must increasingly harness the power of American ingenuity in science and technology through strong partnerships with the science community in both academia and the private sector, in the U.S. and abroad among our allies, to advance U.S. interests in foreign policy. There are also important challenges to the ability of states to supply their populations with sufficient food. The still-growing human population, rising affluence in emerging economies, and other factors have combined to create unprecedented pressures on global prices of staples such as edible oils and grains. Encouraging and promoting the use of contemporary molecular techniques in crop improvement is an essential goal for US science diplomacy. An essential part of the war on terrorism is a war of ideas. The creation of economic opportunity can do much more to combat the rise of fanaticism than can any weapon. The war of ideas is a war about rationalism as opposed to irrationalism. Science and technology put us firmly on the side of rationalism by providing ideas and opportunities that improve people`s lives. We may use the recognition and the goodwill that science still generates for the United States to achieve our diplomatic and developmental goals. Additionally, the Department continues to use science as a means to reduce the proliferation of the weapons` of mass destruction and prevent what has been dubbed `brain drain`. Through cooperative threat reduction activities, former weapons scientists redirect their skills to participate in peaceful, collaborative international research in a large variety of scientific fields. In addition, new global efforts focus on improving **biological**, chemical, and **nuclear security** by promoting and implementing **best scientific practices as a means to enhance security, increase global partnerships, and create sustainability.**

## 1ar

### Solvency

#### Manufacturing capability will develop as the industry expands.

Howard, ‘7

[Angie, Vice President -- NEI, 2-15, “Achieving Excellence in Human Performance: Nuclear Energy Training and Education,” http://nei.org/newsandevents/speechesandtestimony/2007/americannuclearsociety/]

Finally, we are seeing the first signs of revival in the supply chain for new nuclear plant construction. In manufacturing, for instance, Babcock & Wilcox recently renewed its federal accreditation for manufacturing nuclear-grade components. And there is manufacturing capability overseas in Japan and France. U.S. nuclear companies have already placed orders with Japanese companies for long-lead, heavy-forgings for reactor components. The supply chain will respond as market demand dictates. The more it looks like new nuclear plants will be built, the more U.S. capability will be developed. Today, 14 companies and consortia have announced that they are preparing to submit license applications to the Nuclear Regulatory Commission to build up to 32 new reactors. These companies are selecting technologies from two NRC-certified reactor designs, and two more designs that are under review by the NRC. These application submittals are expected beginning in 2007. Every major nuclear fleet operator is involved in some way, as well as some newcomers to the industry. Different companies are moving at different speeds, but the momentum is real.

#### Industry training efforts solve.

Flint, ‘8

[Alex, Senior Vice President -- Governmental Affairs, Nuclear Energy Institute, 3-12, “Speech to the Select Committee on Energy Independence and Global Warming,” http://nei.org/newsandevents/speechesandtestimony/2008\_speeches\_and\_testimony/march\_12\_2008\_written\_testimony]

Training of skilled technicians and craft personnel — such as operators, technicians, electricians, welders, pipe-fitters and other maintenance workers—is essential to sustain the highly qualified work force needed to continue efficient, reliable electricity production. To attract workers to skilled craft careers and provide appropriate training and education, the industry has participated in the formation of 10 state-based consortia and other collaborative arrangements among state governments, industry and academia. In the areas of radiation protection, operations, and maintenance, 17 industry-community college collaborative training programs have been launched in 14 states, most within the past three years, to bring younger workers into these fields. The industry also is working with organized labor to develop training and other programs to provide the cadre of highly skilled workers that our future requires.  NEI supports the application of federal prevailing wage requirements, contained in the Davis-Bacon Act of 1931 as amended, to loan guarantees authorized by Title XVII of the Energy Policy Act of 2005.

### AT: Cost-Competitiveness

#### Government subsidization solves

**Blees et al 11** (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/

Economics¶ The economics of nuclear power in the public debate has only the most tenuous connection with reality in many cases. Consider the example of the AP-1000 reactors currently being built in China. Even the first-of-a-kind plants (FOAK)—normally overly expensive compared to later ones for obvious reasons—that are well along in their construction are expected to be completed at a cost of about $1,760/kW [xiv]. China expects that once their supply chains are in place to mass-produce such plants, they will be able to produce them for $1,100/kW or less [xv]. Yet even when the exact same reactor is planned for construction in the United States, the price escalates to three times the Chinese cost or more, as when Florida Power & Light testified before the Florida Public Service Commission on October 16, 2007 about their planned construction of two AP-1000s [xvi].¶ It is in this collision of actual data vs. cost projections that we find ourselves when attempting to credibly determine the costs of building commercial-scale IFRs. In Senate testimony in late 2006, GE estimated the building cost of the S-PRISM reactor at just $1,300/kW [xvii]. China’s current project and Japan’s construction of the first two GE-designed Advanced Boiling Water Reactors (ABWR) in the Nineties (built in only 36 and 39 months)[xviii]demonstrate the cost advantages of standardization and modular construction that will be a hallmark of PRISM reactors. Based on the ABWR experience, GE estimated in 2000 that they would be able to build ABWRs in the USA for as little as $1,200/kW (if regulatory and other risk-inflation problems could be resolved) [xix]. Considering that the PRISM will operate at near-atmospheric pressures, obviating the costly fabrication of a pressure vessel, and employ cost-saving passive safety design concepts (and ultimately factory-built mass production), simple logic and manufacturing experience would indicate that IFR construction can be expected to be economically competitive with virtually any other power production system. Even if GE’s 2006 estimate were doubled, the cost would still make it competitive, especially considering that the fuel to run it for many decades would be essentially free except for its fabrication costs, which we’ve already seen will be quite low due to the simplicity of pyroprocessing.¶ When it comes to the economics of nuclear power, experience of the last couple of decades has shown that there is nothing inherently cost prohibitive about nuclear power per se. While some will argue that China can build power plants inexpensively because of cheap labor, that argument is proven hollow by Japan’s modest construction costs for the first two ABWRs, since Japan imports virtually all their construction materials and Japanese workers are among some of the highest-paid in the world. If nuclear power plants cost 4-5 times as much in the USA as the same plant costs in the Far East, it’s the fault of American politics and economics, not the fault of the technology. With the construction of natural gas-fired power plants recently moving past the $1,000/kW range, the substantial added cost of the fuel needed to run them during the course of their service lives (already over 40-60% of the levelized cost of gas-fired electricity) makes nuclear power look like a bargain by any reasonable analysis, even before the introduction of a carbon tax [xx].

### AT: Natural Gas

#### Gas supply crunch coming now – shale production ceilings and economics

Nelder, 12 [Chris, Smart Planet, February, Everything you know about shale gas is wrong, <http://www.smartplanet.com/blog/energy-futurist/everything-you-know-about-shale-gas-is-wrong/341>]

But now there’s even more bad news: U.S. gas production appears to have hit a production ceiling, and is actually declining in major areas. The startling revelation comes from a new [paper](http://www.theoildrum.com/node/8914) published today by Houston-based petroleum geologist and energy sector consultant Arthur Berman. Berman reached this conclusion by compiling his own production history of U.S. shale gas from a massive data set licensed from data provider HPDI. His well-by-well analysis found that total U.S. gas production has been on an “undulating plateau” since the beginning of 2009, and showed declines in some areas in 2011. This stands in stark contrast to recent data provided by the EIA, which shows shale gas production rising steadily for the past two years, and well into the future. The EIA’s forecast is bullish because it’s mainly a view of demand, without great regard for supply limits. But their historical supply data differs for a reason that will be no surprise to experienced observers: the data is bad. The EIA gets its data on shale gas production by sampling the reports of major operators, then applying a formula to estimate how much gas is actually being produced, according to Berman. This may explain why they only have official monthly historical production data for the [two years](http://www.eia.gov/dnav/ng/hist/ngm_epg0_fgs_nus_mmcfm.htm) (unofficially, [three](http://www.eia.gov/dnav/ng/ng_prod_shalegas_s1_a.htm)) of 2008 and 2009, and only annual data for 2010 and 2011. This has been a big red flag to me in my recent work on shale gas, accustomed as I am to EIA’s far more detailed and up-to-date monthly and weekly data on oil, and has made it nearly impossible to verify the claim that we’ve had “booming” gas production over the past two years. Data is also available directly from the states, but some states haveflawed reporting processes**,** the granularity and reporting frequency varies (as low as every six months, in the case of Pennsylvania), and ultimately the data isn’t available in a usable format. It’s also inaccurate and incomplete, as one Pittsburgh newspaper recently [found out](http://www.post-gazette.com/pg/12008/1202172-503-0.stm). Berman reached the same conclusion, noting in his paper that “the data that EIA makes available does not have sufficient resolution to evaluate individual plays or states.” So he had to build his own database. An unprofitable treadmill One reason for the recent slowdown in production growth is that “unconventional” shale gas wells have to make up for the decline of conventional gas wells, which has accelerated from 23 percent per year in 2001 to 32 percent per year today. The U.S. now needs to replace 22 billion cubic feet per day (Bcf/d) of production each year just to maintain flat supply. Currently, all shale gas plays together produce around 19 Bcf/d. The shift to unconventional gas has put us on a production treadmill: We have to keep drilling like mad to maintain output because unconventional wells are far less productive and shorter-lived than conventional gas wells. Berman observes that an average gas well in Texas in 2010 produces one-fifth as much gas as an average conventional gas well did in 1972. In 1972, 23,000 gas wells produced 7.5 trillion cubic feet in Texas; in 2010, it took 102,000 wells to produce 6.4 trillion cubic feet. Another reason was that the spurt of production created a gas glut and drove prices far below the level of profitability. Data from a January, 2012 [presentation](http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NDUxNzk4fENoaWxkSUQ9NDc2OTUwfFR5cGU9MQ==&t=1) by the CEO of gas operator Range Resources showed that gas needs to sell for at least $4 per million BTU in order for operators to turn a profit. Source: Jonathan Callahan, [The Oil Drum](http://www.theoildrum.com/node/8900). Data from Range Resources. Berman is certain that the $4 threshold applies to new drilling on existing plays only; after accounting for land leasing, overhead and debt service, the threshold would be much higher. In any case, we can see that production flattened out when prices fell below $4 at the beginning of 2009. Source: Arthur Berman. Data from Natural Gas Intelligence. A gas price below $3 spells real trouble for operators, and flagging production is but the first effect. The next is debt: According to analysis by ARC Financial Research, the 34 top U.S. publicly traded shale gas producers are currently carrying a combined $10 billion quarterly cash flow deficit. And finally, there will the destruction of forward supply, as new development grinds down. Financing further development with debt in this environment will be extremely difficult, and eventually even the joint-venture sugar daddies that have sustained operators over the past few months will get cold feet. Without a reversal in price, gas production is guaranteed to decline. The gas gold rush is over Indeed, Berman concludes that “the gold rush is over at least for now with the less commercial shale plays.” Within the major producing areas of the U.S., which account for 75 percent of production, all except Louisiana have been either flat or declining in recent years. Overall, he sees evidence that 80 percent of existing U.S. shale gas plays are already approaching peak production. Rig counts have been falling, and major operators such as Chesapeake Energy and ConocoPhilips have announced slowdowns in drilling in the last month. The two major plays that do not show evidence of peaking yet are the newer ones: the Marcellus Shale in Pennsylvania and the Haynesville Shale in Louisiana. To see the influence of these two plays on overall production, compare the first chart below, which shows production from all shale plays, to the second, which removes production from those two plays: Source: Arthur Berman Source: Chart by Chris Nelder, from Arthur Berman’s worksheets The Haynesville surpassed the Barnett Shale in Texas last year as the top-producing shale play in the U.S., but it may be reaching a production plateau now. Worse, Berman’s analysis finds that despite its impressive production, the Haynesville is among the least economic of the shale plays, requiring gas prices above $7.00 per thousand cubic feet to sustain new drilling profitably, and nearly $9.00 per thousand cubic feet after accounting for leasing and other costs. (One thousand cubic feet is roughly equivalent to one million BTU.) A word of caution is in order here: A one-year decline in production in an unprofitable environment is not proof that shale gas has “peaked.” It’s certainly possible that renewed drilling could bring higher production when gas prices rise again. The operative question in that case is when. If gas prices recover within the next year or two, it will be relatively easy to bring new wells online rapidly. But if gas prices languish for longer than that, the most productive “core” areas of the plays could become exhausted because the wells deplete so quickly. Without sustained new drilling to replace their production, by the time producers begin drilling again in the remaining, less productive prospects, an air pocket could form in the supply line. Disinformation and diffusion theory Berman admits that it’s strange for his bottom-up analysis to produce results that are so wildly divergent from the claims of the operators and the data offered by the EIA. “I ask myself: Where could we be wrong?” he explained. “We’ve looked at the individual wells and it looks like they’ll produce less gas than the operators say, so where could we be wrong? Likewise on cost: There are no retained earnings, so how could they be saying they’re profitable?” Having scrutinized the financial reports of operators, Berman concludes that operators are being honest with the SEC, because if they aren’t, somebody will go to jail. But then they’re telling a very different story to the public, and to investors, particularly regarding their costs. This isn’t necessarily nefarious; it’s really just a way of working around the natural risks associated with new resource development. They’re playing for the future, not for immediate profitability. Early wildcatters gambled on debt-fueled drilling with the hope that they’d be able to hold the leases long enough to see prices rise again and put them nicely in the black, or flip them at a profit to someone who could. And the profit picture is substantial: according to the Range Resources presentation, when gas is $6, they’ll be realizing a 135 percent internal rate of return. “I think these companies realize—clearly—that the U.S. is moving toward a gas economy,” Berman observes. “The natural gas industry has been very successful at screwing up the coal industry. . . a huge part of the demand is from the power generation business. The President now thinks, incorrectly, that we’ve got 100 years of natural gas. [Op’erators think] ‘If we can just get all this land held, drilled, etc., then in a couple of years when the price recovers we’re going to make a fortune’. . . and they’re right!” I am inclined to agree. My own analysis suggests that [gas is trouncing coal](http://www.smartplanet.com/blog/energy-futurist/regulation-and-the-decline-of-coal-power/275) in the power generation sector. I am also strongly [against exporting LNG](http://www.smartplanet.com/blog/energy-futurist/the-siren-song-of-lng-exports/313), because it will increase domestic costs across the board, another point on which Berman and I agree. “If they go through with the permits to export LNG, then that’s gonna seal it,” he remarked. “All you have to do is commit to 20-year contracts to ship a few bcf per day. . . I fear what’s really going to happen is that we’re going to have to start importing LNG.” Ultimately, we have to ask why there seems to be such an enormous disconnect between the reality of the production and reserve data, and the wild-eyed claims of operators and politicians. Berman’s answer is blunt: “We’re in a weird place where it’s not in anybody’s vested interest to say that things aren’t wonderful,” he said, and went on to relate a few stories of his encounters with politicians. They admitted to him, straight-up, that they can’t tell the public the truth about energy issues like gas reserves and peak oil because nobody wants to hear it, and they’ll just wind up getting voted out of office. “This gets back to basic diffusion theory,” Berman muses, “where only 5 percent of people base their decisions on information, while the other 95 percent make decisions on what everybody else thinks.” That sounds right to me. It benefits everyone involved to tell happy lies, and benefits no one to own up to the current reality. That is true for everyone from the operators right on up to the President. Perhaps in the end—like government—we’ll simply get the energy policy we deserve.

### Aging Crisis

#### Theories of Aging hurting stability or the economy are inaccurate-multiple reasons\*\*

**Bloom et al 2009**(David E. Bloom, David Canning, and Günther Fink, The Graying of Global Population and Its Macroeconomic Consequences, Department of Global Health and Population Harvard School of Public Health, October 2009, <http://www.cardi.ie/userfiles/The%20Graying%20of%20Global%20Population.pdf>)

One question that naturally emerges from the large observed shifts in age structure concerns the effects of population aging on nations’ economic performance. Many studies, such as the Peterson analysis mentioned in the introduction, suggest that population aging will diminish the productive capacities of nations. In general, these studies highlight the importance of labor and capital to the production of output and the creation of value. Their central contention is that there are strong life-cycle patterns related to work and saving. Since senior citizens do not work and save as much as younger adults, these studies predict that population aging will have a large negative effect on economic growth. Although the logic of this argument is sound, the narrow scope chosen in this type of study causes them to overstate the magnitude of the economic burden associated with population aging. This is so for two reasons: first, the exclusive focus on the elderly completely neglects other important differences in the age structure that are highly relevant for economic growth and development. Second, most existing studies assume individuals’ behavior to be constant and thus fail to consider a host of behavioral and policy adjustments that will naturally occur in response to population aging. Taking account of these two points leads to a significantly more positive economic outlook for an aging world. One key factor for economic growth is the relative and absolute size of the labor force. The global labor force participation rate (i.e., the total labor force divided by the population aged 15 and over) is projected to fall 4.3 percentage points from 2000 to 2040, from 66.4 to 62.1.3 Some scholars find this predicted change alarming. However, from a broader perspective, this decline represents less than half of a standard deviation in the cross-country distribution of the labor force participation rate for 2000. Moreover, a second accounting indicator provides a very different picture. The size of the labor force, when expressed as a ratio to total population(instead of to the population aged 15 and over), will actually increase, from 46.5 percent to 48.6 percent (Bloom, Canning, and Fink 2009). This change is due to falling fertility in developing countries. In other words, the increase in elderly dependents will be more than offset by a decline in youth dependents. This offset suggests that population aging does not pose an imminent economic crisis for the world. It is more accurately viewed as, at most, a modest issue for particular economies (such as the OECD). This basic point – that despite an increasingly elderly population, the labor force is likely to be a larger share of the total population – is one reason to not be too pessimistic about the effects of population aging. Behavioral change and institutional adaptation are two more reasons for viewing population aging as a manageable phenomenon from an economic perspective. **Aging populations generally are associated with increased labor force participation of women, increased human capital accumulation among the young, and increased savings.** These behavioral responses may be even stronger when supported by childcare, retirement, and immigration policies that allow for desirable adjustments in the labor market. Declining fertility has led to, and will continue to lead to, greater female labor force participation. Bloom and colleagues analyze data **for 97 countries** during 1960 to 2000 and show that for every unit reduction in fertility, women tend to work two years more over their lives(Bloom, Canning, Fink, and Finlay, 2009). 4 Based on UN fertility assumptions for 2040, this translates into a 3 percentage point boost in the female labor force participation rate. Second, fewer children generally mean healthier, smarter, and better-educated children as parents divide their resources among fewer offspring. Insofar as health, cognition, and education translate into higher adult productivity, lower fertility rates thus induce a further boost to economic growth (Bloom and Canning, 2000). Third, demographic projections indicate further gains in longevity, as discussed above, including most probably gains in years of healthy life. In addition to the increases in private welfare, increased longevity is also expected to provide a boost to savings rates as people accumulate more capital in expectation of longer future periods of retirement (Bloom, Canning, and Graham, 2003). In economic terms, savings translates into investment, which in turn fuels the accumulation of physical and human capital and technological progress, which drive economic growth.

#### Decrease in expenditures in the young and middle populations will counterbalance the increase in expenditures from the elderly

**LaPierre and Hughes 2009**-  Department of Sociology and the Gerontology Center University of Kansas (Tracey and Mary Elizabeth,  Population Aging in Canada and the United States, pg 222-23, International handbook of population aging by Peter Uhlenberg)

The rhetoric of an aging population crisis tends to focus only on the areas where government expenditures will increase as a result of increases in the proportion of the population that is elderly. As we have reviewed, in both nations government spending in certain areas will have to increase in order to maintain publicly funded benefits at the levels that today’s seniors enjoy. However, this narrow view of the consequences of a changing age structure misses the bigger picture and overestimates the net costs of population aging because it fails to consider that, while expenditures for the oldest segment of society will increase, expenditures for the youngest and middle age groups will decrease. These decreases will to some extent counterbalance the increases associated with the elderly (Denton and Spencer 2000). Henripin (1994) however, is less optimistic about the degree to which the reduction in expenditures on younger age groups will compensate for the large increases in public health costs and pension benefits for older adults. Reductions in expenditures for the youngest and middle age groups will not result from robbing resources from the young to care for the old. Instead, these reductions reflect the fact that these age groups represent a smaller proportion of the population than previously and will therefore claim a smaller proportion of government budgets, even while per capita spending for these age groups is maintained. Areas of government expenditure that will likely see relative decreases as a result of smaller proportions of young and middle-age groups include education, employment programs (e.g., unemployment insurance and worker’s compensation) and correctional services (Denton and Spencer 2000). This is truer for Canada than the U.S., as Canada currently has a lower fertility rate than the U.S. and has more social spending geared towards younger age groups, such as family allowances, child tax credits and child-care subsidies. Even so, based on empirical studies to date, the real issue for both governments does not appear to be how to deal  with a demand for a larger overall budget but how to rearrange money across various types of expenditures in relation to increased demand in some areas and a reduction in others (Denton and Spencer 2000). To the extent that this is not the case, Canadians and Americans will have to make some important decisions regarding how much they value the support provided to older adults and how much they are willing to pay as a society to maintain it.

### Uniqueness/Watered Down

#### No comprehensive White house strategy and history proves – CIR won’t pass

**Munro 12-31** – Neil, the Daily Caller contributor(Obama promises new immigration plan but keeps endgame close to his vest, The Daily Caller, http://dailycaller.com/2012/12/31/obama-promises-new-immigration-plan-but-keeps-endgame-close-to-his-vest/3/)

President Barack Obama promised Dec. 30 to introduce an immigration bill during 2013, but activists on all sides of the debate are trying to understand his strategy.

He may be gunning for a victory in the mid-term elections by introducing a bill so radical that it will spark an emotional controversy from whites, which would then spur many angry Latinos to vote Democratic in the 2014 midterm elections, said Robert de Posada, former head of a GOP-affiliated group, The Latino Coalition.

“The word that I’ve heard from many, is [that he will] submit a very, very liberal plan that most Republicans will not support, that most southern and moderate Democrats will not support,” he said.

When the bill fails, “they can announce once again that they tried [and that Latinos] need to rally in the next election,” said Posada, who helped President George W. Bush win 40 percent of the Latino vote in 2004, during the housing boom.

But that strategy would break Obama’s election-trail promise to help Latinos, said one Hill staffer who is working to pass an ambitious bill that would eventually provide citizenship to millions of Democratic-leaning, low-skill Latinos and their extended relations.

However, he noted, Obama hasn’t met with Democratic Illinois Rep. Luis Gutierrez, the leading Capitol Hill advocate for amnesty for illegal immigrants, since November.

“We don’t quite know what the White House is doing,” he said.

Obama sketched his 2013 plans during a low-pressure interview on NBC’s “Meet the Press” Sunday.

“I’ve said that fixing our broken immigration system is a top priority,” he told interviewer David Gregory, who is now under police investigation for violating D.C. law by brandishing a 30-bullet magazine on his Dec. 23 show.

“I will introduce legislation in the first year to get that done,” Obama said.

“I think we have talked about it long enough. We know how we can fix it. We can do it in a comprehensive way that the American people support. That’s something we should get done.”

Gregory did not challenge any of Obama’s claims, nor did he question Obama about how his bill would impact the high unemployment rate among low-skilled Americans, especially African-Americans, in a an increasingly high-tech economy.

However, Obama’s language suggested that increased Latino immigration is a lower priority for him than other measures, and that he’s concerned any revamp would fail because of public opposition.

Many previous immigration reform bills have died when leading supporters quietly backed away amid furious public opposition to what was perceived as an attempt at a general amnesty. In 2007, then-Sen. Obama voted against a temporary-worker provision in a pending immigration bill, helping kill the overall legislation.

During his first term as president, Obama declined to push a comprehensive immigration bill, despite promising such a revamp while on the 2008 campaign trail.

In his NBC interview, Obama showed more enthusiasm about other priorities.

“We’ve got a huge opportunity around energy,” he said, “The most immediate thing I’ve got to do … is make sure that taxes are not going up on middle class families,” he claimed. Another priority, he added, is “rebuilding our infrastructure, which is broken.”

Obama also touted his new project to counter gun-violence. “Anybody who was up in Newtown, who talked to the parents, who talked to the families, understands that, you know, something fundamental in America has to change … you know, that was the worst day of my presidency,” he told Gregory.

“I will put forward a very specific [anti-violence] proposal based on the recommendations that Joe Biden’s task force is putting together as we speak,” he said.

De Posada argued that the House Speaker John Boehner should wait for Obama’s immigration bill before making a move on immigration. If it is too radical, he can force a vote and force Democratic legislators to vote for or against Obama’s bill.

During Bush’s term, for example, African-American Democrats kept a low profile on immigration, ensuring that the issue was not brought up for a vote in the House in 2007 and 2008.

“A bunch of Democrats are not going to be supportive,” de Posada predicted. That rejection would damage Obama’s standing among Latinos in the 2014 race, he said, and help GOP outreach.

De Posada said the GOP can win some sympathy among Latinos by pushing an ambitious bill that would welcome temporary migrant workers from across the United States’ southern border. In turn, that sympathy will ensure that Latinos actually listen to the GOP’s economic and social messages, he said.

However, various right-of-center immigration reformers are already trying to win passage of small-scale measures that don’t include a pathway to citizenship for illegal immigrants, or invitations to new migrant workers.

The small-scale bills can help American workers and high-tech employers, and also split the various ethnic, ideological and business groups now pushing for easier immigration, say the reform advocates.

A comprehensive bill “will not pass, just as it didn’t last time around [and if Obama] were actually serious, he would agree to a piecemeal approach where each piece could garner sufficient support to pass,” said Rosemary Jenks, director of government relations at NumbersUSA, an immigration-reform group.

Progressives such as Gutierrez oppose the small-scale measures, and instead seek to maximize the immigration of Democratic-leaning groups, including Hispanics.

In September, the right-of-center reformers pushed for a small-scale bill that would convert 50,000 so-called “Diversity Visas” into a program that would bring high-IQ tech experts into the country. That program does not currently consider potential immigrants’ skills, and instead awards visas to people from countries with few immigrants already in the United States.

However, Gutierrez and other progressives defeated the measure in a House vote. “If you support this bill, you are saying that one group of immigrants is better than another and one type of educated, degree-holding person and their work is more important than others,” Gutierrez declared Nov. 30.

“They are saying my father — and I resent it — my father was too stupid to make it, but he put two kids through college and one in the House of Representatives,” said Gutierrez, who chairs the immigration task force of the Congressional Hispanic Caucus.

Gutierrez is pushing Obama to propose an ambitious immigration overhaul, but he complained Dec. 20 on MSNBC that he has been excluded from White House planning.

#### Divergent strategies about immigration reform – your cards are too speculative (different approaches, no legal immigration, republicans won’t support amnesty)

**Grant 12-29** – David, CSM’s congressional correspondent in Washington, D.C., where he covers Capitol Hill (Is 'amnesty' a possibility for illegal immigrants now?, CSM, http://www.alaskadispatch.com/article/amnesty-possibility-illegal-immigrants-now)

But even while the parties broadly agree on the need to pursue immigration reform, how to do it remains up in the air.

Both Rubio and Labrador – like many Republicans – favor breaking up the immigration issue into smaller pieces.

Rubio argues that before Congress deals with the millions of undocumented immigrants, it must prove to the American people that it can secure US borders and establish an effective workplace-verification system. Labrador says he prefers a handful of bills moving simultaneously, with different coalitions able to support each measure.

Obama and Democrats in Congress favor a single comprehensive immigration bill, believing that taking one difficult but all-encompassing vote is more secure for lawmakers than having to vote for a half-dozen or more specific proposals.

"It's not a policy decision. It's a strategy decision, but it's an important one," says Representative Lofgren.

While Democrats and Republicans have been negotiating immigration reform for years, lawmakers also say it is vital that small groups of negotiators not hand down a fully formed bill to either chamber with, in effect, a "take it or leave it" sticker on top.

And while Republicans are on board now, there's a reason they've been hesitant to tackle immigration reform in the past. For one, a vocal part of their base views any form of citizenship for illegal immigrants as a repudiation of the rule of law. Whether these voters – or their representatives – can be persuaded to accept amnesty is an open question.

"We can negotiate about the DREAMers and things like that, but the vast, vast majority of the people who are here illegally – say 12 million people – I think they came here after the age of 18. They knowingly violated the law, and we have to have respect for our law," Labrador says.

Moreover, increasing legal immigration above the current level of 1 million annually could be seen as a blow to those born in America.

Hurting "the American worker with bad immigration policy is not going to get [Republicans] more Hispanic votes," says Roy Beck, executive director of Numbers USA, a group that advocates lower immigration levels. "They've got to do something else."

In that respect, increasing legal immigration might be a difficult sell in 2013.

"I do not see Congress acting in this area in a robust way until the labor market is stronger," says Andrew Schoenholtz, deputy director for the Institute for the Study of International Migration at Georgetown University. "Just how strong is hard to tell."

And then there are the questions that perhaps matter most in the Beltway: Whose plan is on the table first? Which party sets the initial terms for debate?

# Round 5 – Aff v Mary Wash MM

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### 1

#### Warming is real and anthropogenic – carbon dioxide increase, polar ice records, melting glaciers, sea level rise

**Prothero 12** [Donald R. Prothero, Professor of Geology at Occidental College and Lecturer in Geobiology at the California Institute of Technology, 3-1-2012, "How We Know Global Warming is Real and Human Caused," Skeptic, vol 17 no 2, EBSCO]

Converging Lines of Evidence¶ How do we know that global warming is real and primarily human caused? There are numerous lines of evidence that converge toward this conclusion.¶ 1. Carbon Dioxide Increase.¶ Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Little Ice Age in die 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, die timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil.¶ 2. Melting Polar Ice Caps.¶ The polar icecaps are thinning and breaking up at an alarming rate. In 2000, my former graduate advisor Malcolm McKenna was one of the first humans to fly over the North Pole in summer time and see no ice, just open water. The Arctic ice cap has been frozen solid for at least the past 3 million years (and maybe longer),4 but now the entire ice sheet is breaking up so fast that by 2030 (and possibly sooner) less than half of the Arctic will be ice covered in the summer.5 As one can see from watching the news, this is an ecological disaster for everything that lives up there, from the polar bears to the seals and walruses to the animals they feed upon, to the 4 million people whose world is melting beneath their feet. The Antarctic is thawing even faster. In February-March 2002, the Larsen B ice shelf - over 3000 square km (the size of Rhode Island) and 220 m (700 feet) thick- broke up in just a few months, a story typical of nearly all the ice shelves in Antarctica. The Larsen B shelf had survived all the previous ice ages and interglacial warming episodes over the past 3 million years, and even the warmest periods of the last 10,000 years- yet it and nearly all the other thick ice sheets on the Arctic, Greenland, and Antarctic are vanishing at a rate never before seen in geologic history.¶ 3. Melting Glaciers.¶ Glaciers are all retreating at the highest rates ever documented. Many of those glaciers, along with snow melt, especially in the Himalayas, Andes, Alps, and Sierras, provide most of the freshwater that the populations below the mountains depend upon - yet this fresh water supply is vanishing. Just think about the percentage of world's population in southern Asia (especially India) that depend on Himalayan snowmelt for their fresh water. The implications are staggering. The permafrost that once remained solidly frozen even in the summer has now Üiawed, damaging the Inuit villages on the Arctic coast and threatening all our pipelines to die North Slope of Alaska. This is catastrophic not only for life on the permafrost, but as it thaws, the permafrost releases huge amounts of greenhouse gases which are one of the major contributors to global warming. Not only is the ice vanishing, but we have seen record heat waves over and over again, killing thousands of people, as each year joins the list of the hottest years on record. (2010 just topped that list as the hottest year, surpassing the previous record in 2009, and we shall know about 2011 soon enough). Natural animal and plant populations are being devastated all over the globe as their environments change.6 Many animals respond by moving their ranges to formerly cold climates, so now places that once did not have to worry about disease-bearing mosquitoes are infested as the climate warms and allows them to breed further north.¶ 4. Sea Level Rise.¶ All that melted ice eventually ends up in the ocean, causing sea levels to rise, as it has many times in the geologic past. At present, the sea level is rising about 3-4 mm per year, more than ten times the rate of 0.10.2 mm/year that has occurred over the past 3000 years. Geological data show Üiat ttie sea level was virtually unchanged over the past 10,000 years since the present interglacial began. A few mm here or there doesn't impress people, until you consider that the rate is accelerating and that most scientists predict sea levels will rise 80-130 cm in just the next century. A sea level rise of 1.3 m (almost 4 feet) would drown many of the world's low-elevation cities, such as Venice and New Orleans, and low-lying countries such as the Netherlands or Bangladesh. A number of tiny island nations such as Vanuatu and the Maldives, which barely poke out above the ocean now, are already vanishing beneath the waves. Eventually their entire population will have to move someplace else.7 Even a small sea level rise might not drown all these areas, but they are much more vulnerable to the large waves of a storm surge (as happened with Hurricane Katrina), which could do much more damage than sea level rise alone. If sea level rose by 6 m (20 feet), most of die world's coastal plains and low-lying areas (such as the Louisiana bayous, Florida, and most of the world's river deltas) would be drowned.¶ Most of the world's population lives in lowelevation coastal cities such as New York, Boston, Philadelphia, Baltimore, Washington, D.C., Miami, and Shanghai. All of those cities would be partially or completely under water with such a sea level rise. If all the glacial ice caps melted completely (as they have several times before during past greenhouse episodes in the geologic past), sea level would rise by 65 m (215 feet)! The entire Mississippi Valley would flood, so you could dock an ocean liner in Cairo, Illinois. Such a sea level rise would drown nearly every coastal region under hundreds of feet of water, and inundate New York City, London and Paris. All that would remain would be the tall landmarks such as the Empire State Building, Big Ben, and the Eiffel Tower. You could tie your boats to these pinnacles, but the rest of these drowned cities would lie deep underwater.

#### Worst-case warming results in extinction

Ahmed 2010 (Nafeez Ahmed, Executive Director of the Institute for Policy Research and Development, professor of International Relations and globalization at Brunel University and the University of Sussex, Spring/Summer 2010, “Globalizing Insecurity: The Convergence of Interdependent Ecological, Energy, and Economic Crises,” Spotlight on Security, Volume 5, Issue 2, online)

Perhaps the most notorious indicator is anthropogenic global warmings warming. The landmark 2007 Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change (IPCC) – which warned that at then-current rates of increase of fossil fuel emissions, the earth’s global average temperature would likely rise by 6°C by the end of the 21st century creating a largely uninhabitable planet – was a wake-up call to the international community.[v] Despite the pretensions of ‘climate sceptics,’ the peer-reviewed scientific literature has continued to produce evidence that the IPCC’s original scenarios were wrong – not because they were too alarmist, but on the contrary, because they were far too conservative. According to a paper in the Proceedings of the National Academy of Sciences, current CO2 emissions are worse than all six scenarios contemplated by the IPCC. This implies that the IPCC’s worst-case six-degree scenario severely underestimates the most probable climate trajectory under current rates of emissions.[vi] It is often presumed that a 2°C rise in global average temperatures under an atmospheric concentration of greenhouse gasses at 400 parts per million (ppm) constitutes a safe upper limit – beyond which further global warming could trigger rapid and abrupt climate changes that, in turn, could tip the whole earth climate system into a process of irreversible, runaway warming.[vii] Unfortunately, we are already well past this limit, with the level of greenhouse gasses as of mid-2005 constituting 445 ppm.[viii] Worse still, cutting-edge scientific data suggests that the safe upper limit is in fact far lower. James Hansen, director of the NASA Goddard Institute for Space Studies, argues that the absolute upper limit for CO2 emissions is 350 ppm: “If the present overshoot of this target CO2 is not brief, there is a possibility of seeding irreversible catastrophic effects.”[ix] A wealth of scientific studies has attempted to explore the role of positive-feedback mechanisms between different climate sub-systems, the operation of which could intensify the warming process. Emissions beyond 350 ppm over decades are likely to lead to the total loss of Arctic sea-ice in the summer triggering magnified absorption of sun radiation, accelerating warming; the melting of Arctic permafrost triggering massive methane injections into the atmosphere, accelerating warming; the loss of half the Amazon rainforest triggering the momentous release of billions of tonnes of stored carbon, accelerating warming; and increased microbial activity in the earth’s soil leading to further huge releases of stored carbon, accelerating warming; to name just a few. Each of these feedback sub-systems alone is sufficient by itself to lead to irreversible, catastrophic effects that could tip the whole earth climate system over the edge.[x] Recent studies now estimate that the continuation of business-as-usual would lead to global warming of three to four degrees Celsius before 2060 with multiple irreversible, catastrophic impacts; and six, even as high as eight, degrees by the end of the century – a situation endangering the survival of all life on earth.[xi]

#### Warming causes extinction

**Sify 2010 –** Sydney newspaper citing Ove Hoegh-Guldberg, professor at University of Queensland and Director of the Global Change Institute, and John Bruno, associate professor of Marine Science at UNC (Sify News, “Could unbridled climate changes lead to human extinction?”, <http://www.sify.com/news/could-unbridled-climate-changes-lead-to-human-extinction-news-international-kgtrOhdaahc.html>, WEA)

The findings of the comprehensive report: 'The impact of climate change on the world's marine ecosystems' emerged from a synthesis of recent research on the world's oceans, carried out by two of the world's leading marine scientists. One of the authors of the report is Ove Hoegh-Guldberg, professor at The University of Queensland and the director of its Global Change Institute (GCI). 'We may see sudden, unexpected changes that have serious ramifications for the overall well-being of humans, including the capacity of the planet to support people. This is further evidence that we are well on the way to the next great extinction event,' says Hoegh-Guldberg. 'The findings have enormous implications for mankind, particularly if the trend continues. The earth's ocean, which produces half of the oxygen we breathe and absorbs 30 per cent of human-generated carbon dioxide, is equivalent to its heart and lungs. This study shows worrying signs of ill-health. It's as if the earth has been smoking two packs of cigarettes a day!,' he added. 'We are entering a period in which the ocean services upon which humanity depends are undergoing massive change and in some cases beginning to fail', he added. The 'fundamental and comprehensive' changes to marine life identified in the report include rapidly warming and acidifying oceans, changes in water circulation and expansion of dead zones within the ocean depths. These are driving major changes in marine ecosystems: less abundant coral reefs, sea grasses and mangroves (important fish nurseries); fewer, smaller fish; a breakdown in food chains; changes in the distribution of marine life; and more frequent diseases and pests among marine organisms. Study co-author John F Bruno, associate professor in marine science at The University of North Carolina, says greenhouse gas emissions are modifying many physical and geochemical aspects of the planet's oceans, in ways 'unprecedented in nearly a million years'. 'This is causing fundamental and comprehensive changes to the way marine ecosystems function,' Bruno warned, according to a GCI release. These findings were published in Science

#### The IFR is the only way to reduce coal emissions sufficiently to avert the worst climate disasters

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "Why We Should Build an Integral Fast Reactor Now," 11/25/9) http://skirsch.wordpress.com/2009/11/25/ifr/

To prevent a climate disaster, we must eliminate virtually all coal plant emissions worldwide in 25 years. The best way and, for all practical purposes, the only way to get all countries off of coal is not with coercion; it is to make them want to replace their coal burners by giving them a plug-compatible technology that is less expensive. The IFR can do this. It is plug-compatible with the burners in a coal plant (see Nuclear Power: Going Fast). No other technology can upgrade a coal plant so it is greenhouse gas free while reducing operating costs at the same time. In fact, no other technology can achieve either of these goals. The IFR can achieve both.¶ The bottom line is that without the IFR (or a yet-to-be-invented technology with similar ability to replace the coal burner with a cheaper alternative), it is unlikely that we’ll be able to keep CO2 under 450 ppm.¶ Today, the IFR is the only technology with the potential to displace the coal burner. That is why restarting the IFR is so critical and why Jim Hansen has listed it as one of the top five things we must do to avert a climate disaster.[4]¶ Without eliminating virtually all coal emissions by 2030, the sum total of all of our other climate mitigation efforts will be inconsequential. Hansen often refers to the near complete phase-out of carbon emissions from coal plants worldwide by 2030 as the sine qua non for climate stabilization (see for example, the top of page 6 in his August 4, 2008 trip report).¶ To stay under 450ppm, we would have to install about 13,000 GWe of new carbon-free power over the next 25 years. That number was calculated by Nathan Lewis of Caltech for the Atlantic, but others such as Saul Griffith have independently derived a very similar number and White House Science Advisor John Holdren used 5,600 GWe to 7,200 GWe in his presentation to the Energy Bar Association Annual Meeting on April 23, 2009. That means that if we want to save the planet, we must install more than 1 GWe per day of clean power every single day for the next 25 years. That is a very, very tough goal. It is equivalent to building one large nuclear reactor per day, or 1,500 huge wind turbines per day, or 80,000 37 foot diameter solar dishes covering 100 square miles every day, or some linear combination of these or other carbon free power generation technologies. Note that the required rate is actually higher than this because Hansen and Rajendra Pachauri, the chair of the IPCC, now both agree that 350ppm is a more realistic “not to exceed” number (and we’ve already exceeded it).¶ Today, we are nowhere close to that installation rate with renewables alone. For example, in 2008, the average power delivered by solar worldwide was only 2 GWe (which is to be distinguished from the peak solar capacity of 13.4GWe). That is why every renewable expert at the 2009 Aspen Institute Environment Forum agreed that nuclear must be part of the solution. Al Gore also acknowledges that nuclear must play an important role.¶ Nuclear has always been the world’s largest source of carbon free power. In the US, for example, even though we haven’t built a new nuclear plant in the US for 30 years, nuclear still supplies 70% of our clean power!¶ Nuclear can be installed very rapidly; much more rapidly than renewables. For example, about two thirds of the currently operating 440 reactors around the world came online during a 10 year period between 1980 and 1990. So our best chance of meeting the required installation of new power goal and saving the planet is with an aggressive nuclear program.¶ Unlike renewables, nuclear generates base load power, reliably, regardless of weather. Nuclear also uses very little land area. It does not require the installation of new power lines since it can be installed where the power is needed. However, even with a very aggressive plan involving nuclear, it will still be extremely difficult to install clean power fast enough.¶ Unfortunately, even in the US, we have no plan to install the clean power we need fast enough to save the planet. Even if every country were to agree tomorrow to completely eliminate their coal plant emissions by 2030, how do we think they are actually going to achieve that? There is no White House plan that explains this. There is no DOE plan. There is no plan or strategy. The deadlines will come and go and most countries will profusely apologize for not meeting their goals, just like we have with most of the signers of the Kyoto Protocol today. Apologies are nice, but they will not restore the environment.¶ We need a strategy that is believable, practical, and affordable for countries to adopt. The IFR offers our best hope of being a centerpiece in such a strategy because it the only technology we know of that can provide an economically compelling reason to change.¶ At a speech at MIT on October 23, 2009, President Obama said “And that’s why the world is now engaged in a peaceful competition to determine the technologies that will power the 21st century. … The nation that wins this competition will be the nation that leads the global economy. I am convinced of that. And I want America to be that nation, it’s that simple.”¶ Nuclear is our best clean power technology and the IFR is our best nuclear technology. The Gen IV International Forum (GIF) did a study in 2001-2002 of 19 different reactor designs on 15 different criteria and 24 metrics. The IFR ranked #1 overall. Over 242 experts from around the world participated in the study. It was the most comprehensive evaluation of competitive nuclear designs ever done. Top DOE nuclear management ignored the study because it didn’t endorse the design the Bush administration wanted.¶ The IFR has been sitting on the shelf for 15 years and the DOE currently has no plans to change that.¶ How does the US expect to be a leader in clean energy by ignoring our best nuclear technology? Nobody I’ve talked to has been able to answer that question.¶ We have the technology (it was running for 30 years before we were ordered to tear it down). And we have the money: The Recovery Act has $80 billion dollars. Why aren’t we building a demo plant?¶ IFRs are better than conventional nuclear in every dimension. Here are a few:¶ Efficiency: IFRs are over 100 times more efficient than conventional nuclear. It extracts nearly 100% of the energy from nuclear material. Today’s nuclear reactors extract less than 1%. So you need only 1 ton of actinides each year to feed an IFR (we can use existing nuclear waste for this), whereas you need 100 tons of freshly mined uranium each year to extract enough material to feed a conventional nuclear plant.¶ Unlimited power forever: IFRs can use virtually any actinide for fuel. Fast reactors with reprocessing are so efficient that even if we restrict ourselves to just our existing uranium resources, we can power the entire planet forever (the Sun will consume the Earth before we run out of material to fuel fast reactors). If we limited ourselves to using just our DU “waste” currently in storage, then using the IFR we can power the US for over 1,500 years without doing any new mining of uranium.[5]¶ Exploits our largest energy resource: In the US, there is 10 times as much energy in the depleted uranium (DU) that is just sitting there as there is coal in the ground. This DU waste is our largest natural energy resource…but only if we have fast reactors. Otherwise, it is just waste. With fast reactors, virtually all our nuclear waste (from nuclear power plants, leftover from enrichment, and from decommissioned nuclear weapons)[6] becomes an energy asset worth about $30 trillion dollars…that’s not a typo…$30 trillion, not billion.[7] An 11 year old child was able to determine this from publicly available information in 2004.

#### Inventing something cheaper is key – alternative methods can’t solve warming

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "How Does Obama Expect to Solve the Climate Crisis Without a Plan?" 7/16/9) [http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html-http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html](http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html-http%3A//www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html)

The ship is sinking slowly and we are quickly running out of time to develop and implement any such plan if we are to have any hope of saving the planet. What we need is a plan we can all believe in. A plan where our country's smartest people all nod their heads in agreement and say, "Yes, this is a solid, viable plan for keeping CO2 levels from touching 425ppm and averting a global climate catastrophe."¶ ¶ At his Senate testimony a few days ago, noted climate scientist James Hansen made it crystal clear once again that the only way to avert an irreversible climate meltdown and save the planet is to phase out virtually all coal plants worldwide over a 20 year period from 2010 to 2030. Indeed, if we don't virtually eliminate the use of coal worldwide, everything else we do will be as effective as re-arranging deck chairs on the Titanic.¶ ¶ Plans that won't work¶ ¶ Unfortunately, nobody has proposed a realistic and practical plan to eliminate coal use worldwide or anywhere close to that. There is no White House URL with such a plan. No environmental group has a workable plan either.¶ ¶ Hoping that everyone will abandon their coal plants and replace them with a renewable power mix isn't a viable strategy -- we've proven that in the U.S. Heck, even if the Waxman-Markey bill passes Congress (a big "if"), it is so weak that it won't do much at all to eliminate coal plants. So even though we have Democrats controlling all three branches of government, it is almost impossible to get even a weak climate bill passed.¶ ¶ If we can't pass strong climate legislation in the U.S. with all the stars aligned, how can we expect anyone else to do it? So expecting all countries to pass a 100% renewable portfolio standard (which is far far beyond that contemplated in the current energy bill) just isn't possible. Secondly, even if you could mandate it politically in every country, from a practical standpoint, you'd never be able to implement it in time. And there are lots of experts in this country, including Secretary Chu, who say it's impossible without nuclear (a point which I am strongly in agreement with).¶ ¶ Hoping that everyone will spontaneously adopt carbon capture and sequestration (CCS) is also a non-starter solution. First of all, CCS doesn't exist at commercial scale. Secondly, even if we could make it work at scale, and even it could be magically retrofitted on every coal plant (which we don't know how to do), it would require all countries to agree to add about 30% in extra cost for no perceivable benefit. At the recent G8 conference, India and China have made it clear yet again that they aren't going to agree to emission goals.¶ ¶ Saying that we'll invent some magical new technology that will rescue us at the last minute is a bad solution. That's at best a poor contingency plan.¶ ¶ The point is this: It should be apparent to us that we aren't going to be able to solve the climate crisis by either "force" (economic coercion or legislation) or by international agreement. And relying on technologies like CCS that may never work is a really bad idea.¶ ¶ The only remaining way to solve the crisis is to make it economically irresistible for countries to "do the right thing." The best way to do that is to give the world a way to generate electric power that is economically more attractive than coal with the same benefits as coal (compact power plants, 24x7 generation, can be sited almost anywhere, etc). Even better is if the new technology can simply replace the existing burner in a coal plant. That way, they'll want to switch. No coercion is required.

### 2

#### Nuclear terrorism is extremely likely

**Jaspal 12** – Associate Professor at the School of Politics and International Relations, Quaid-i-Azam University, Islamabad, Pakistan

(Zafar Nawaz, “Nuclear/Radiological Terrorism: Myth or Reality?”, Journal of Political Studies, Vol. 19, Issue - 1, 2012, 91:111, dml)

The misperception, miscalculation and above all ignorance of the ruling elite about security puzzles **are perilous** for the national security of a state. Indeed, in an age of transnational terrorism and **unprecedented dissemination of dualuse nuclear technology**, ignoring nuclear terrorism threat is an imprudent policy choice. The incapability of terrorist organizations to engineer fissile material **does not eliminate** completely the possibility of nuclear terrorism. At the same time, the absence of an example or precedent of a nuclear/ radiological terrorism **does not qualify the assertion** that the nuclear/radiological terrorism ought to be remained a myth. Farsighted rationality obligates that one should not miscalculate **transnational terrorist groups** — whose behavior suggests that they have a death wish — of acquiring nuclear, radiological, chemical and biological material producing capabilities. In addition, one could be sensible about the published information that **huge amount of nuclear material** is spread around the globe. According to estimate it is enough to build **more than** 120,000 **Hiroshima-sized nuclear bombs** (Fissile Material Working Group, 2010, April 1). The alarming fact is that a few storage sites of nuclear/radiological materials **are inadequately secured** and continue to be accumulated in unstable regions (Sambaiew, 2010, February). Attempts at stealing fissile material had already been discovered (Din & Zhiwei, 2003: 18). Numerous evidences confirm **that terrorist groups had aspired to acquire fissile material** for their terrorist acts. Late Osama bin Laden, the founder of al Qaeda stated that acquiring nuclear weapons was a“religious duty” (Yusufzai, 1999, January 11). The IAEA also reported that “al-Qaeda was actively seeking an atomic bomb.” Jamal Ahmad al-Fadl, a dissenter of Al Qaeda, in his trial testimony had “revealed his extensive but unsuccessful efforts to acquire enriched uranium for al-Qaeda” (Allison, 2010, January: 11). On November 9, 2001, Osama bin Laden claimed that “we have chemical and nuclear weapons as a deterrent and if America used them against us we reserve the right to use them (Mir, 2001, November 10).” On May 28, 2010, Sultan Bashiruddin Mahmood, a Pakistani nuclear scientist confessed that he met Osama bin Laden. He claimed that “I met Osama bin Laden before 9/11 not to give him nuclear know-how, but to seek funds for establishing a technical college in Kabul (Syed, 2010, May 29).” He was arrested in 2003 and after extensive interrogation by American and Pakistani intelligence agencies he was released (Syed, 2010, May 29). Agreed, Mr. Mahmood did not share nuclear know-how with Al Qaeda, but his meeting with Osama establishes the fact that the terrorist organization was in contact with nuclear scientists. Second, the terrorist group **has sympathizers in the nuclear scientific bureaucracies**. It also authenticates bin Laden’s Deputy Ayman Zawahiri’s claim which he made in December 2001: “If you have $30 million, go to the black market in the central Asia, contact any disgruntled Soviet scientist and a lot of dozens of smart briefcase bombs are available (Allison, 2010, January: 2).” The covert meetings between nuclear scientists and al Qaeda members **could not be interpreted as idle threats** and thereby the threat of nuclear/radiological terrorism is real. The 33Defense Secretary Robert Gates admitted in 2008 that “what keeps every senior government leader awake at night is the thought of a terrorist ending up with a weapon of mass destruction, especially nuclear (Mueller, 2011, August 2).” Indeed, **the nuclear deterrence strategy** cannot deter **the transnational terrorist syndicate** from nuclear/radiological terrorist attacks. Daniel Whiteneck pointed out: “**Evidence suggests**, for example, that al Qaeda might not only use WMD simply to demonstrate the magnitude of its capability but that it might actually welcome **the escalation of a strong U.S. response**, **especially if it included** catalytic effects **on governments** and societies in the Muslim world. An adversary that prefers escalation regardless of the consequences cannot be deterred” (Whiteneck, 2005, Summer: 187) Since taking office, President Obama has been reiterating that “nuclear weapons represent the ‘gravest threat’ to United States and international security.” While realizing that the US could not prevent nuclear/radiological terrorist attacks singlehandedly, he launched 47an international campaign to convince the international community about the increasing threat of nuclear/ radiological terrorism. He stated on April 5, 2009: “Black market trade in nuclear secrets and nuclear materials abound. The technology to build a bomb has spread. Terrorists are determined to buy, build or steal one. Our efforts to contain these dangers are centered on **a global non-proliferation regime**, but as more people and nations break the rules, we could reach the point where **the center cannot hold** (Remarks by President Barack Obama, 2009, April 5).” He added: “One terrorist with one nuclear weapon could unleash massive destruction. Al Qaeda has said it seeks a bomb and that it would have no problem with using it. And we know that there is unsecured nuclear material across the globe” (Remarks by President Barack Obama, 2009, April 5). In July 2009, at the G-8 Summit, President Obama announced the convening of a Nuclear Security Summit in 2010 to deliberate on the mechanism to “secure nuclear materials, combat nuclear smuggling, and prevent nuclear terrorism” (Luongo, 2009, November 10). President Obama’s nuclear/radiological threat perceptions were also accentuated by the United Nations Security Council (UNSC) Resolution 1887 (2009). The UNSC expressed its grave concern regarding ‘the threat of nuclear terrorism.” It also recognized the need for all States “to take effective measures to prevent nuclear material or technical assistance becoming available to terrorists.” The UNSC Resolution called “for universal adherence to the Convention on Physical Protection of Nuclear Materials and its 2005 Amendment, and the Convention for the Suppression of Acts of Nuclear Terrorism.” (UNSC Resolution, 2009) The United States Nuclear Posture Review (NPR) document revealed on April 6, 2010 declared that “terrorism and proliferation are far greater threats **to the United States and international stability**.” (Security of Defence, 2010, April 6: i). The United States declared that it reserved the right to“hold fully accountable” any state or group “that supports or enables terrorist efforts to obtain or use weapons of mass destruction, whether by facilitating, financing, or providing expertise or safe haven for such efforts (Nuclear Posture Review Report, 2010, April: 12)”. This declaration underscores the possibility that terrorist groups could acquire fissile material from the rogue states.

#### the only impediment to escalating terror is access to spent fuel

NTI, 12 [Nuclear Threat Initiative, August 1st,“Why Is Highly Enriched Uranium a Threat?”, <http://www.nti.org/analysis/reports/civilian-heu-reduction-and-elimination/>]

Why Is Highly Enriched Uranium a Threat? The most difficult challenge for a terrorist organization seeking to build a nuclear weapon or [improvised nuclear device](http://www.nti.org/glossary/improvised-nuclear-device-ind/) is obtaining [fissile material](http://www.nti.org/glossary/fissile-material/), either [plutonium](http://www.nti.org/glossary/plutonium-pu/) or [highly enriched uranium (HEU)](http://www.nti.org/glossary/highly-enriched-uranium-heu/). HEU, [uranium](http://www.nti.org/glossary/uranium/) that has been processed to increase the proportion of the U-235 [isotope](http://www.nti.org/glossary/isotope/) to over 20%, is required for the construction of a [gun-type nuclear device](http://www.nti.org/glossary/gun-type-nuclear-weapon/), the simplest type of nuclear weapon. The greater the proportion of U-235 (i.e. the higher the [enrichment](http://www.nti.org/glossary/enriched-uranium/) level), the less material is needed for a nuclear explosive device. [Weapons-grade uranium](http://www.nti.org/glossary/weapons-grade-material/) generally refers to uranium enriched to at least 90%, but material of far lower enrichment levels, found in both fresh and [spent nuclear fuel](http://www.nti.org/glossary/spent-nuclear-fuel/), can be used to create a nuclear explosive device. In 2002, the U.S. National Research Council warned that "crude HEU weapons could be fabricated without state assistance," noting that "the primary impediment that prevents countries or technically competent terrorist groups from developing nuclear weapons is the availability of [nuclear material], especially HEU."[1] Creating a nuclear weapon from HEU is technically easier than building a [plutonium](http://www.nti.org/glossary/plutonium-pu/) weapon. Moreover, current technology is unlikely to detect a shielded nuclear device on a truck or boat. Therefore, securing and eliminating stocks of HEU is the surest way to decrease the risk that terrorist groups could use this material to create a nuclear explosion. Where Is Civilian HEU Located? Experts estimate that approximately 70 tons of HEU are used in civilian applications worldwide. [2] As little as 25 kilograms (kg) of U-235 (which amounts to about 28kg of HEU enriched to 90%) is needed to produce a nuclear weapon; about 40-60kg is needed for a cruder nuclear device. [3] Bomb-grade material can be obtained from HEU that is fresh (unirradiated), and [irradiated](http://www.nti.org/glossary/irradiate/) (also referred to as spent). Fresh and lightly irradiated fuel (such as fuel used in critical assemblies and pulse reactors) is not significantly [radioactive](http://www.nti.org/glossary/radioactivity/), and is therefore relatively safe to handle. Although using nuclear fuel in high-powered reactors initially makes it highly radioactive and thus very difficult to handle safely (often this fuel is referred to as "self-protecting"), [spent fuel](http://www.nti.org/glossary/spent-nuclear-fuel/) loses its radioactivity over time, making it easier to handle and potentially more attractive to terrorists. HEU is currently used in the civilian sphere to fuel [research reactors](http://www.nti.org/glossary/research-reactor/), critical assemblies, pulsed reactors, and a few fast reactors. According to the [International Atomic Energy Agency (IAEA)](http://www.nti.org/glossary/international-atomic-energy-agency/), 244 research reactors are in operation or temporarily shut down across 56 countries. A further 441 reactors have been shut down or decommissioned, while eight are planned or under construction. [4] Many of the research reactors that have been shut down, but not decommissioned, have spent HEU fuel on-site. The IAEA database notes that over 20,000 spent fuel assemblies from research reactors are enriched to levels above 20 percent. Nearly half of these stored fuel assemblies are enriched to levels at or above 90 percent.[5] That said, there is no current comprehensive, authoritative inventory of civil HEU globally, which is a major obstacle to progress in this area. According to the Government Accountability Office, even the [United States](http://www.nti.org/country-profiles/united-states/) has failed to maintain an accurate inventory of the HEU that it has exported over the years as attempts to balance the books could only account for 10 percent of the material. [6] The United States and the [Soviet Union](http://www.nti.org/country-profiles/russia/) supplied much of the HEU fuel used in research reactors world-wide. Other producers include [China](http://www.nti.org/country-profiles/china/) (which sent HEU fuel for research reactors to Nigeria, Ghana, [Iran](http://www.nti.org/country-profiles/iran/), [Pakistan](http://www.nti.org/country-profiles/pakistan/), and [Syria](http://www.nti.org/country-profiles/syria/), as well as enriched uranium to [South Africa](http://www.nti.org/country-profiles/south-africa/), and [Argentina](http://www.nti.org/country-profiles/argentina/)); [France](http://www.nti.org/country-profiles/france/) (to Chile and [India](http://www.nti.org/country-profiles/india/)); the [United Kingdom](http://www.nti.org/country-profiles/united-kingdom/) (to [Australia](http://www.nti.org/country-profiles/australia/), India, and [Japan](http://www.nti.org/country-profiles/japan/)); and South Africa (which did not export this fuel).[7] Before 1978, when Washington and Moscow became concerned about the implications of their exports of highly enriched fuels, most of the fuel supplied by the United States (the bulk of which went to North American and the Asia-Pacific), was of very high enrichment levels (90% and above). The Soviet-supplied fuel, chiefly sent to Eastern Europe, was typically 80% enriched. Under several U.S.-led initiatives, many countries have returned HEU fuel, both fresh and spent, to its country of origin in order to reduce the risk of theft. HEU is also used in targets in reactors that produce [medical isotopes](http://www.nti.org/glossary/medical-isotopes/). HEU is used for this purpose annually in reactors in Belgium, Canada, France, the Netherlands, and Russia.[8] Other countries, including Australia and [Indonesia](http://www.nti.org/country-profiles/indonesia/), have begun producing these isotopes with [LEU](http://www.nti.org/glossary/low-enriched-uranium-leu/) targets, and still other countries, such as [Egypt](http://www.nti.org/country-profiles/egypt/), are currently developing and implementing their LEU target-based production process. [9] In particular, South Africa—a major exporter—converted its Safari-1 reactor to rely on both LEU targets and fuel for the production of [medical isotopes](http://www.nti.org/glossary/radioisotope/). Most of the other major producers of medical isotopes, including Canada, the Netherlands, and France, utilize LEU fuels in their reactors, but continue to rely on HEU targets. However, a number of these countries, particularly in Western Europe, have pledged to convert to LEU targets. Progress towards fuller use of LEU is not universal, however. A Russian project, for example, aims to produce enough molybdenum-99 using HEU fuel and targets to satisfy 20 percent of global demand by 2015. [10] In addition to use in research and test reactors and for medical isotope production, HEU is used in naval propulsion and space propulsion research. The material is also used for testing fast reactor core designs using [mixed oxide (MOX) fuel](http://www.nti.org/glossary/mixed-oxide-mox-fuel/). For further information on HEU in civilian applications, see [Civilian Uses of HEU](http://www.nti.org/analysis/articles/civilian-uses-heu/). Security of Civilian HEU Many civilian facilities with HEU on-site do not have adequate security. The IAEA reported that during one of its missions, it discovered a research reactor with HEU that "was observed to have essentially no physical protection." [11] The IAEA assisted the facility with enhancing its security, but reported that overall, "deficiencies remain in the legal, administrative, and technical arrangements for controlling and protecting nuclear materials ... in many countries." [12] The U.S. Department of Energy has been assisting with physical protection upgrades for 22 foreign research reactors through the Global Research Reactor Program. A September 2009 GAO report found that while most sites that have received upgrades generally met IAEA security guidelines, in some cases, critical security weaknesses remained. [23] It is not a simple matter to upgrade security measures; the majority of the world's research reactors are located in universities or other publicly accessible research centers. While security concerns have dramatically increased since 9/11, it is difficult to reconfigure a site that was not built with physical protection in mind. Storage of spent fuel stocks is generally even less secure than fresh fuel stocks, as until a few years ago spent nuclear fuel was considered "self-protecting" and few facilities wanted to spend money securing a material that was no longer of economic value. It is far more effective to remove this material from vulnerable locations than to attempt to increase security on-site. Programs to Reduce and Eliminate HEU There have been efforts to reduce the amount of HEU at civilian facilities since 1978, when Washington initiated the [Reduced Enrichment for Research and Test Reactors (RERTR) Program](http://www.nti.org/glossary/rertr-program/). Moscow also began its own program to reduce enrichment at Soviet-built research reactors outside of the Soviet Union, and changed its HEU export policies, supplying these reactors with 36% HEU in lieu of 80% HEU. In the past 25 years, many countries have cooperated with the RERTR program or initiated their own, similar programs. In May 2004, the U.S. Department of Energy launched the [Global Threat Reduction Initiative (GTRI](http://www.nti.org/glossary/global-threat-reduction-initiative/)), which the IAEA, Russia, and others have since joined. Among its goals, the GTRI seeks to "minimize and eventually eliminate any reliance on HEU in the civilian fuel cycle, including conversion of research and test reactors worldwide from the use of HEU to the use of LEU fuel and targets." As of early 2012, U.S.-led efforts have converted to LEU or verified the shut down of 88 HEU-fueled facilities.[14] The RERTR program is also working on the conversion of a handful of medical isotope producers that use HEU targets in their reactors. The program includes some of the largest producers of medical isotopes, located in Europe. To date, the RERTR program has helped to successfully convert isotope-producing reactors in Argentina and South Africa. At present, there are no longer any technical barriers to conversion to LEU and only political and financial issues remain. [15] Besides converting facilities to use LEU fuel and targets, there have also been efforts to consolidate fresh and spent HEU fuel at a smaller number of relatively secure locations. This has involved removing the fuel, mostly to the United States and Russia, from other countries, as well as consolidating the fuel within countries. U.S. programs in this area (the Russian Research Reactor Fuel Return program to repatriate fuel to Russia, and the Foreign Research Reactor Spent Nuclear Fuel Acceptance Program to repatriate U.S.-origin fuel), have all been subsumed under the 2004 GTRI initiative. Together, the two programs have returned over 2,735kg of spent and fresh HEU fuel to the United States and Russia as of 2012. [16] According to the IAEA's definition of the quantity of HEU necessary to construct a nuclear explosive device, the amount of repatriated HEU is equivalent to up to 80 weapons. [17] Despite the progress of these efforts, many HEU sites remain worldwide, with a significant portion of them located in Russia. [26] A related program, the Material Consolidation and Conversion (MCC) project, established in 1999, reduces this excess Russian civilian HEU by blending it down into LEU. As of the end of 2011, approximately 13.5 of an estimated 17 tons of U-235 in excess Russian civilian HEU had been blended down. [18] Both the United States and Russia also have large quantities of excess HEU from their defense programs. In Russia, excess HEU from weapons is blended down to LEU within the framework of the Megatons to Megawatts program (also known as the [HEU-LEU program](http://www.nti.org/glossary/heu-deal/)). The resulting LEU is then released for civilian use. The program will end in 2013, at which point 500 tons of HEU will have been downblended. [19] The United States initially declared some 174 metric tons of HEU as excess to military needs, designating this material as civilian. [20] An additional 200 metric tons were officially removed from the U.S. weapons stockpile in November 2005. [21]

#### That’s key to the nuclear taboo – solves nuclear war

Bin ‘9(5-22-09 About the Authors Prof. Li Bin is a leading Chinese expert on arms control and is currently the director of Arms Control Program at the Institute of International Studies, Tsinghua University. He received his Bachelor and Master Degrees in Physics from Peking University before joining China Academy of Engineering Physics (CAEP) to pursue a doctorate in the technical aspects of arms control. He served as a part-time assistant on arms control for the Committee of Science, Technology and Industry for National Defense (COSTIND).Upon graduation Dr. Li entered the Institute of Applied Physics and Computational Mathematics (IAPCM) as a research fellow and joined the COSTIND technical group supporting Chinese negotiation team on Comprehensive Test Ban Treaty (CTBT). He attended the final round of CTBT negotiations as a technical advisor to the Chinese negotiating team. Nie Hongyi is an officer in the People’s Liberation Army with an MA from China’s National Defense University and a Ph.D. in International Studies from Tsinghua University, which he completed in 2009 under Prof. Li Bin. )

The nuclear taboo is a kind of international norm and this type of norm is supported by the promotion of the norm through international social exchange. But at present the increased **threat of nuclear terrorism has lowered people’s confidence that nuclear weapons will not be used**. China and the United States have a broad common interest in combating nuclear terrorism. **Using technical and institutional measures to break the foundation of nuclear terrorism and lessen the possibility of a nuclear terrorist attack can** not only weaken the danger of nuclear terrorism itself but also **strengthen people’s confidence in the nuclear taboo**, and in this way preserve an international environment beneficial to both China and the United States. In this way **even if there is crisis** in China-U.S. relations caused by conflict, **the nuclear taboo can** also help both countries **reduce suspicions** about the nuclear weapons problem, **avoid miscalculation and thereby reduce the danger of a nuclear war.**

#### Causes extinction – retal

**Ayson 10** (Robert, Professor of Strategic Studies, Director of Strategic Studies: New Zealand, Senior Research Associate with Oxford’s Centre for International Studies. “After a Terrorist Nuclear Attack: Envisaging Catalytic Effects. Studies in Conflict and Terrorism, Volume 33, Issue 7, July 2010, pages 571-593)

Washington's early response to a terrorist nuclear attack on its own soil might also raise the possibility of an unwanted (and nuclear aided) confrontation with Russia and/or China. For example, in the noise and confusion during the immediate aftermath of the terrorist nuclear attack, the U.S. president might be expected to place the country's armed forces, including its nuclear arsenal, on a higher stage of alert. In such a tense environment, when careful planning runs up against the friction of reality, it is just possible that Moscow and/or China might mistakenly read this as a sign of U.S. intentions to use force (and possibly nuclear force) against them. In that situation, the temptations to preempt such actions might grow, although it must be admitted that any preemption would probably still meet with a devastating response. As part of its initial response to the act of nuclear terrorism (as discussed earlier) Washington might decide to order a significant conventional (or nuclear) retaliatory or disarming attack against the leadership of the terrorist group and/or states seen to support that group. Depending on the identity and especially the location of these targets, Russia and/or China might interpret such action as being far too close for their comfort, and potentially as an infringement on their spheres of influence and even on their sovereignty. One far-fetched but perhaps not impossible scenario might stem from a judgment in Washington that some of the main aiders and abetters of the terrorist action resided somewhere such as Chechnya, perhaps in connection with what Allison claims is the “Chechen insurgents' … long-standing interest in all things nuclear.”42 American pressure on that part of the world would almost certainly raise alarms in Moscow that …might require a degree of advanced consultation from Washington that the latter found itself unable or unwilling to provide.

#### And, the plan solves unauthorized diversion

**Archambeau et al 11** – Science Council for Global Initiatives

(Charles, with Randolph Ware, Tom Blees, Barry Brook, Yoon Chang, Jerry Peterson, Robert Serafin, Joseph Shuster, Evgeny Velikhov, and Tom Wigley, “The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs”, google it, dml)

Pyroprocessing was originally developed for integration with a fast reactor, but it can also be used in a stand-alone mode to **treat spent fuel** from today's commercial reactors with the addition of a front-end step to convert the used oxide fuel to metallic form. **Pyroprocessing** eliminates **the ability to use the reactor's nuclear materials directly in weapons** because it cannot separate out any Plutonium (Pu). Instead, it keeps the major nuclear fuels, Uranium and Plutonium mixed, at all times, with other actinides and fission products. This mixture is protected **against theft or unauthorized diversion** because the mixture is extremely radioactive and must be handled remotely with sophisticated and specialized equipment.

#### IFR key

**Archambeau et al 11** – Science Council for Global Initiatives

(Charles, with Randolph Ware, Tom Blees, Barry Brook, Yoon Chang, Jerry Peterson, Robert Serafin, Joseph Shuster, Evgeny Velikhov, and Tom Wigley, “The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs”, google it, dml)

The pyroprocessor unit can be used as a stand-alone system to process LWR waste from any open cycle reactor into fuel for IFR closed cycle reactors. The depleted Uranium produced by the enrichment of Uranium ore can also be processed to generate additional IFR fuel. The current amount of LWR waste, plus the amount of depleted Uranium in stock piles world-wide, is sufficient to supply fuel to all the IFR plants needed and in fact to supply the world's required energy for about 1000 years.3 The problem of storage of current LWR waste and depleted Uranium waste from refining of mined Uranium is therefore solved by pyroprocessor generation of IFR fuel, along with a relatively small mass of short-lived fission products which can be easily and safely stored. Uranium can also be extracted from sea water using IFR power sources (see, for example, Cohen, 1983). Because Uranium is constantly added to seawater by erosion processes, then the IFR fuel source is effectively unlimited. Therefore, IFR power plants do not require fuel from regular mining operations, as does a LWR powered plant, but can use pyroprocessor generated fuel essentially indefinitely. In this sense the IFR is a "renewable" energy source which can be expanded, essentially indefinitely, to meet demand.

### New plan

#### The United States federal government should initiate a new Manhattan Project in the United States for Integral Fast Reactors.

### 3

#### Next advantage is the Manhattan project

#### The plan ensures SPRISM expansion - market approaches fail to catalyze investment – Manhattan approach key to solidify a US lead role

Kirsch, 09 [Steve Kirsch, “The Integral Fast Reactor (IFR) project: Q&A” Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, <http://skirsch.com/politics/globalwarming/ifrQandA.htm>]

Q. If this is really so good, how come GE isn't building S-PRISM on their own nickel? Nobody wants to risk it since it isn't a slam dunk. You don't get a reward if you solve global warming. And government funding doesn't seem to be so easy. DOE tried to get funding for GNEP (which included IFR technology) and got shot down (so far). GE is a large conservative corporation. They already service a fleet of lightwater reactors, are building more of them around the world, and have the promise of yet more. It's hard enough in this country to move into new levels of reactor technology without trying to leapfrog straight into the 4th generation. Their 3rd generation ESBWR is in the 5th round of NRC certification, whereas the S-PRISM (a souped up and more developed version of the PRISM) isn't at the starting gate. These things take years at the glacial pace of the NRC, though of course if President Obama decided to go all Manhattan project on it we could most definitely get there quickly enough. If GE started pushing 4th generation breeder reactors, can you imagine the hue and cry from the antie groups? What's their incentive to do that? If they're convinced that ultimately we'll end up at 4th generation reactors anyway and they can make plenty of dough and keep a low profile just taking the go slow approach, don't you imagine that's exactly what they'll do? Besides, conceivably another country with whom we have nuclear technology sharing agreements might very well certify and build it before the NRC ever gets out of the starting gate, which would make it much easier for the eventual NRC certification. Q. If this is really so good, how come someone in government isn't trying to get it restarted? The DOE is attempting to resuscitate fast-reactor technology, as part of the GNEP (Global Nuclear Energy Partnership) initiative. See <http://www.gnep.energy.gov/gnepPRs/gnepPR011007.html>, and <http://www.gnep.energy.gov/>. The IFR is one form of fast-reactor technology (metallic fuel with pyroprocessing), but there are others -- inferior, according to the IFR scientists. The important thing these days is to get the U.S. back into a leadership role in the development and management of nuclear power, recognizing that recycling in fast reactors is necessary if the long-lived waste is to be consumed, and if the full energy potential of the uranium is to be exploited. The GNEP would resuscitate fast-reactor technology in this country. Q. Critics claim fast reactors are “expensive to build, complex to operate, susceptible to prolonged shutdown as a result of even minor malfunctions, and difficult and time-consuming to repair.” I'm not aware of anyone who is an expert on Integral Fast Reactor technology (who actually really understands the science) who has this view. One Nobel prize winning physicist who was recently briefed on the IFR (Burton Richter, former Director of SLAC) told me that, at best, there is insufficient scientific evidence to make such a statement. Is there someone who knows the fast reactor science as well as Dr. Chang or Dr. Till who holds that view? Certainly not the MIT study (as they admitted up front). So whose expert opinion are you relying on here? Secondly, if your statement was true, then aren't these statements directly in direct conflict with the facts? If the critics are to be relied upon, then none of the following would have been possible at all: – The Monju reactor was undamaged by the fire (rated 1 on a scale of 0 to 7, with 7 being the most serious accident), and has been kept shut down for political reasons. I think it has been given the go-ahead to start up. – The EBR-II fast reactor worked flawlessly for many years (<http://www.world-nuclear.org/info/inf98.html> 31 years from 1963-1994) – The Phenix fast reactor in France has been on-line for decades. – The Superphenix reactor was shut down for political reasons, after it finally had its problems behind it and was working well. – The Russian BN-600 has been working well for decades. Ray Hunter was for the past 29 years as the former Deputy Director of the Office of Nuclear Energy, Science and Technology in the U.S. Department of Energy (DOE). Should his view count? Here's what he wrote to me: My name is Ray Hunter. I am the former Deputy Director of the Office of Nuclear Energy, Science and Technology in the U.S. Department of Energy (DOE). I spent more than 29 years in DOE and the predecessor agencies working on developing advanced nuclear reactors for civilian nuclear power applications. After evaluating several alternatives, I came to the conclusion that a sodium cooled fast reactor using metal fuel and non aqueous reprocessing offered the best option to compliment and eventually replace Light Water Reactors (LWR’s). The basis for my conclusion was the successful proof of principle demonstration work completed by Argonne National Laboratory. It is important to understand that there were had two versions of the IFR concept; the second version involved a sodium cooled reactor using mixed uranium oxide and plutonium oxide fuel and aqueous reprocessing. The second version required separating Plutonium-239 for fabrication into new fuel which was considered to be a major proliferation issue. Unfortunately, the Clinton administration considered all fast reactors concepts as too much of a proliferation risk and cancelled all work on fast reactors. Actually, the decision to forgo processing of LWR fuel as enacted into law by 1982 Radioactive Waste Management Policy Act was the precursor for ending fast reactor technology development. The Department did continue to support in corporation with industry advanced LWR designs for future use. These advanced designs have been approved by the Nuclear Regulatory Commissions but none have been ordered in the U.S. because of the unresolved waste issue and the economic risk of trying to build and license a nuclear power plant in the U.S. Versions of these advanced LWR designs have already been built and are operating in Japan and South Korea. The ill conceived U.S. policy of a once through LWR fuel cycle has never been adopted by any other nuclear power nation. According to Senator Reid, Yucca Mountain will not proceed as long as his any say in the matter. Until there is a path forward on LWR spent fuel, it is unlikely any new nuclear plant will be built in the U.S. The technical facts clearly show that the most cost effective and environmentally sound way to deal with LWR spent fuel is use the IFR concept with metal fuel and non aqueous reprocessing. While the proposed GNEP concept does not require plutonium separation, it is still based on oxide fuel and aqueous reprocessing which does allay proliferation concerns. Also, the GNEP concept is being offered as global solution for minimizing nuclear proliferation based on certain countries doing reprocessing including the U.S. but our current law precludes it. I am attaching [a recent letter I sent to Senator Reid](http://skirsch.com/politics/ifr/RayHunterLetterToSenatorReid.doc). In my judgment, we need to focus on the waste issue to break the logjam on nuclear power in the U.S. We don’t need to deploy the IFR in the private sector for the foreseeable future to get the benefits of expanded nuclear power use. If inviting the IAEA to oversee IFR facilities at government sites would promote acceptance of reprocessing, then we should proceed accordingly. Any thoughts you have on this matter would be appreciated. Q. A lot of critics claim the plants will be too expensive to build. The cost of a power plant is often expressed in terms of dollars per kilowatt of capacity. Every $1,000/kWe in initial cost adds, very roughly, one cent per kilowatt-hour to the cost of the electricity (assuming a 40-year write-off period and an interest rate of 8.5% per year). The cost of a nuclear plant is very hard to predict these days, because it depends heavily on the regulatory climate. In more detail, here's something Eric Loewen (GE) has written on the subject of cost: . . . This is not to say that PRISM or any other nuclear reactor will be inexpensive when built in the United States. The same GE Hitachi reactors that were built in Japan in the late 90s for about $1,400/kW are estimated to cost several times that much in the USA. Considering that the actual cost of raw materials is an insignificant portion of that price (about $35/kW), and that interest rates are at record low levels, the significantly higher price tags being bandied about by private utility companies reflects a regulatory/corporate/governmental environment that needs fixing. Part of the problem could be solved by a commitment to nuclear power from the federal government, streamlined licensing procedures for standardized designs, and shielding from interminable lawsuits like those that crippled the nuclear power industry in the 70s and 80s. There is nothing inherently uneconomical about nuclear power. Japan imports virtually all their building materials and has high labor costs. If they can build GE ABWR plants for a very reasonable price, there is no reason why the USA shouldn't be able to do the same. Q. How many IFR plants do we need to replace all the coal plants in the US? There are 200 nuclear plants now supplying 20% of our power. Coal provides about half our power. So you'd need about 400 new nuclear plants to displace all the coal plants. Q. Can you convert existing coal plants to be IFR plants? One nice thing about the S-PRISM is that they're modular units and of relatively low output (one power block of two will provide 760 MW). They could be emplaced in excavations at existing coal plants and utilize the same turbines, condensers (towers or others), and grid infrastructure as the coal plants currently use, and the proper number of reactor vessels could be used to match the capabilities of those facilities. Essentially all you'd be replacing is the burner (and you'd have to build a new control room, of course, or drastically modify the current one). Thus you avoid most of the stranded costs. If stranded costs can thus be kept to a minimum, both here and, more importantly, in China, we'll be able to talk realistically not just about stopping to build new coal plants but replacing the existing ones, even the newest ones. Q. What about waste? George Stanford wrote the following in response to a [WSJ article](http://online.wsj.com/article/SB123690627522614525.html): In saying that "There Is No Such Thing as Nuclear Waste" (March 13), William Tucker is even more correct than he realizes. He talks about putting the "plain old U-238" back in the ground, because he thinks it's "non-fissionable." True, U-238 is not as fissionable as U-235 (which is called "fissile"), but all you have to do is put another neutron into a U-238 nucleus, and you soon have fissile Pu-239. In fact, some 30% of the power from today's reactors comes from the fissioning of Pu-239 atoms that used to be U-238. But that's not the half of it. Today's reactors are called "thermal" because their neutrons are slowed down to low ("thermal") speeds. That kind of reactor cannot extract even one percent of the energy in the uranium that was mined to make the fuel. "Fast" reactors, in which the neutrons are not slowed down, have the ability to utilize the remaining 99% -- thereby getting a hundred time as much energy from the uranium that we have dug up. Other countries (India, China, France, Japan, Russia, South Korea) are working to implement fast reactors. The United States used to be the leader in the field, but no longer is, because development of our fast reactor -- the IFR -- was terminated in 1994, for non-technical reasons. However, General Electric continued a low-level effort, and now stands ready to build a commercial-scale demonstration plant, given the needed seed money. With IFRs we could power the nation for centuries without mining another ounce of uranium. The only waste from an IFR is about a ton of fission products (broken uranium atoms) per year for every moderately big (1000 MW) power plant -- and many of those elements have commercial value. Moreover, their radioactivity decays to insignificance within 500 years.

#### And, the plan causes rapid tech commercialization – scalability and scope key

Barton, 09 [Charles, writing at the Energy Collective, “A Second Manhattan Project?”, <http://theenergycollective.com/charlesbarton/31802/second-manhattan-project>]

The conventional view is that it would take a long time to develop Generation IV nuclear technology. This is mistaken because the Indians expect to complete a commercial Generation IV Fast Breeder Prototype Reactor in 2011, and then begin to build standard production reactors immediately after. They currently expect to complete at least 4 commercial fast breeders by 2020, and more later. The long gestation period view assumes that the development of Generation IV technology would be conducted with business as usual approaches. But if we think that the fate of human society would rest on the pace of a Generation IV development project, would a business as usual approach make sense? Alternatives would be a simi-Manhatten project model and a mini-Manhattan project approach. The difference would have to do with time scale, with the Simi-Manhattan project approach trying to bring in everything in a two to three year time range, while the mini approach might take 5 years. The mini approach might cost $20 billion, perhaps twice the cost of the business as usual approach, but at the end of the five years a saleable product, and a factory to build it would be ready. Let me illustrate what I mean by the Manhattan Project approach. The Mahnattan Project was a massive research, development and production project conducted during World War II. The aim of the project was the development of deliverable nuclear weapons. That goal was meet. Rather than develop one single approach to the project, and perfect it, project scientists undertook to develop parallel approaches to project goals. Scientists identified two fissionable materials that could be used in Nuclear Weapons, U-235 and Pu-239. Rather than settle on one approach, they decided to develop two weapons, each using one of the fissionable matereials. The method of producing Pu-239 was deemed very dangerous, and the production facility was located in a desert in Washington State. Production at the Washington State site was to be accomplished through the use of 3 large, experimental reactors of a type never built before. Construction of the reactors began in August 1943, The first was finished in September 1944, and the final reactor was completed by February 1945. The entire 3 reactor project was completed in 18 months. Despite questions about the safety of their design, the Hanford reactors never had a serious accident. Their designer, Eugene Wigner was trained by a chemical engineer who had done notable chemistry research in the 1930's. A further research reactor was build in Oak Ridge with an overlapping time schedule to the Hanford Reactors. The X-10 Graphite Reactor, was intended to produce plutonium for the research required to waponize it. The designer of the Graphite Reactor was a young scientist, who had recently acquired a PhD in biophysics from the University of Chicago. Despite the fact that the youthful Alvin Weinberg had more training in biology and mathamatics than in physics, and had no engineering training at all, he was able to design a reactor that was built in 10 months, and performed flawlessly, and proved a valuable research tool. Thus from December 1942, when Enrico Fermi's Chicago pile went critical, and November 1944, the design of reactors leaped forward by would have required a business as usual approach a generation to accomplish. Further more, the designers of these reactors would have been viewed as completely unqualified to perform this task, because they lacked the proper educational background. In addition to the development of reactors to facilitate the production of a plutonium based nuclear weapon, the project to develop a uranium based weapon had an equally remarkable history. Three separate uranium enrichment projects were developed in Oak Ridge. The Y-12 project developed and used electro-magnets in devices called calutrons to seperate the uranium isotopes. The calutrons required a huge amount of copper wire, and when copper was in short supply, the Manhattan project borrowed 14,700 tons of another electrical conductive metal, silver, from the United States Treasury to wire the magnets. A second uranium separation process was housed at K-25, which when finished was the largest building under one roof in the world. The K-25 project would have cost $8 billion today. While it was being built, scientists and engineers did not know if they could make the [gaseous diffusion](http://en.wikipedia.org/wiki/Gaseous_diffusion) method work. Again, a huge investment produced in months what a business as usual approach would have required years to accomplish. I would argue that given the dual crises of CO2 emissions/Anthropogenic Global Warming and Peak Oil, and the potential for Generation IV nuclear technology, a rapid nuclear development program is demanded. If a Manhattan project type endeavor were undertaken, regulation would be expedited but safety not compromised. The NRC would work alongside reactor researchers, establishing reasonable safety standards, and passing them on. During the development period the NRC should determin that reactor developments are meeting all NRC safety goals. The complete design should already have an NRC license, even before the prototype is built. In the Simi-Manhattan project alternative design approaches would be researched in parallel, while in the mini approach they might be investigated sequentially. Both would involve spending at a robust level. There are shortcuts to development including licensing sucessful technology. This might include licensing Russian BN-600 technology, Indian Fast Breeder Prototype Reactor technology, in addition too drawing on American **Experimental Breeder Reactor-II** (EBR-II) technology and experience. I am not a big fan of the LMFBR type, but it is probably inevitable that we are going to build some, and if we do, we might as well develop and build them fast. As it was being forced by the Ford administration to wind down LFTR/MSR research, [Oak Ridge National Laboratory MSR project leaders prepared a detailed developmental program for LFTR technology that would lead to solving all known developmental problems that might impeded the construction of LFTR prototype](http://www.energyfromthorium.com/pdf/ORNL-5018.pdf) (ORNL-5018). That document assumed a business as usual approach, and suggested development plans that would take a generation to realize. How much would it cost? According to [ORNL-4812](http://www.energyfromthorium.com/pdf/ORNL-4812.pdf), up to 1972 ORNL had spent $130 million dollars on MSR development. In 2009 terms this was less than than one billion dollars, In 1980 the ORNL staff estimated that a commercial DMSR could be developed for $700 million (about 2.5 billion in 2009 dollars). Given another 2.5 billion for the development of the LFTR prototype we would have a total investment of between 5 and 6 Billion 2009 dollars investment. At that point there would be a product ready to go on the assembly line. Thus the total investment in the LFTR would be comparable to the Federal investment into the LWR. It would be one fourth the investment made so far in unsuccessful American LMFBR technology. My analysis suggests that with factory production and by recycling coal fired power plants, modular LFTRs can come online for an investment as small as a dollar a watt. Let us assume that the actual cost is twice that. We still have a price for LFTRs that is lower than the 2009 price for windmills, even with a capacity factor no better than the windmills, the LFTR would be a far better buy because of its superior flexibility. It would be nice to imagine a private enterprice investing in the LFTR. Is it possible? $5 billion would not be unreasonable for a private business invest in LFTR development. There are American businesses that are capable of writing a$5 billion check for LFTR development today. Consider the €11 billion plus that Airbus invested in the development of the A380 aircraft. At a cost of $327 million, the A380 would be, if anything, more expensive than the modular LFTR. In fact it is doubtful that Airbus will ever recover the Airbus 380 development cost, while the LFTR potentially could be quite profitable. Compaired to the cost of renewables.the Manhatten project approach would be an incredible bargan. For example, the German newspaper [*Die Zeit*](http://www.expatica.com/de/news/german-news/Germany_s-solar-panel-firms-in-trouble-_56897.html) recently reported that the costs of photovoltaic instalations built in Germanyup to 2008 will amount to even more than 30 billion Euros. And how much electricity will German consumers get for their investment? A recent estimate reported that [in 2008. German PVs produced 4,300 GWh,](http://www.volker-quaschning.de/datserv/ren-Strom-D/index_e.php) about half the power output of one conventional nuclear reactor. 30 billion Euros would pay the development of both [Sandia's "Right Size" Reactor](http://atomic.thepodcastnetwork.com/2009/09/25/the-atomic-show-142-american-right-sized-reactors/), a small, factory built Fast Breeder Reactor, and the the Liquid Fluoride Thorium Reactor, a very safe, factory build reactor. Eventually, the LFTR will prove to have significant advantages over the Fast Breeder Reactors. First the core of the LFTR is smaller, hense the structure ment to house the LFTR core will be smaller, and lower cost. Secondly the LFTR has safety abvantages over the fast reactor. Even if the fast reactor proves in practice to be as safe as the LFTR, that safety is not entirely inherent, and will come at a cost. Finally, fuel reprocessing with the fast reactor, will be far more expensive than with the LFTR. Given the very great importance of a rapid, and massive world wide deployment of low cost nuclear technology capable of safely meeting human energy needs. a Manhattan Project type approach to facilitate the development of promising nuclear technology seems more than warranted. Indeed given the potentially disastrous consequences of failing to safely meet human energy needs, the rapid development of promising technology, is an imperative, not an option. - Charles

#### And, that influences global reactor adoption – forces investments that are key to competitiveness

Alexander, 08 [Lamar Alexander is the senior U.S. senator from Tennessee and chair of the Senate Republican Conference. He served as Tennessee’s governor from 1979 to 1987 and as U.S. Secretary of Education from 1991 to 1993. Tennessee’s Business | BERC, A New Manhattan Project for Clean Energy Independence, <http://frank.mtsu.edu/~berc/tnbiz/economy/pdfs/alexander.pdf>]

I propose that the United States launch a new Manhattan project: a five-year project to put America firmly on the path to clean energy independence. Instead of ending a war, the goal will be clean energy independence — so that we can deal with rising gasoline prices, electricity prices, clean air, climate change, and national security — for our country first, and, because other countries have the same urgent needs and therefore will adopt our ideas, for the rest of the world. The overwhelming challenge today . . . is to discover ways to satisfy the human demand for and use of energy in an environmentally satisfactory and affordable way so that we are not overly dependent on overseas sources. By independence I do not mean that the United States would never buy oil from Mexico or Canada or Saudi Arabia. By independence I mean that the United States could never be held hostage by any country for our energy needs. In 1942, many were afraid that the first country to build an atomic bomb could blackmail the rest of the world. Today, countries that supply oil and natural gas can blackmail the rest of the world. Not a New Idea A new Manhattan Project is not a new idea, but it is a good idea and fits the goal of clean energy independence. The Apollo Program to send men to the moon in the 1960s was a kind of Manhattan Project. Presidential candidates John McCain and Barack Obama have called for a Manhattan Project for new energy sources. So have former House Speaker Newt Gingrich, Democratic National Committee Chairman Howard Dean, and Senators Susan Collins of Maine and Kit Bond of Missouri, among others. And, throughout the two years of discussion that led to the passage in 2007 of the America COMPETES Act, several participants suggested that focusing on energy independence would force the kind of investments in the physical sciences and research that the United States needs to maintain its competitiveness.

#### And, the spillover effects bolster all major US industries

Leopold, 12 [9 Kick-Ass Things Obama Should Do In a Second Term

The chances are rising for an Obama second term. But what do we really want him to do?, http://www.alternet.org/story/154123/9\_kick-ass\_things\_obama\_should\_do\_in\_a\_second\_term?page=0%2C1&paging=off]

4. Manhattan Project for renewable energy. To help win WWII, America created the massive Manhattan Project to build the first atomic weapons. To help win the Cold War, American created NASA and won the race to the moon. To win the battle against climate change, we’ll need a similar effort to create the next generation of renewable energy technologies to replace fossil fuels. Not only would such a project lead to a new, clean energy infrastructure, but the knowledge gained along the way would invigorate nearly every industry in our economy.

#### The impact is great power war

Baru 9 - Visiting Professor at the Lee Kuan Yew School of Public Policy in Singapore (Sanjaya, “Year of the power shift?,”

http://www.india-seminar.com/2009/593/593\_sanjaya\_baru.htm

 **T**here is no doubt that economics alone will not determine the balance of global power, but there is no doubt either that economics has come to matter for more. The management of the economy, and of the treasury, has been a vital aspect of statecraft from time immemorial. Kautilya’s *Arthashastra* says, ‘From the strength of the treasury the army is born. …men without wealth do not attain their objectives even after hundreds of trials… Only through wealth can material gains be acquired, as elephants (wild) can be captured only by elephants (tamed)… A state with depleted resources, even if acquired, becomes only a liability.’4 Hence, economic policies and performance do have strategic consequences.5 In the modern era, the idea that strong economic performance is the foundation of power was argued most persuasively by historian Paul Kennedy. ‘Victory (in war),’ Kennedy claimed, ‘has repeatedly gone to the side with more flourishing productive base.’6 Drawing attention to the interrelationships between economic wealth, technological innovation, and the ability of states to efficiently mobilize economic and technological resources for power projection and national defence, Kennedy argued that nations that were able to better combine military and economic strength scored over others. ‘The fact remains,’ Kennedy argued, ‘that all of the major shifts in the world’s *military-power* balance have followed alterations in the *productive* balances; and further, that the rising and falling of the various empires and states in the international system has been confirmed by the outcomes of the major Great Power wars, where victory has always gone to the side with the greatest material resources.’7 **I**n Kennedy’s view the geopolitical consequences of an economic crisis or even decline would be transmitted through a nation’s inability to find adequate financial resources to simultaneously sustain economic growth and military power – the classic ‘guns vs butter’ dilemma.

#### And, the mechanism of the plan ensures international cooperation centered on a US lead role

Norris, 08 [Lessons of the Manhattan Project By Robert S. Norris Natural Resources Defense Council A presentation to the National Academies’ Committee on Science, Engineering and Public Policy (COSEPUP) September 5, 2008. <http://docs.nrdc.org/nuclear/files/nuc_08100901A.pdf>]

Modern large-scale R&D efforts to address national problems such as climate change are much more complex. There are certain programs that address the climate change challenge that may well profit from Manhattan Project-like approaches. There is a clear need for large-scale, governmentled efforts to develop “transformational technologies,” such as solar and wind power. It is the technical problems that can most benefit from applying Manhattan Project lessons. A reallocation of resources is also essential. The $10 billion dollars we spend each month in Iraq could fund multiple climate change Manhattan Projects.The social, political, and economic dimensions of the problem are much more difficult to solve. The forecasts about climate change are dire. According to one prominent environmentalist, contemporary capitalism and a habitable planet cannot coexist. I should add that James “Gus” Speth, who writes about this in his recent book, The Bridge at the End of the World is a founder of my organization and is on our Board. The causes of global warming and climate change go to the heart of how our society and economy operates. Any remedies must go to similar deep levels to realistically confront the challenges. Can corporations and Wall Street adjust to such dramatic changes? Are there political forces strong enough to inspire the nation to join together, to sacrifice, and work diligently to solve the problem? A major difference from World War II is that the threat to our way of life and possibly survival is now worldwide and not just national in scope. Climate change is not just an American problem. Addressing it on a global scale could be an opportunity for international cooperation—one where the United States, under the right conditions might organize and lead an effort on the necessary scale required for a solution. As I understand it the Academy is considering undertaking a study on designing crash R&D projects and what the appropriate terms of reference for such a study should be. There is no lack of challenges before us. At the outset it seems a valuable exercise to examine past crash efforts to see what has worked and perhaps equally valid what hasn’t worked. I hope that my comments here this morning may have helped that process.

#### And, collaboration attracts scientists and causes international development of nuclear technology – independently solves global nuclear war and unforeseen problems

Kuonqi, 08 [Responding to Clear and Present Dangers: A New Manhattan Project for Climate Change?, Christopher Kuonqui UNDP, Human Development Report 2007/2008, <http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/kuonqui_christopher.pdf>]

Events moved forward rapidly. Chief engineer J. Robert Oppenheimer hosted a conference on nuclear fission in summer 1942, and walked through the gates of the Los Alamos National Laboratories, New Mexico, USA, on 25 November 1942. Roosevelt and Winston Churchill signed the Quebec Agreement on 19 August 1943, bringing a team of British physicists on board. On 16 July 1945, the first nuclear explosion was tested, with wartime use of two of the four bombs constructed by the Project on 9 and 12 August in Japan. Officially dismantled on 1 January 1947, with the creation of the civilian Atomic Energy Commission, the Manhattan Project proved an overwhelming triumph and the paradigmatic exemplar of technological achievement for the decades that followed. Within a short period of time, one of the greatest technologies in human history went from the germs of an idea to successful fruition. The challenges of meeting carbon emissions to counter the threats of climate change demand no less an effort. What made the Manhattan Project work? Political will was converted into financial capital: the project spent over $20 billion (in 1996 dollars), employing over 130,000 people. Great scientific leadership took charge, with many of the best scientific minds of the 20th century working together against the threat of the Axis powers developing the atomic bomb first. And a powerful coalescence of scientific and intensive administration skill facilitated the coordination of over 30 separate research facilities, across three countries and two continents. These elements—cocktailed with the appropriate caveats and exceptions—serve as powerful parallels to the possibilities of developing technology to curb carbon emissions. The three central sites, at first maintained secretly, included the Los Alamos National Laboratory where the final assembly of the bombs took place, costing over $845 million; the Oak Ridge facilities, billed at nearly $14 billion, was the site for uranium production, at one point consuming more than 1/6th of the electrical power produced in the USA, greater than New York City at the time; and the Hanford Engineer Works, over 2,600 square kilometers, was the plutonium production center, at over $4 billion. The total cost 2 of WWII for the United States was approximately $3.3 trillion with the majority of funding going to conventional weaponry including $31.5 billion on bombs, mines and grenades, and $64 billion on tanks. By comparison, despite its overwhelming power to decide the outcome of the Second World War, the core funds spent on other wartime expenditures dwarf the costs of the Manhattan Project. The specifics of the costs for climate change technology need not bear any similarity to these figures. Tying budgetary strings to political and social will, however, does – it serves as the pivotal first step towards getting onto the path of technological innovation at the scale needed to fight the impending calamities of climate change. One unique element of the Manhattan Project continues to riddle historians of science today: how could the period leading up to WWII have been such a flood shed moment for science? Niel Bohr’s working out the structure of the atom and Enrico Fermi’s fission experiments, to name only two of the scientific innovations towards the atomic bomb, are paramount achievements unto themselves. The political acumen of many of these great scientific minds, as exemplified in the Szilárd-Einstein letter to Roosevelt, underscores the importance of a nuanced joining of forces of the scientific and political communities. Further, the possibility of the atomic bomb being developed by the Axis powers fixed the nature of the danger to overcome. The coordination of scientific, political and military strengths and interests is perhaps the most enduring lesson of the Manhattan Project, embodied in the figures of General Leslie Grove and J. Robert Oppenheimer. Groves’s leadership, recognized in overseeing largescale, multi-billion dollar construction projects during the 1940-1942 mobilization period, transformed the theoretical and laboratory research effort of a few universities into a fast moving, highly coordinated project including thousands of scientists, engineers, technicians, workmen, and soldiers, as well as hundreds of companies and governmental organizations. The administrative skill to undertake the Project was paramount for its success. Groves also had the vision to appoint Oppenheimer to head the key think-tank of the Project at Los Alamos. Oppenheimer is today seen as a pivotal figure in the 20th century evolution of science and government. He was noted for his mastery of the scientific aspects of the Manhattan Project and for his management of the sensitive interaction between scientists and the military. Oppenheimer was involved in most aspects of the Project from recruiting scientists, many his former students, to helping engineers purify uranium. While today some may look backward on his contributions to the Project through the lens of his postwar political fallout, Oppenheimer remains a key figure for understanding the pivotal nexus for the Project’s quick and effective conclusion: a statesmen and a scientist rolled into one. Bridging together the divides between military, political and scientific leadership as Groves and Oppenheimer achieved, is a critical element of the success of the Manhattan Project. 3 The parallels to the threat of climate change are striking. In many ways the challenges of building technology to manage the impending doom of climate change mirror those of the construction of the atomic bomb. While the scales and natures of these individual threats belie detailed comparison, the organizational structure of the urgency to combat global climate catastrophe exhibits some parallels to the threat of the Axis powers acquiring the bomb before the Allied states. Most commentators agree that the threats of war and the atomic arms race were the driving forces for the indefatigable push for the Manhattan Project. Similarly, the certainty of the threats of climate change provides impetus for the exigency of carbon emissions reducing technology. It serves as a rallying point for the scientific community to join hands together with the business, non-governmental and international communities to ward off the negative impact of climate change. While many parallels between the two projects function well enough, some aspects of the analogy merit caution. The greatest difficulty in pursuing the Manhattan Project comparison is the choosing of technology. When the Manhattan Project itself was set running in 1942, the technological pursuit—nuclear bombs—was already fixed. The project was not set up to find new technologies but to reach the more limited goal of how to make a specific technology work. Without that certainty, we may quickly get bogged down into what some skeptics on the need for a Manhattan Project for climate change suggest amounts to government interference with market mechanisms for technological innovation. However, a well-harrowed area of development economics proposes correcting inefficient technologies with “big push” technologies. The Manhattan Project rationale extends this basic principle only to a larger scale for greening economic growth. Some ethical problems, nevertheless, abound with the comparison to the production of the most potent weapon of war known to mankind. Even in the specific case of climate change science, post-WWII government funding for climatological warfare spurred the rise of scientific knowledge on climate change, when questions such as how to unleash a devastating storm unto one’s military enemies were posed. The issue, however, of finding cleaner energy for carbon emissions reduction jettisons these ethical warfare troubles. Other difficulties give greater cause for caution with the analogy to the Manhattan Project. One, for instance, moving beyond the potential irony, would be the immense task of cleaning up the environmental remains of such a large-scale project, as troubles proliferate till today with the mop up after the Manhattan Project and decades of nuclear weaponry production. The Hanford Site in Washington State, for example, displaced several farming communities. But the details of the search for cleaner energy technology cause the analogy to hiccup: the multiple sites requiring clean up are due to the toxic nature of atomic energy; these worries are not credible ones for the question of a Climate Change Manhattan Project. Another spot where the comparison must depart from the Manhattan Project is the secrecy with which the original was undertaken, given the security concerns over the latent power of the atomic bomb. This would need to be done away with in the efforts of new energy technology towards a broader fulfillment of rights to intellectual property consistent with the need to combat climate change. The benefits 4 of cleaner technology belie the heart of the moral problematic of the first Manhattan Project; the dangers of nuclear war and the clean up costs, in social and economic hazardous terms, do not exist. Some will suggest that calling for a new Climate Change Manhattan Project distracts attention from carbon emissions mitigations strategies, betraying a cornucopian view of human ability—the answer to the carbon emissions problem, they argue, does not lie in the search for new technology. For these skeptics, pursuit of a Climate Change Manhattan Project will at best only fill the fluff of castles built in the skies, and at worst raise and dash hopes at once. Yet it is clear enough that the Kyoto emissions targets cannot be led by mitigation alone, technological innovation has become essential to meet the challenge. Recent research and political movement in the fields of innovation in and access to medical drugs provide at least one powerful anchor for how to strategize development of low-carbon technology. The current intellectual property rights (IPR) regime, as enshrined in the 1995 World Trade Organization’s Trade-related Intellectual Property Rights (TRIPS) agreement, many increasingly argue, fails on both efficiency and equity grounds to incentivize drug innovation for the world’s poor. Over the last several years, a flurry of analysis has unfurled a growing body of proposals to reform the TRIPS regime, crystallizing the need to develop economically and ethically grounded principles on which to stand a new global deal for advancing public health and access to essential medicines. An overlapping consensus centers on prize funds for medical innovation. One set of significant proposals includes rewarding drug and pharmaceutical researchers for innovation based on the actual impact on the global burden of disease: each increase in a year of healthy life lived receives a proportional increment in financial reward. The same concept may be fruitfully applied to incentivizing technological innovation for lowcarbon economic growth and human lifestyle. Similarly then, a prize fund can be constructed to incentivize the development of lowcarbon technology, including carbon storage and sequestration, as well as technology transfer to developing countries, especially China and India. A key challenge hampering this policy in medical drug innovation is the technical difficulty in translation human lives gained into a substantive financial amount. This, however, does not riddle the proposal for a low-carbon innovation fund: the measurements for carbon and impact already exist. The carbon prices developed in carbon taxation and cap-and-trade schemes, building on – although going beyond – some of the groundwork already accomplished by the European Union’s Emissions Trading Scheme, constitutes work needed in tandem with this proposal. All the market and public policy tools available must be employed at once to meet the challenge of what some call the greatest and widest-ranging market failure, ever. The Manhattan Project accorded the world a new view of science, reaching what was perhaps its zenith in the popular imagination in the 1969 Apollo landing on the moon. President John F. Kennedy stirred the American people and the world at large with references to the successes of the Manhattan Project. The contours and content of a 5 significant push for technology—following the conversion of political will into financial capital, scientific expertise united to combat a unified threat, and scientific and administrative leadership—are obviously desirably replicable. The hope will be that a new Climate Change Manhattan Project will surpass the vision and achievement of the first Manhattan Project. Instead of dividing nations via technological saber rattling, it would be a force tying humanity together. Instead of the perverse effect of bringing the world to the brink of foremost anthropogenic interference—a global nuclear disaster, despite the power of atomic energy and benefits—a new Climate Change Manhattan Project could pave the way for greater prosperity and sustainable development. The new Climate Change Manhattan Project could replace the atomic project as a greater exemplar of the opportunities of human achievement. It could be the new inspiration from which future generations draw impetus to tackle the unforeseen problems of their times, and to meet the further challenges of science.

#### Unforeseen problems cause extinction having a sufficient technological base is key

Bostrom, 12 [Nick, We're Underestimating the Risk of Human Extinction

Professor Oxford, March, http://www.theatlantic.com/technology/archive/2012/03/could-people-go-extinct/253821/]

 Unthinkable as it may be, humanity, every last person, could someday be wiped from the face of the Earth. We have learned to worry about asteroids and supervolcanoes, but the more-likely scenario, according to Nick Bostrom, a professor of philosophy at Oxford, is that we humans will destroy ourselves. Bostrom, who directs Oxford's Future of Humanity Institute, has argued [over the course of several papers](http://www.fhi.ox.ac.uk/) that human extinction risks are poorly understood and, worse still, severely underestimated by society. Some of these existential risks are fairly well known, especially the natural ones. But others are obscure or even exotic. Most worrying to Bostrom is the subset of existential risks that arise from human technology, a subset that he expects to grow in number and potency over the next century. Despite his concerns about the risks posed to humans by technological progress, Bostrom is no luddite. In fact, he is a longtime advocate of transhumanism---the effort to improve the human condition, and even human nature itself, through technological means. In the long run he sees technology as a bridge, a bridge we humans must cross with great care, in order to reach new and better modes of being. In his work, Bostrom uses the tools of philosophy and mathematics, in particular probability theory, to try and determine how we as a species might achieve this safe passage. What follows is my conversation with Bostrom about some of the most interesting and worrying existential risks that humanity might encounter in the decades and centuries to come, and about what we can do to make sure we outlast them. Some have argued that we ought to be directing our resources toward humanity's existing problems, rather than future existential risks, because many of the latter are highly improbable. You have responded by suggesting that existential risk mitigation may in fact be a dominant moral priority over the alleviation of present suffering. Can you explain why? Bostrom: Well suppose you have a moral view that counts future people as being worth as much as present people. You might say that fundamentally it doesn't matter whether someone exists at the current time or at some future time, just as many people think that from a fundamental moral point of view, it doesn't matter where somebody is spatially---somebody isn't automatically worth less because you move them to the moon or to Africa or something. A human life is a human life. If you have that moral point of view that future generations matter in proportion to their population numbers, then you get this very stark implication that existential risk mitigation has a much higher utility than pretty much anything else that you could do. There are so many people that could come into existence in the future if humanity survives this critical period of time---we might live for billions of years, our descendants might colonize billions of solar systems, and there could be billions and billions times more people than exist currently. Therefore, even a very small reduction in the probability of realizing this enormous good will tend to outweigh even immense benefits like eliminating poverty or curing malaria, which would be tremendous under ordinary standards. In the short term you don't seem especially worried about existential risks that originate in nature like asteroid strikes, supervolcanoes and so forth. Instead you have argued that the majority of future existential risks to humanity are anthropogenic, meaning that they arise from human activity. Nuclear war springs to mind as an obvious example of this kind of risk, but that's been with us for some time now. What are some of the more futuristic or counterintuitive ways that we might bring about our own extinction? Bostrom: I think the biggest existential risks relate to certain future technological capabilities that we might develop, perhaps later this century. For example, machine intelligence or advanced molecular nanotechnology could lead to the development of certain kinds of weapons systems. You could also have risks associated with certain advancements in synthetic biology. Of course there are also existential risks that are not extinction risks. The concept of an existential risk certainly includes extinction, but it also includes risks that could permanently destroy our potential for desirable human development. One could imagine certain scenarios where there might be a permanent global totalitarian dystopia. Once again that's related to the possibility of the development of technologies that could make it a lot easier for oppressive regimes to weed out dissidents or to perform surveillance on their populations, so that you could have a permanently stable tyranny, rather than the ones we have seen throughout history, which have eventually been overthrown. And why shouldn't we be as worried about natural existential risks in the short term? Bostrom: One way of making that argument is to say that we've survived for over 100 thousand years, so it seems prima facie unlikely that any natural existential risks would do us in here in the short term, in the next hundred years for instance. Whereas, by contrast we are going to introduce entirely new risk factors in this century through our technological innovations and we don't have any track record of surviving those. Now another way of arriving at this is to look at these particular risks from nature and to notice that the probability of them occurring is small. For instance we can estimate asteroid risks by looking at the distribution of craters that we find on Earth or on the moon in order to give us an idea of how frequent impacts of certain magnitudes are, and they seem to indicate that the risk there is quite small. We can also study asteroids through telescopes and see if any are on a collision course with Earth, and so far we haven't found any large asteroids on a collision course with Earth and we have looked at the majority of the big ones already. You have argued that we underrate existential risks because of a particular kind of bias called observation selection effect. Can you explain a bit more about that? Bostrom: The idea of an observation selection effect is maybe best explained by first considering the simpler concept of a selection effect. Let's say you're trying to estimate how large the largest fish in a given pond is, and you use a net to catch a hundred fish and the biggest fish you find is three inches long. You might be tempted to infer that the biggest fish in this pond is not much bigger than three inches, because you've caught a hundred of them and none of them are bigger than three inches. But if it turns out that your net could only catch fish up to a certain length, then the measuring instrument that you used would introduce a selection effect: it would only select from a subset of the domain you were trying to sample. Now that's a kind of standard fact of statistics, and there are methods for trying to correct for it and you obviously have to take that into account when considering the fish distribution in your pond. An observation selection effect is a selection effect introduced not by limitations in our measurement instrument, but rather by the fact that all observations require the existence of an observer. This becomes important, for instance, in evolutionary biology. For instance, we know that intelligent life evolved on Earth. Naively, one might think that this piece of evidence suggests that life is likely to evolve on most Earth-like planets. But that would be to overlook an observation selection effect. For no matter how small the proportion of all Earth-like planets that evolve intelligent life, we will find ourselves on a planet that did. Our data point-that intelligent life arose on our planet-is predicted equally well by the hypothesis that intelligent life is very improbable even on Earth-like planets as by the hypothesis that intelligent life is highly probable on Earth-like planets. When it comes to human extinction and existential risk, there are certain controversial ways that observation selection effects might be relevant. How so? Bostrom: Well, one principle for how to reason when there are these observation selection effects is called the self-sampling assumption, which says roughly that you should think of yourself as if you were a randomly selected observer of some larger reference class of observers. This assumption has a particular application to thinking about the future through the doomsday argument, which attempts to show that we have systematically underestimated the probability that the human species will perish relatively soon. The basic idea involves comparing two different hypotheses about how long the human species will last in terms of how many total people have existed and will come to exist. You could for instance have two hypothesis: to pick an easy example imagine that one hypothesis is that a total of 200 billion humans will have ever existed at the end of time, and the other hypothesis is that 200 trillion humans will have ever existed. Let's say that initially you think that each of these hypotheses is equally likely, you then have to take into account the self-sampling assumption and your own birth rank, your position in the sequence of people who have lived and who will ever live. We estimate currently that there have, to date, been 100 billion humans. Taking that into account, you then get a probability shift in favor of the smaller hypothesis, the hypothesis that only 200 billion humans will ever have existed. That's because you have to reason that if you are a random sample of all the people who will ever have existed, the chance that you will come up with a birth rank of 100 billion is much larger if there are only 200 billion in total than if there are 200 trillion in total. If there are going to be 200 billion total human beings, then as the 100 billionth of those human beings, I am somewhere in the middle, which is not so surprising. But if there are going to be 200 trillion people eventually, then you might think that it's sort of surprising that you're among the earliest 0.05% of the people who will ever exist. So you can see how reasoning with an observation selection effect can have these surprising and counterintuitive results. Now I want to emphasize that I'm not at all sure this kind of argument is valid; there are some deep methodological questions about this argument that haven't been resolved, questions that I have written a lot about. See I had understood observation selection effects in this context to work somewhat differently. I had thought that it had more to do with trying to observe the kinds of events that might cause extinction level events, things that by their nature would not be the sort of things that you could have observed before, because you'd cease to exist after the initial observation. Is there a line of thinking to that effect? Bostrom: Well, there's another line of thinking that's very similar to what you're describing that speaks to how much weight we should give to our track record of survival. Human beings have been around for roughly a hundred thousand years on this planet, so how much should that count in determining whether we're going to be around another hundred thousand years? Now there are a number of different factors that come into that discussion, the most important of which is whether there are going to be new kinds of risks that haven't existed to this point in human history---in particular risks of our own making, new technologies that we might develop this century, those that might give us the means to create new kinds of weapons or new kinds of accidents. The fact that we've been around for a hundred thousand years wouldn't give us much confidence with respect to those risks. But, to the extent that one were focusing on risks from nature, from asteroid attacks or risks from say vacuum decay in space itself, or something like that, one might ask what we can infer from this long track record of survival. And one might think that any species anywhere will think of themselves as having survived up to the current time because of this observation selection effect. You don't observe yourself after you've gone extinct, and so that complicates the analysis for certain kinds of risks. A few years ago I wrote a paper together with a physicist at MIT named Max Tegmark, where we looked at particular risks like vacuum decay, which is this hypothetical phenomena where space decays into a lower energy state, which would then cause this bubble propagating at the speed of light that would destroy all structures in its path, and would cause a catastrophe that no observer could ever see because it would come at you at the speed of light, without warning. We were noting that it's somewhat problematic to apply our observations to develop a probability for something like that, given this observation selection effect. But we found an indirect way of looking at evidence having to do with the formation date of our planet, and comparing it to the formation date of other earthlike planets and then using that as a kind of indirect way of putting a bound on that kind of risk. So that's another way in which observation selection effects become important when you're trying to estimate the odds of humanity having a long future. Nick Bostrom is the director of the Future of Humanity Institute at Oxford. One possible strategic response to human-created risks is the slowing or halting of our technological evolution, but you have been a critic of that view, arguing that the permanent failure to develop advanced technology would itself constitute an existential risk. Why is that? Bostrom: Well, again I think the definition of an existential risk goes beyond just extinction, in that it also includes the permanent destruction of our potential for desirable future development. Our permanent failure to develop the sort of technologies that would fundamentally improve the quality of human life would count as an existential catastrophe. I think there are vastly better ways of being than we humans can currently reach and experience. We have fundamental biological limitations, which limit the kinds of values that we can instantiate in our life---our lifespans are limited, our cognitive abilities are limited, our emotional constitution is such that even under very good conditions we might not be completely happy. And even at the more mundane level, the world today contains a lot of avoidable misery and suffering and poverty and disease, and I think the world could be a lot better, both in the transhuman way, but also in this more economic way. The failure to ever realize those much better modes of being would count as an existential risk if it were permanent. Another reason I haven't emphasized or advocated the retardation of technological progress as a means of mitigating existential risk is that it's a very hard lever to pull. There are so many strong forces pushing for scientific and technological progress in so many different domains---there are economic pressures, there is curiosity, there are all kinds of institutions and individuals that are invested in technology, so shutting it down is a very hard thing to do. What technology, or potential technology, worries you the most? Bostrom: Well, I can mention a few. In the nearer term I think various developments in biotechnology and synthetic biology are quite disconcerting. We are gaining the ability to create designer pathogens and there are these blueprints of various disease organisms that are in the public domain---you can download the gene sequence for smallpox or the 1918 flu virus from the Internet. So far the ordinary person will only have a digital representation of it on their computer screen, but we're also developing better and better DNA synthesis machines, which are machines that can take one of these digital blueprints as an input, and then print out the actual RNA string or DNA string. Soon they will become powerful enough that they can actually print out these kinds of viruses. So already there you have a kind of predictable risk, and then once you can start modifying these organisms in certain kinds of ways, there is a whole additional frontier of danger that you can foresee. In the longer run, I think artificial intelligence---once it gains human and then superhuman capabilities---will present us with a major risk area. There are also different kinds of population control that worry me, things like surveillance and psychological manipulation pharmaceuticals. In one of your papers on this topic you note that experts have estimated our total existential risk for this century to be somewhere around 10-20%. I know I can't be alone in thinking that is high. What's driving that? Bostrom: I think what's driving it is the sense that humans are developing these very potent capabilities---we are doing unprecedented things, and there is a risk that something could go wrong. Even with nuclear weapons, if you rewind the tape you notice that it turned out that in order to make a nuclear weapon you had to have these very rare raw materials like highly enriched uranium or plutonium, which are very difficult to get. But suppose it had turned out that there was some technological technique that allowed you to make a nuclear weapon by baking sand in a microwave oven or something like that. If it had turned out that way then where would we be now? Presumably once that discovery had been made civilization would have been doomed. Each time we make one of these new discoveries we are putting our hand into a big urn of balls and pulling up a new ball---so far we've pulled up white balls and grey balls, but maybe next time we will pull out a black ball, a discovery that spells disaster. At the moment we have no good way of putting the ball back into the urn if we don't like it. Once a discovery has been published there is no way of un-publishing it. Even with nuclear weapons there were close calls. According to some people we came quite close to all out nuclear war and that was only in the first few decades of having discovered the new technology, and again it's a technology that only a few large states had, and that requires a lot of resources to control---individuals can't really have a nuclear arsenal. Can you explain the simulation argument, and how it presents a very particular existential risk? Bostrom: The simulation argument addresses whether we are in fact living in a simulation as opposed to some basement level physical reality. It tries to show that at least one of three propositions is true, but it doesn't tell us which one. Those three are: 1) Almost all civilizations like ours go extinct before reaching technological maturity. 2) Almost all technologically mature civilizations lose interest in creating ancestor simulations: computer simulations detailed enough that the simulated minds within them would be conscious. 3) We're almost certainly living in a computer simulation. The full argument requires sophisticated probabilistic reasoning, but the basic argument is fairly easy to grasp without resorting to mathematics. Suppose that the first proposition is false, which would mean that some significant portion of civilizations at our stage eventually reach technological maturity. Suppose that the second proposition is also false, which would mean that some significant fraction of those (technologically mature) civilizations retain an interest in using some non-negligible fraction of their resources for the purpose of creating these ancestor simulations. You can then show that it would be possible for a technologically mature civilization to create astronomical numbers of these simulations. So if this significant fraction of civilizations made it through to this stage where they decided to use their capabilities to create these ancestor simulations, then there would be many more simulations created than there are original histories, meaning that almost all observers with our types of experiences would be living in simulations. Going back to the observation selection effect, if almost all kinds of observers with our kinds of experiences are living in simulations, then we should think that we are living in a simulation, that we are one of the typical observers, rather than one of the rare, exceptional basic level reality observers. The connection to existential risk is twofold. First, the first of those three possibilities, that almost all civilizations like ours go extinct before reaching technological maturity obviously bears directly on how much existential risk we face. If proposition 1 is true then the obvious implication is that we will succumb to an existential catastrophe before reaching technological maturity. The other relationship with existential risk has to do with proposition 3: if we are living in a computer simulation then there are certain exotic ways in which we might experience an existential catastrophe which we wouldn't fear if we are living in basement level physical reality. The simulation could be shut off, for instance. Or there might be other kinds of interventions in our simulated reality. Now that does seem to assume that a technologically mature civilization would have an interest in creating these simulations in the first place. To say that these civilizations might "lose interest" implies some interest to begin with. Bostrom: Right now there are certainly a lot of people that, if they could, would be very happy to do this for all kinds of reasons---people might do it as a sort of scientific study, they might do it for entertainment, for art. Already you have people building these virtual worlds in computer games, and the more realistic they can make them the happier they are. You could have people pursuing virtual historical tourism, or people who want to do this just because it could be done. So I think it's safe to say that people today, had they the capabilities, would do it, but perhaps with a certain level of technological maturity people may lose interest in this for one reason or another. Your work reminds me a little bit of the film 'Children of Men,' which depicted a very particular existential risk: species-wide infertility. What are some of the more novel treatments you've seen of this subject in mainstream culture? Bostrom: Well, the Hollywood renditions of existential risk scenarios are usually quite bad. For instance, the artificial intelligence risk is usually represented by an invasion of a robot army that is fought off by some muscular human hero wielding a machine gun or something like that. If we are going to go extinct because of artificial intelligence, it's not going to be because there's this battle between humans and robots with laser eyes. A lot of the stories you see in fiction or in films are subject to the good story bias; there are constraints on what makes for a good story. Usually there has to be a protagonist and the thing you're battling has to be evil, and there are going to be ups and downs, and the humans prevail in the end. So there's a filter for the scenarios that you're going to see in media representations. Aldous Huxley's Brave New World is interesting in that it created a vivid depiction of a scenario in which humans have been biologically and socially engineered to fit into a dystopian social structure, and it shows how that could be very bad. But on the whole I think the general point I would make is that there isn't a lot of good literature on existential risk, and that one needs to think of these things not in terms of vivid scenarios, but rather in more abstract terms. Last week I interviewed Cary Fowler with the [Svalbard Global Seed Vault](http://www.theatlantic.com/technology/archive/2012/02/after-4-years-checking-up-on-the-svalbard-global-seed-vault/253458/). His project is a technology that might be interpreted as looking to limit existential risk. Are there other technological (as opposed to social or political) solutions that you see on the horizon? Bostrom: Well there are things that one can do, some that would apply to particular risks and others that would apply to a broader spectrum of risk. With particular risks, for instance, one could invest in technologies to hasten the time it takes to develop a new vaccine, which would also be very valuable to have for other reasons unrelated to existential risk. With regard to existential risk stemming from artificial intelligence, there is some work that we are doing now to try and think about different ways of solving the control problem. If one day you have the ability to create a machine intelligence that is greater than human intelligence, how would you control it, how would you make sure it was human-friendly and safe? There is work that can be done there. With asteroids there has been this [Spaceguard](http://www.spaceguarduk.com/) project that maps out different asteroids and their trajectories, that project is certainly motivated by concerns about existential risks, and it costs only a couple of million dollars per year, with most of the funding coming from NASA. Then there are more general-purpose things you can do. You could imagine building some refuge, some bunker with a very large supply of food, where humans could survive for a decade or several decades if there were a large impact of some kind. It would be a lot cheaper and easier to do that on Earth than it would be to build a space colony, which some people have proposed. But to me the most important thing to do is more analysis, specifically analysis to identify the biggest existential risks and the types of interventions that would be most likely to mitigate those risks. A telescope used to track asteroids at the Spaceguard Centre in the United Kingdom. I noticed that you define an existential risk as potentially bringing about the premature extinction of Earth-originating intelligent life. I wondered what you mean by premature? What would count as a mature extinction? Bostrom: Well, you might think that an extinction occurring at the time of the heat death of the universe would be in some sense mature. There might be fundamental physical limits to how long information processing can continue in this universe of ours, and if we reached that level there would be extinction, but it would be the best possible scenario that could have been achieved. I wouldn't count that as an existential catastrophe, rather it would be a kind of success scenario. So it's not necessary to survive infinitely long, which after all might be physically impossible, in order to have successfully avoided existential risk. In considering the long-term development of humanity, do you put much stock in specific schemes like the [Kardashev Scale](http://en.wikipedia.org/wiki/Kardashev_scale), which plots the advancement of a civilization according to its ability to harness energy, specifically the energy of its planet, its star, and then finally the galaxy? Might there be more to human flourishing than just increasing mastery of energy sources? Bostrom: Certainly there would be more to human flourishing. In fact I don't even think that particular scale is very useful. There is a discontinuity between the stage where we are now, where we are harnessing a lot of the energy resources of our home planet, and a stage where we can harness the energy of some increasing fraction of the universe like a galaxy. There is no particular reason to think that we might reach some intermediate stage where we would harness the energy of one star like our sun. By the time we can do that I suspect we'll be able to engage in large-scale space colonization, to spread into the galaxy and then beyond, so I don't think harnessing the single star is a relevant step on the ladder. If I wanted some sort of scheme that laid out the stages of civilization, the period before machine super intelligence and the period after super machine intelligence would be a more relevant dichotomy. When you look at what's valuable or interesting in examining these stages, it's going to be what is done with these future resources and technologies, as opposed to their structure. It's possible that the long-term future of humanity, if things go well, would from the outside look very simple. You might have Earth at the center, and then you might have a growing sphere of technological infrastructure that expands in all directions at some significant fraction of the speed of light, occupying larger and larger volumes of the universe---first in our galaxy, and then beyond as far as is physically possible. And then all that ever happens is just this continued increase in the spherical volume of matter colonized by human descendants, a growing bubble of infrastructure. Everything would then depend on what was happening inside this infrastructure, what kinds of lives people were being led there, what kinds of experiences people were having. You couldn't infer that from the large-scale structure, so you'd have to sort of zoom in and see what kind of information processing occurred within this infrastructure. It's hard to know what that might look like, because our human experience might be just a small little crumb of what's possible. If you think of all the different modes of being, different kinds of feeling and experiencing, different ways of thinking and relating, it might be that human nature constrains us to a very narrow little corner of the space of possible modes of being. If we think of the space of possible modes of being as a large cathedral, then humanity in its current stage might be like a little cowering infant sitting in the corner of that cathedral having only the most limited sense of what is possible.

#### And, scope and centralized leadership makes federal investment necessary

Woolner, 11 [[David Woolner](http://www.newdeal20.org/author/david-woolner/) is a Senior Fellow and Hyde Park Resident Historian for the Roosevelt Institute, “Time for a New Manhattan Project?” http://www.nextnewdeal.net/time-new-manhattan-project]

In a [speech](http://www.youtube.com/watch?v=qfeKFulcPSM&feature=player_embedded) before students at George Washington University this week, President Obama insisted that it was time for the United States to develop a new national energy policy that would reduce our nation's dependence on oil. "We've known about the dangers of our oil dependence for decades," he said, with presidents and politicians having promised time and time again to secure America's "energy dependence." But so far, "that promise has gone unmet." He then went on to say that we "cannot keep going from shock to trance on the issue of energy security, rushing to propose action when gas prices rise, then hitting the snooze button when they fall again." To solve our energy challenge, the president then announced that his administration was releasing a "[Blueprint for a Secure Energy Future](http://www.whitehouse.gov/blog/2011/03/30/obama-administration-s-blueprint-secure-energy-future)," which provides the framework for a comprehensive national energy policy. The new framework includes a number of ideas and programs, from setting a goal to cut our dependence on foreign oil by one third over the next decade, to ensuring America's homes and offices are more energy efficient. The plan also calls for an enhanced effort to secure domestic supplies of energy -- including oil, natural gas, clean coal and nuclear power -- as well as the development of alternative sources of energy, such as wind, solar power and biofuels. In the long run, however, the president insisted that the best way for the United States to secure its energy future would be for the country to tap into its most valuable commodity: American ingenuity. The notion that the United States can use its scientific, intellectual and entrepreneurial power to solve its most complex and pressing problems is not a new one. But to a large extent, President Obama's call for the research and development of new sources of energy relies on the encouragement of the private sector to do so through the establishment of a Clean Energy Standard. He does observe that government funding in R&D will be critical to this effort and notes with pride the investments his administration has already made in renewable energy research under funds provided by the 2009 stimulus act. But his calls for additional federal support of this effort -- characterized as one of his "budget priorities" in an age of fiscal austerity -- may lack the dynamism and inspiration needed to get the American people behind it. It is true that the Americans are remarkably ingenious. But it is also true that some of our most important technical and scientific advancements have come about not through the profit-seeking initiative of the private sector, but rather through the marshaling of intellectual, scientific and financial resources under the direction of the federal government. One example is the creation of the National Aeronautics and Space Administration (NASA), established by Congress in 1958 under the leadership of President Dwight David Eisenhower. A second, and far more significant example, can be found in the launch of FDR's [Manhattan Project](http://en.wikipedia.org/wiki/Manhattan_Project) -- the wartime effort to develop the atomic bomb. [Sign up to have the Daily Digest, a witty take on the morning’s most important headlines, delivered straight to your inbox.](http://rooseveltinstitute.us1.list-manage2.com/subscribe?u=5044841afea7ba83dc11db61f&id=e4428ba350) The Manhattan Project was inspired to a large extent by a letter that President Roosevelt received in the fall of 1939 from Albert Einstein and a small group of international scientists. The letter took note of the recent discovery of nuclear fission and warned the president of the possibility that this discovery might lead to the creation of extremely powerful weapons. It also alluded to the fact that German scientists were working in this area. In response to this news, FDR immediately established an Advisory Committee on Uranium, while a similar effort was launched in Great Britain. By 1942, the two efforts had merged into what was called the Manhattan Project. Centered in the United States, it involved scientists working at labs in a number of leading universities in the U.S., Britain and Canada. It also led to the creation of a number of significant federal facilities, such as the Oak Ridge National Laboratory and Oak Ridge City, which grew from empty Tennessee farmland to a city and scientific facility of over 75,000 people between 1943 and 1945; the Hanford Engineering Works, located in south-central Washington, which employed over 50,000 workers in the construction of the world's first full-scale nuclear reactor; and the Los Alamos National Laboratory, which employed over 5,000 scientists and engineers. Employing more than 130,000 people at a cost of roughly $2 billion in 1940s dollars, the Manhattan Project was one of the largest scientific endeavors ever undertaken. Its successful development of atomic weapons and the US decision to use them will forever remain controversial, but the project also ushered in the nuclear age, which brought us a host of scientific advances above and beyond the development of nuclear energy. These include significant developments in medicine, electronics and nanotechnology, all of which have had an enormous impact on our quality of life and our understandings of the workings of the universe. Establishing a [Clean Energy Standard](http://www.washingtonpost.com/blogs/ezra-klein/post/what-a-clean-energy-standard-is-and-why-were-talking-about-it/2011/03/10/AFuTzMBC_blog.html) that will require the private sector to reduce our greenhouse gas emissions and our dependence on foreign oil is an important first step in our effort to secure what the president calls our "energy independence." But if we wish to use our innate ingenuity to truly wean ourselves off our dependence on fossil fuels and the internal combustion engine, then something more than marginal support for basic scientific and technical research will be required. President Obama alluded to this when he said we need "to dream big;" to summon the same spirit of unbridled optimism and bold willingness that allowed "previous generations to rise to greatness -- to save democracy, to touch the moon, to connect the world with our own science and imagination." As we look to the past for inspiration, it is important to remember that many of the accomplishments the president refers to would not have been achieved without the strong financial support of the federal government. To "dream big" means trying to achieve not the greatest profit, but the greatest good for all Americans. This requires much more than faith in science; it also requires faith in our collective wisdom and the benefits that can accrue from a government that is truly dedicated to the common good of all.

#### And, centralized leadership is the only means of fast deployment

Alexander, 08 [Lamar Alexander is the senior U.S. senator from Tennessee and chair of the Senate Republican Conference. He served as Tennessee’s governor from 1979 to 1987 and as U.S. Secretary of Education from 1991 to 1993. Tennessee’s Business | BERC, A New Manhattan Project for Clean Energy Independence, <http://frank.mtsu.edu/~berc/tnbiz/economy/pdfs/alexander.pdf>]

In addition to the need to meet an overwhelming challenge, other characteristics of the original Manhattan Project are suited to this new challenge: It needs to proceed as fast as possible along several tracks to reach the goal. According to Don Gillespie, a young engineer at Los Alamos during World War II, the “entire project was being conducted using a shotgun approach, trying all possible approaches simultaneously, without regard to cost, to speed toward a conclusion.” It needs presidential focus and bipartisan support in Congress. It needs the kind of centralized, gruff leadership that General Leslie R. Groves of the Army Corps of Engineers gave the first Manhattan Project. It needs to “break the mold.” To borrow the words of Dr. J. Robert Oppenheimer in a speech to Los Alamos scientists in November of 1945, the challenge of clean energy independence is “too revolutionary to consider in the framework of old ideas.”

And, federal guidance for nuclear expansion is the sole conduit for coordination with federal labs – solves tech deployment

ORNL, 08 [Oak Ridge National Labs News Letter, Manhattan Project for Clean Energy Independence”, <http://www.ornl.gov/info/ornlreview/v41_2_08/article02.shtml>]

Dana Christensen, ORNL's associate laboratory director for energy and engineering sciences, emphasized the importance of closing the fuel cycle to enable the expansion of carbon-free nuclear energy in the United States. "By independence I do not mean that the United States would never buy oil from Mexico or Canada or Saudi Arabia," Alexander said. "By independence I do mean that the United States could never be held hostage by any country for our energy supplies." During the discussion that led to the passage of the America COMPETES Act of 2007, the senator noted several participants suggested that "focusing on energy independence would force the kind of investments in the physical sciences and research that the United States needs to maintain its competitiveness." The growing demand for oil worldwide and corn-fed ethanol in the United States is driving up gasoline and food prices, motivating the public to address the availability and cost of energy with a greater sense of urgency. This challenge comes as Americans are increasingly aware that burning more coal for electricity is contributing to sustained global warming. Alexander noted that characteristics of the Manhattan Project 65 years ago could be applied to the current initiative for clean energy independence. Foremost is the urgent need to proceed quickly along several tracks toward a common goal. Alexander added that long-term success would also require Presidential leadership and bipartisan support from Congress. Alexander said a contemporary Manhattan Project for energy should undertake "seven grand challenges" that would put America on the path toward clean energy independence within a generation. Alexander's seven grand challenges are: 1. Make plug-in hybrid vehicles commonplace 2. Make carbon capture and storage a reality for coal-burning power plants 3. Make solar power cost competitive with power from fossil fuels 4. Safely reprocess and store nuclear waste 5. Make advanced biofuels cost-competitive with gasoline 6. Make new buildings green buildings by using known technologies to reduce energy waste 7. Provide energy from fusion "Despite 'the gathering storm' of concern about American competitiveness, no other country approaches our brainpower advantage—the collection of research universities, national laboratories and private-sector companies we have," Alexander said. "And this is still the only country where people say with a straight face that anything is possible—and really believe it." Alexander's comments were echoed by Congressman Wamp, who asserted that nuclear power—if managed safely and efficiently—holds a key to the region's ability to provide adequate energy in a way that does not contribute to carbon emissions. Wamp stressed his belief that Oak Ridge, as it did once before, will play a key role in developing new technologies to increase America's security. Congressman Gordon stressed the need to fund the Advanced Research Projects Agency—Energy (ARPA-E), an agency modeled after the Department of Defense's DARPA that will provide aggressive funding for innovative research projects carried out by science and technology experts from industry, universities and federal laboratories. Gordon believes the program will give researchers unprecedented flexibility and resources to develop new technologies through high-risk, high-return research that can provide breakthroughs to meet the nation's most pressing energy challenges. ORNL Director Mason said the original Manhattan Project, which spent 60% of its $2 billion in Oak Ridge, illustrated the importance of parallel paths of research to determine which approaches work best and which simply do not work.

#### And, that solves science diplomacy

Pritchard, 10 [[Ambrose Evans-Pritchard](http://www.telegraph.co.uk/finance/comment/ambroseevans_pritchard/), International Business Editor, “Obama could kill fossil fuels overnight with a nuclear dash for thorium”, http://www.telegraph.co.uk/finance/comment/7970619/Obama-could-kill-fossil-fuels-overnight-with-a-nuclear-dash-for-thorium.html

Roosevelt initially fobbed him off. He listened more closely at a second meeting over breakfast the next day, then made up his mind within minutes. "This needs action," he told his military aide. It was the birth of the Manhattan Project. As a result, the US had an atomic weapon early enough to deter Stalin from going too far in Europe. The global energy crunch needs equal "action". If it works, Manhattan II could restore American optimism and strategic leadership at a stroke: if not, it is a boost for US science and surely a more fruitful way to pull the US out of perma-slump than scattershot stimulus.

#### Nuke power key – independently solves war

BRC 12—The Reactor and Fuel Cycle Technology Subcommittee of the Blue Ribbon Commission on America’s Nuclear Future; co-chaired by the Honorable Pete Domenici and Dr. Per Peterson and included the following Commissioners:  Dr. Albert Carnesale, Susan Eisenhower, Dr. Allison MacFarlane, Dr. Richard  Meserve, Dr. Ernest Moniz, and the Honorable Phil Sharp. (Reactor and Fuel Cycle Technology SubcommitteeReport to the Full Commission, cybercemetery.unt.edu/archive/brc/20120620220054/http://brc.gov/sites/default/files/documents/updated\_rfct\_report\_final.pdf

In contrast, there is much less uncertainty about the underlying energy and nuclear technology challenges we face in the next few decades. Even in the aftermath of the Fukushima incident, which has caused some rethinking about reactor safety issues, there is far more consensus, reflected in comments on the Subcommittee’s draft report, about what would constitute desirable outcomes. The safety, cost, resource utilization and sustainability, security and nonproliferation, and waste management of nuclear energy systems are sure to remain paramount concerns that—together with broader questions of public acceptance and overall competitiveness with other energy resources—will be key to the nuclear industry’s long-term prospects, not only in the United States but worldwide. Looking beyond nuclear power to the larger set of energy issues, the challenges are well-identified and even more daunting. At a global level, the central question is how to reconcile overall energy demand, including rapidly rising energy consumption in the developing world, with emerging environmental and resource constraints and without impeding economic development, exacerbating geopolitical tensions, or increasing the potential for national and regional conflicts. At a national level, the challenge for the United States is to position itself to meet future energy needs in ways that are also congruent with re-establishing and sustaining a vigorous domestic economy, maintaining global technological and scientific leadership, protecting public health and the environment, mitigating the impacts of climate change, and reducing energy-related national security risks and terrorism threats.

#### And, deescalates every transnational threat

Fertel 11—35 years of experience consulting for electric utilities on issues related to designing, siting, licensing and managing both fossil and nuclear plants. Worked in executive positions with such organizations as Ebasco, Management Analysis Company and Tenera. In November 1990, he joined the U.S. Council for Energy Awareness as vice president of Technical Programs (Marvin, Measured Reactions Warranted, http:~/~/energy.nationaljournal.com/2011/07/[php)](http://68.233.253.124/xwiki/bin/create///energy.nationaljournal.com/2011/07/should-america-follow-europes/php%29?parent=Northwestern.Kirshon%2DMiles+Aff)

The strength of America’s energy portfolio is the diversity of supply that is the result of diverse natural resources and technology leadership. While countries like France and Japan have limited energy options, our nation has myriad options at hand. Despite this, we have been challenged to define a long-term energy policy that takes full advantage of our domestic resources and technological leadership to make us more energy independent. We should continue to learn from international experience in energy and foster global relationships that will enhance issues that are inextricably linked to energy—issues such as environmental preservation, economic growth, eradication of poverty, expanding access to clean water and transforming our transportation sector. But we should take a measured approach to global events based on what’s right for America. Nuclear energy development is one such area. For more than a half-century, nuclear energy has been a source of safe, carbon-free electricity. Here in America, 104 nuclear plants provide 20 percent of the nation’s electricity. Contrary to the premise of this week’s question, nearly half of the U.S. nuclear energy facilities producing electricity today have come on line in the past 30 years, including the most recent in 1996. The United States produces more electricity at nuclear energy plants than France and Japan combined—and operates about one-quarter of all commercial reactors in the world. U.S. companies invented this technology and we continue to set the gold standard globally—both in technology and in the development of a regulatory system that ensures oversight of safety and security at the facilities. In planning its energy future, every nation must consider the energy resources and technologies that are available to achieve its energy and environmental goals. As is the case in Germany and Italy with nuclear energy, political forces are the overriding factor in a country’s energy decisions despite more significant societal benefits that accrue to their citizens. Like many, economist Ferdinand Banks questions whether the nuclear energy phaseout in Germany will stand the test of time. He writes: “It needs to be appreciated that if the German nuclear retreat were a reality instead of a politically motivated and bizarre fantasy, the French nuclear sector might have already started to expand in order to receive the hundreds of billions in export income that would become available when German nuclear facilities begin to close their doors.” Today’s energy landscape is complex and no energy source is free of blemishes. Moreover, many are concerned about the absence of a sustained energy research and development program that will lead to the next big discoveries in energy. Absent these, it is clear we need to use energy efficiency and all available clean energy resources, including renewable sources and nuclear energy, to enhance our energy independence, protect the environment and meet the 24 percent increase in electricity demand by 2035. This approach is supported by the National Academies of Science, U.S. Department of Energy, International Energy Agency, Intergovernmental Panel on Climate Change and the Electric Power Research Institute. President Obama and bipartisan leaders in the Congress, support both the development of renewable energy sources and the expansion of safe, carbon-free nuclear energy. Despite the accident in Japan in March, citizens that live closest to America’s nuclear energy facilities support them the strongest. Eighty percent favor the use of the nuclear energy in a June survey by Bisconti Research and 83% gave the reactor nearest to where they live high safety ratings. Recent events in Japan confirm that safety must be the top priority of any nation utilizing nuclear energy. The U.S. nuclear industry and independent regulators at the Nuclear Regulatory Commission continue to triple check the safety of all reactors and will ensure that the lessons learned in Japan will be applied here. In this way, employing international experience to American facilities is invaluable. These measures far exceed the so-called “stress tests” that European reactors are undertaking over the coming months. Our total commitment to safety demands that every U.S. nuclear facility is fully prepared to effectively respond to the most extraordinary natural and man-made events. Continuous improvement means we exceed government regulations, not just meet them. There are many international forums where policymakers, regulators and energy executives share policy, technology and regulatory insights. They are valuable exchanges for building the energy platform that will power the world into the 21st Century while protecting the environment and enhancing the standard of living for all. Rather than emulating isolated, policy positions, these collaborative forums will produce common-sense energy strategies that stand the test of time.

#### Science diplomacy solves every extinction risk

**Fedoroff, 08 -** Science and Technology Adviser to the Secretary of State and the Administrator of USAID (Nina, Testimony Before the House Science Subcommittee on Research and Science Education, 4/2, <http://www.state.gov/g/oes/rls/rm/102996.htm>

Science by its nature facilitates diplomacy because it strengthens political relationships, embodies powerful ideals, and creates opportunities for all. The global scientific community embraces principles Americans cherish: transparency, meritocracy, accountability, the objective evaluation of evidence, and broad and frequently democratic participation. Science is inherently democratic, respecting evidence and truth above all.

Science is also a common global language, able to bridge deep political and religious divides. Scientists share a common language. Scientific interactions serve to keep open lines of communication and cultural understanding. As scientists everywhere have a common evidentiary external reference system, members of ideologically divergent societies can use the common language of science to cooperatively address both domestic and the increasingly trans-national and global problems confronting humanity in the 21st century. There is a growing recognition that science and technology will increasingly drive the successful economies of the 21st century.

Science and technology provide an immeasurable benefit to the U.S. by bringing scientists and students here, especially from developing countries, where they see democracy in action, make friends in the international scientific community, become familiar with American technology, and contribute to the U.S. and global economy. For example, in 2005, over 50% of physical science and engineering graduate students and postdoctoral researchers trained in the U.S. have been foreign nationals. Moreover, many foreign-born scientists who were educated and have worked in the U.S. eventually progress in their careers to hold influential positions in ministries and institutions both in this country and in their home countries. They also contribute to U.S. scientific and technologic development: According to the National Science Board’s 2008 Science and Engineering Indicators, 47% of full-time doctoral science and engineering faculty in U.S. research institutions were foreign-born.

Finally, some types of science – particularly those that address the grand challenges in science and technology – are inherently international in scope and collaborative by necessity. The ITER Project, an international fusion research and development collaboration, is a product of the thaw in superpower relations between Soviet President Mikhail Gorbachev and U.S. President Ronald Reagan. This reactor will harness the power of nuclear fusion as a possible new and viable energy source by bringing a star to earth. ITER serves as a symbol of international scientific cooperation among key scientific leaders in the developed and developing world – Japan, Korea, China, E.U., India, Russia, and United States – representing 70% of the world’s current population..

The recent elimination of funding for FY08 U.S. contributions to the ITER project comes at an inopportune time as the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project had entered into force only on October 2007. The elimination of the promised U.S. contribution drew our allies to question our commitment and credibility in international cooperative ventures. More problematically, it jeopardizes a platform for reaffirming U.S. relations with key states. It should be noted that even at the height of the cold war, the United States used science diplomacy as a means to maintain communications and avoid misunderstanding between the world’s two nuclear powers – the Soviet Union and the United States. In a complex multi-polar world, relations are more challenging, the threats perhaps greater, and the need for engagement more paramount.

*Using Science Diplomacy to Achieve National Security Objectives*

The welfare and stability of countries and regions in many parts of the globe require a concerted effort by the developed world to address the causal factors that render countries fragile and cause states to fail. Countries that are unable to defend their people against starvation, or fail to provide economic opportunity, are susceptible to extremist ideologies, autocratic rule, and abuses of human rights. As well, the world faces common threats, among them climate change, energy and water shortages, public health emergencies, environmental degradation, poverty, food insecurity, and religious extremism. These threats can undermine the national security of the United States, both directly and indirectly. Many are blind to political boundaries, becoming regional or global threats.

The United States has no monopoly on knowledge in a globalizing world and the scientific challenges facing humankind

are enormous. Addressing these common challenges demands common solutions and necessitates scientific cooperation, common standards, and common goals. We must increasingly harness the power of American ingenuity in science and technology through strong partnerships with the science community in both academia and the private sector, in the U.S. and abroad among our allies, to advance U.S. interests in foreign policy.

There are also important challenges to the ability of states to supply their populations with sufficient food. The still-growing human population, rising affluence in emerging economies, and other factors have combined to create unprecedented pressures on global prices of staples such as edible oils and grains. Encouraging and promoting the use of contemporary molecular techniques in crop improvement is an essential goal for US science diplomacy.

An essential part of the war on terrorism is a war of ideas. The creation of economic opportunity can do much more to combat the rise of fanaticism than can any weapon. The war of ideas is a war about rationalism as opposed to irrationalism. Science and technology put us firmly on the side of rationalism by providing ideas and opportunities that improve people’s lives. We may use the recognition and the goodwill that science still generates for the United States to achieve our diplomatic and developmental goals. Additionally, the Department continues to use science as a means to reduce the proliferation of the weapons’ of mass destruction and prevent what has been dubbed ‘brain drain’. Through cooperative threat reduction activities, former weapons scientists redirect their skills to participate in peaceful, collaborative international research in a large variety of scientific fields. In addition, new global efforts focus on improving biological, chemical, and nuclear security by promoting and implementing best scientific practices as a means to enhance security, increase global partnerships, and create *sustainability.*

#### And, It’s the best way to solve war

Krasnodebska 12—Former Contributing Researcher for the USC Center for Conflict Prevention. Master of Public Diplomacy, USC (Molly, Conflict Prevention, <http://uscpublicdiplomacy.org/index.php/newswire/media_monitor_reports_detail/science_diplomacy/>

Science diplomacy can function as a tool for conflict prevention and be understood as fostering cooperation between the scientific communities of hostile countries. Cooperation in the field of scientific research can help bridge the gap between the countries by creating a forum of mutual support and common interests. In recent years, there have been numerous examples of scientific cooperation between countries that otherwise have no official diplomatic relations. One such example is the ["inter-Korean cooperation"](http://www.csmonitor.com/World/Asia-Pacific/2010/0216/Former-prisoner-of-North-Korea-builds-university-for-his-former-captors) in the chemistry, biotech and nano-science arenas, which was first proposed in March 2010. Science diplomacy between the two Koreas is also exemplified by the foundation of the first privately funded university in communist North Korea, the Pyongyang University of Science and Technology by Dr. Kim Chin-Kyung, a former war prisoner in North Korea. "Educating people is a way to share what they love, and share their values," said the South Korean [in an interview](http://www.csmonitor.com/World/Asia-Pacific/2010/0216/Former-prisoner-of-North-Korea-builds-university-for-his-former-captors). Another example is the [earthquake research cooperation](http://www.monstersandcritics.com/news/asiapacific/news/article_1527746.php/Taiwan-China-to-cooperate-in-earthquake-science-research) between China and Taiwan initiated in January 2010. Chen Cheng-hung, vice chairman of the National Science Council in Taipei calls the initiative the “biggest scientific cooperation program between the two sides of the Taiwan Straits so far.” The United States launched a science diplomacy campaign toward Iran. The two countries, which have had no formal relations since 1980, have re-launched their ‘broken dialogue” though science. In the summer of 2009, the American Association for the Advancement of Science established a new Center for Science Diplomacy in Iran. [According to *Miller-McCune*](http://www.miller-mccune.com/politics/science-diplomacy-trading-frock-coats-for-lab-coats-3953/), this “scientist-to scientist exchange” is more effective that governmental public diplomacy initiatives. The two countries instead of trying to “influence each other’s behavior…will learn something in the process.” In addition, science diplomacy for conflict prevention can also be understood as the use of science and technology to enhance global or regional security. Solving regional problems and advancing peoples’ well-being though technology by providing them with access to water, clean energy, food, and information can prevent the rise of conflicts. The United States had been the leading country in the use of science and technology diplomacy for the purpose of advancing security. This kind of public diplomacy is particularly directed towards the Muslim world. One example of this is ["vaccine diplomacy."](http://www.scidev.net/en/opinions/vaccine-research-for-peace-1.html) In an interview for SciDevNet in March 2010, Peter J. Hotez, president of the Sabin Vaccine Institute in Washington D.C. [stated](http://www.scidev.net/en/opinions/vaccine-research-for-peace-1.html): “the United States could help reduce the burden of neglected diseases and promote peace by engaging Islamic nations in collaborative vaccine research and development.” This would “improve vaccine development for neglected diseases” in countries such as Indonesia, Malaysia and Pakistan where vaccine diplomacy is currently being implemented.

#### IFR’s S-PRISM design is really safe

**Blees et al 11** (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/

Metal Fuel: The Ultimate Safety Valve¶ One of the most important of the many superlatives of the IFR is its use of a metal fuel comprised of uranium, plutonium and zirconium, and the ingenious manner in which the Argonne team solved the problems of fuel expansion and fuel fabrication, as well as the potentially dangerous overheating scenario. Unlike the fuel fabrication of oxide-fueled reactors that requires the dimensions of the fuel pellets to be uniform to very exacting tolerances, the metal fuel for the IFR can be simply injected into molds and then cooled and inserted into metal tubes (cladding) with a great deal of dimensional tolerance, with a sodium bond filling any voids. If an accident situation occurs that would cause the core to overheat, such as a loss of coolant flow accident, the metal fuel itself will expand, causing neutron leakage to terminate the chain reaction, relying on nothing but the laws of physics.¶ The passive safety characteristics of the IFR were tested in EBR-II on April 3, 1986, against two of the most severe accident events postulated for nuclear power plants. The first test (the Loss of Flow Test) simulated a complete station blackout, so that power was lost to all cooling systems. The second test (the Loss of Heat Sink Test) simulated the loss of ability to remove heat from the plant by shutting off power to the secondary cooling system. In both of these tests, the normal safety systems were not allowed to function and the operators did not interfere. The tests were run with the reactor initially at full power.¶ In both tests, the passive safety features simply shut down the reactor with no damage. The fuel and coolant remained within safe temperature limits as the reactor quickly shut itself down in both cases. Relying only on passive characteristics, EBR-II smoothly returned to a safe condition without activation of any control rods and without action by the reactor operators. The same features responsible for this remarkable performance in EBR-II will be incorporated into the design of future IFR plants, regardless of how large they may be [xi].¶ While the IFR was under development, a consortium of prominent American companies led by General Electric collaborated with the IFR team to design a commercial-scale reactor based upon the EBR-II research. This design, currently in the hands of GE, is called the PRISM (Power Reactor Innovative Small Module). A somewhat larger version (with a power rating of 380 MWe) is called the S-PRISM. As with all new nuclear reactor designs (and many other potentially hazardous industrial projects), probabilistic risk assessment studies were conducted for the S-PRISM. Among other parameters, the PRA study estimated the frequency with which one could expect a core meltdown. This occurrence was so statistically improbable as to defy imagination. Of course such a number must be divided by the number of reactors in service in order to convey the actual frequency of a hypothetical meltdown. Even so, if one posits that all the energy humanity requires were to be supplies solely by IFRs (an unlikely scenario but one that is entirely possible), the world could expect a core meltdown about once every 435,000 years [xii]. Even if the risk assessment understated the odds by a factor of a thousand, this would still be a reactor design that even the most paranoid could feel good about.

#### Plan is modeled internationally

**Blees et al** 11 (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) [http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/](http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http%3A//bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/)

There are many compelling reasons to pursue the rapid demonstration of a full-scale IFR, as a lead-in to a subsequent global deployment of this technology within a relatively short time frame. Certainly the urgency of climate change can be a potent tool in winning over environmentalists to this idea. Yet political expediency—due to widespread skepticism of anthropogenic causes for climate change—suggests that the arguments for rolling out IFRs can be effectively tailored to their audience. Energy security—especially with favorable economics—is a primary interest of every nation.¶ The impressive safety features of new nuclear power plant designs should encourage a rapid uptick in construction without concern for the spent fuel they will produce, for all of it will quickly be used up once IFRs begin to be deployed. It is certainly manageable until that time. Burying spent fuel in non-retrievable geologic depositories should be avoided, since it represents a valuable clean energy resource that can last for centuries even if used on a grand scale.¶ Many countries are now beginning to pursue fast reactor technology without the cooperation of the United States, laboriously (and expensively) re-learning the lessons of what does and doesn’t work. If this continues, we will see a variety of different fast reactor designs, some of which will be less safe than others. Why are we forcing other nations to reinvent the wheel? Since the USA invested years of effort and billions of dollars to develop what is arguably the world’s safest and most efficient fast reactor system in the IFR, and since several nations have asked us to share this technology with them (Russia, China, South Korea, Japan, India), there is a golden opportunity here to develop a common goal—a standardized design, and a framework for international control of fast reactor technology and the fissile material that fuels them. This opportunity should be a top priority in the coming decade, if we are serious about replacing fossil fuels worldwide with sufficient pace to effectively mitigate climate change and other environmental and geopolitical crises of the 21st century.

#### IFRs are ready for commercial application – solves tech leadership and coal plants

**Kirsh 11** (Steven T. Kirsh, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, “Why Obama should meet Till,” 9/28/11) http://bravenewclimate.com/2011/09/28/why-obama-should-meet-till/¶ I will tell you the story of an amazing clean power technology that can use nuclear waste for fuel and emit no long-lived nuclear waste; that can supply clean power at low cost for our planet, 24×7, for millions of years without running out of fuel. I will tell you why this technology is our best bet to reduce the impact of global warming on our planet. And finally, I will tell you why nobody is doing anything about it and why this needs to be corrected.¶ If you act on this letter, you will save our country billions of dollars and allow us to become leaders in clean energy. If you delegate it downward, nothing will happen.¶ I have no vested interest in this; I am writing because I care about the future of our planet¶ First, since we met only briefly during the Obama campaign, let me provide a little background about myself. I am a high-tech entrepreneur and philanthropist based in Silicon Valley. I have received numerous awards for my philanthropy. For example, in 2003, I was honored to receive a National Caring Award presented by then Senator Clinton. The largest engineering auditorium at MIT is named in my honor. The first community college LEED platinum building in the nation is also named in my honor.¶ I am also active in Democratic politics. In the 2000 election, for example, I was the single largest political donor in the United States, donating over $10 million dollars to help Al Gore get elected. Unfortunately, we lost that one by one vote (on the Supreme Court).¶ I have no vested interest in nuclear power or anything else that is described below. I write only as someone who cares about our nation, the environment, and our planet. I am trying to do everything I can so my kids have a habitable world to live in. Nothing more.¶ Dr. James Hansen first made me aware of fast reactors in his letter to Obama in 2009¶ As an environmentalist, I have been a fan of Jim Hansen’s work for nearly two decades. Many consider Dr. Hansen to be the world’s leading expert on global warming. For example, Hansen was the first person to make Congress aware of global warming in his Senate testimony in 1988. Hansen is also Al Gore’s science advisor.¶ In 2009, Dr. Hansen wrote a letter to President Obama urging him to do just three things that are critical to stop global warming: 1) phase out coal plants, 2) impose a feebate on carbon emissions with a 100% rebate to consumers and 3) re-start fourth generation nuclear plants, which can use nuclear waste as fuel. Hansen’s letter to Obama is documented here: http://www.guardian.co.uk/environment/2009/jan/02/obama-climate-change-james-hansen¶ Upon reading Hansen’s recommendations, I was fascinated by the last recommendation. The fourth-generation power plants Hansen advocated sounded too good to be true. If what Hansen was saying was true, then why wasn’t our nation jumping on that technology? It made no sense to me.¶ Lack of knowledge, misinformation, and the complexity of nuclear technology have hampered efforts to get a fast reactor built in the US¶ I spent the next two years finding out the answer to that question. The short answer is three-fold: (1) most people know absolutely nothing about the amazing fourth generation nuclear power plant that we safely ran for 30 years in the US and (2) there is a lot of misleading information being spread by seemingly respectable people (some of whom are in the White House) who never worked on a fourth generation reactor that is totally false. It’s not that they are misleading people deliberately; it’s just that they were either listening to the wrong sources or they are jumping to erroneous conclusions. For example, the most popular misconception is that “reprocessing is a proliferation risk.” That statement fails to distinguish between available reprocessing techniques. It is absolutely true for the French method but it is absolutely not true for the technology described in this letter! The third reason is that the technology is complicated. Most people don’t know the difference between oxide fuel and metal fuel. Most people don’t know what a fast reactor is. Most people can’t tell you the difference between PUREX, UREX, and pyroprocessing. So people with an agenda can happily trot out arguments that support their beliefs and it all sounds perfectly credible. They simply leave out the critical details.¶ We don’t need more R&D. We already have a technology in hand to help us solve global warming and safely get rid of our nuclear waste at low cost. But we aren’t doing anything with it. That’s a serious mistake.¶ Today, our nation faces many serious challenges such as:¶ How can we avert global warming?¶ How can we dispose of our existing nuclear waste safely?¶ How can we generate base-load carbon-free power at very low cost?¶ How can we avoid creating any additional long-lived nuclear waste?¶ How can we grow our economy and create jobs?¶ How can we become the world leader in clean energy?¶ How can we do all of the above while at the same time spending billions less than we are now?¶ The good news is that we already have a proven technology that can address all of these problems. It is a technology that has enjoyed over 30 years of bi-partisan Congressional and Presidential support. It is an advanced nuclear technology that was invented in 1951 by the legendary Walter Zinn and then refined and perfected over a 30 year period, from 1964 to 1994 by Dr. Charles Till who led a team of 1,200 people at the Argonne National Laboratory. Till’s reactor was known as the Integral Fast Reactor (IFR) because it both produced power and recycled its own waste back into the reactor. This is the technology that Hansen referenced in his letter to the President.¶ The IFR is a fourth-generation nuclear design that has several unique and valuable characteristics:¶ It can use our existing nuclear waste (from power plants and weapons) as fuel; we have over 1,000 years of power available by just using today’s nuclear waste. Instead of trying to bury that “waste” in Yucca Mountain, we could be using it for fuel in fast reactors.¶ It generates no long-lived nuclear waste.¶ It is safer than today’s light water reactor (LWR) nuclear power plants. Unlike the Fukushima LWR reactors (a second generation nuclear technology invented 50 years ago), the IFR does NOT require electricity to shut down safely. The IFR shuts down passively if a mishap occurs; no operator intervention or active safety systems are required. They ran the Three Mile Island and Chernobyl scenarios on a live reactor and the reactor shut itself down safely, no operator intervention required, just as predicted. In addition, unlike with LWRs, the IFR runs at low pressure which adds to the safety profile.¶ It reduces the risk of nuclear proliferation because: (1) it eliminates the need for enrichment facilities (which can be used for making nuclear bomb material), (2) the nuclear material that is used in the IFR is not suitable for making bombs and (2) because the nuclear material in the reactor and in the reprocessing hot cell is too “hot” to be stolen or used in a weapon.¶ Experts at General Electric (GE) believe that the IFR has the potential to produce power for less than the price of coal. Dr. Loewen can confirm that if you have any doubts.¶ GE already has an IFR design on the table that they would like to build as soon as possible. Dr. Loewen can confirm that as well.¶ The US Nuclear Regulatory Commission, in January 1994, issued a pre-application safety evaluation report in which they found no objections or impediments to licensing the IFR. You can see the NRC report in the 8 minute video.¶ The design is proven. It produced electric power without mishap for 30 years before the project was abruptly cancelled.¶ Dr Charles Till¶ The IFR’s ability to solve the nuclear waste problem should not be underestimated. As respected nuclear experts have pointed out, a practical solution to the nuclear waste problem is required if we are to revive nuclear power in the United States. The Blue Ribbon Commission (BRC) on America’s Nuclear Future basically concluded this: “continue doing the same thing we are doing today and keep doing R&D.” That was predictable because it was a consensus report; everyone had to agree. So nothing happened. And because there was no consensus from the BRC , there is less money for nuclear because there is no solution to the waste problem. It’s a downward death spiral.¶ Please pardon me for a second and allow me to rant about consensus reports. In my 30 year career as an entrepreneur, I’ve raised tens of millions of millions of dollars in investment capital from venture capitalists all over the world. I always ask them how they make investment decisions. They always tell me, “If we had to get all partners to agree on an investment, we’d never make any investments. If you can get two partners to champion your company, that is sufficient to drive an investment decision.” Therefore, if you want to get nothing done, ask for a consensus report. If you want to actually solve problems, you should listen to what the people most knowledgeable about the problem are saying.¶ Dr Yoon I. Chang¶ Had President Obama asked the Commissioners on the Nuclear Regulatory Commission (NRC) who have the most knowledge of fast reactors the same question that he tasked the BRC with, he would have gotten a completely different answer. They would have told President Obama that fast reactors and pyroprocessing are the way to go and we better get started immediately with something that we already know works because there is still a ten year time if we were to start the reactor building process today. Their advice leads to a viable solution that we know will work and it will make the US a leader in clean nuclear power. Following the BRC’s consensus advice will lead to decades of inaction. Totally predictable.¶ If we put a national focus on developing and cost reducing the IFR, we’d have a killer product and lead the world in being a clean energy leader¶ It would be great if we had a long-term strategy and vision for how we become energy independent and solve the global warming problem and help our economy at the same time. The IFR can play a key role in that vision. If we put a national focus on developing and commercializing the IFR technology we invented, we can create jobs, help our trade balance, mitigate global warming, become energy independent, show the world a safe way to get rid of nuclear waste, and become the leaders in clean power technology.¶ Nuclear power is the elephant in the room. Even though we haven’t built a new nuclear plant in 30 years, nuclear still supplies 70% of the clean energy in America today. That feat was largely accomplished in a single ten year period. Renewables have had 3 decades to “catch up” and they aren’t anywhere close. Nuclear’s continued dominance shows that nuclear power is indeed the elephant in the room when it comes to being able to install clean energy quickly and affordably.¶ The bad news is that President Clinton decided that this technology, which would have produced unlimited amounts of base-load carbon-free power for a price as low as anything else available today, was not needed and cancelled the project in 1994.¶ Cancelling the IFR was a big mistake. It’s still the world’s best fast nuclear technology according to an independent study by the Gen IV International Forum.¶ Many top scientists all over the world believe that President Clinton’s decision was a huge mistake. The Senate had voted to continue to fund it. The project had been supported by six US Presidents; Republicans and Democrats. In fact, the project’s biggest proponent was Republican President Richard Nixon who said in 1971, “Our best hope today for meeting the Nation’s growing demand for economical clean energy lies with the fast breeder reactor.”¶ Republican Senator Kempthorne said of the IFR cancellation:¶ Unfortunately, this program was canceled just 2 short years before the proof of concept. I assure my colleagues someday our Nation will regret and reverse this shortsighted decision. But complete or not, the concept and the work done to prove it remain genius and a great contribution to the world.¶ While I am not a big fan of Senator Kempthorne, I couldn’t agree more with what he said in this particular case.¶ The IFR remains the single best advanced nuclear power design ever invented. That fact was made clear when in 2002, over 240 leading nuclear scientists from all over the world (in a Gen IV International Forum sponsored study) independently evaluated all fourth-generation nuclear designs and ranked the IFR the #1 best overall advanced nuclear design.¶ The IFR was cancelled in 1994 without so much as a phone call to anyone who worked on the project. They didn’t call then. They haven’t called since. They simply pulled the plug and told people not to talk about the technology.¶ The US government invested over $5 billion dollars in the IFR. Fast reactor R&D is largest single technology investment DOE has ever made. According to a top DOE nuclear official (Ray Hunter, the former NE2 at DOE), the “IFR became the preferred path because of waste management, safety, and economics.” The reactor produced power for 30 years without incident. Despite that track record, before it was cancelled, nobody from the White House ever met with anyone who worked on the project to discuss whether it should be terminated or not. It was simply unilaterally terminated by the White House for political reasons. Technical experts were never consulted. To this day, no one from the White House has met with Dr. Till to understand the benefits of the project. The technical merits simply did not matter.¶ I urge you to recommend to President Obama that he meet personally with Dr. Charles Till so that the President can hear first hand why it is so critical for the health of our nation and our planet that this project, known as the Integral Fast Reactor (IFR), be restarted. Dr. Till headed the project at Argonne National Laboratory until his retirement in 1997. He is, without a doubt, the world’s leading expert on IFR technology.¶ Want to solve global warming? Easy. Just create a 24×7 clean power source that costs the same as coal. Prominent scientists believe that the IFR can achieve this.¶ Dr. Hansen has pointed out many times that it is imperative to eliminate all coal plants worldwide since otherwise, we will never win the battle against global warming. But we know from experience that treaties and agreements do not work. Here’s a quote from an article (“The Most Important Investment that We Aren’t Making to Mitigate the Climate Crisis”) that I wrote in December 2009 published in the Huffington Post:¶ If you want to get emissions reductions, you must make the alternatives for electric power generation cheaper than coal. It’s that simple. If you don’t do that, you lose.¶ The billions we invest in R&D now in building a clean and cheaper alternative to coal power will pay off in spades later. We have a really great option now — the IFR is on the verge of commercial readiness — and potential competitors such as the Liquid Fluoride Thorium Reactor (LFTR) are in the wings. But the US government isn’t investing in developing any of these breakthrough new base-load power generation technologies. Not a single one.¶ I found it really amazing that global leaders were promising billions, even hundreds of billions in Copenhagen for “fighting climate change” when they weren’t investing one cent in the nuclear technologies that can stop coal and replace it with something cheaper.¶ [ Note: 6 days ago, on September 22, 2011, DOE agreed to give $7.5M to MIT to do R&D on a molten-salt reactor. That’s good, but we should be building the technology we already have proven in 30 years of operational experience before we invest in unproven new technologies. ]¶ Dr. Loewen has personally looked at the costs for the building the IFR in detail and believes the IFR can generate power at a cost comparable to a coal plant. So it’s arguably our best shot at displacing coal plants. This is precisely why Dr. Hansen believes that the IFR should be a top priority if we want to save our planet.¶ It isn’t just nuclear experts that support the IFR¶ US Congressman John Garamendi (D-CA) is also a major IFR supporter. When he was Lt. Governor of California, Congressman Garamendi convened a panel of over a dozen our nation’s top scientists to discuss the IFR technology. As a result of that meeting, Garamendi became convinced that the IFR is critically important and he is currently trying very hard to get a bill passed in the House to restart it. Unfortunately, virtually everyone in Congress seems to have forgotten about this project even though in the 1970’s it was the President’s top energy priority. Nothing has changed since then. No other clean energy technology has been invented that is superior to the IFR for generating low-cost carbon-free base-load electric power.¶ Bill Gates also found exactly the same thing when he looked at how to solve the global warming problem. As he explained in a recent TED talk, renewables will never solve the climate crisis. The only viable technology is fourth-generation nuclear power and the best advanced nuclear technology is the IFR. That is why this is Gate’s only clean energy investment. Gates’ TerraPower Travelling Wave Reactor (TWR) is a variant of the IFR design. When Gates approached DOE to try to build his reactor in the US, he was told to build it outside of the US.¶ Nobel prize winner Hans Bethe (now deceased) was an enthusiastic supporter. Freeman Dyson called Bethe the “supreme problem solver of the 20th century. Chuck Till told me the following story of Bethe’s support for the IFR:¶ A tale from the past: A year or two before the events I’ll describe, Hans Bethe had been contacted by the Argonne Lab Director for his recommendation on who to seek to replace the existing head of Argonne’s reactor program.¶ Bethe told him the best choice was already there in the Lab, so it was in this way that I was put in charge. I had had quite a few sessions with him in the years leading up to it, as we were able to do a lot of calculations on the effects of reactor types on resources that he didn’t have the capability at his disposal to do himself.¶ So when I wanted to initiate the IFR thrust, the first outside person I went to was Bethe at Cornell. After a full day of briefing from all the specialists I had taken with me, he suggested a brief private meeting with me. He was direct. He said “All the pieces fit. I am prepared to write a letter stating this. Who do you want me to address it to? I think the President’s Science Advisor, don’t you?” I said the obvious – that his opinion would be given great weight, and would give instant respectability.¶ He went on, “I know him quite well. Who else?” I said I was sure that Senator McClure (who was chairman of Senate Energy and Resources at the time) would be relieved to hear from him. That the Senator would be inclined to support us, as we were fairly prominent in the economy of the state of Idaho, and for that reason I had easy access to him. But to know that Hans Bethe, a man renowned for his common sense in nuclear and all energy matters, supported such an effort would give him the Senator solid and quotable reason for his own support, not dismissible as parochial politics, that the Senator would want if he was to lead the congressional efforts. “Yes,” he said in that way he had, “I agree.”¶ I’ve always thought that the President’s Science Advisor’s intervention with DOE, to give us a start, was not the result of our meeting him, but rather it was because of the gravitas Hans Bethe provided with a one page letter.¶ How do we lead the world in clean energy if we put our most powerful clean energy technology on the shelf?!?¶ President Obama has stated that he wants the US to be a leader in clean energy. I do not see how we achieve that if we allow our most advanced clean energy technology to sit on the shelf collecting dust and we tell one of America’s most respected businessmen that he should build his clean energy technology in another country. We have an opportunity here to export energy technology to China instead of importing it. But due to Clinton’s decision, we are allowing the Russians to sell similar fast reactor technology to the Chinese. It should have been us.¶ Re-starting the IFR will allow us to cancel a $10 billion stupid expenditure. The IFR only costs $3B to build. We’d get more, pay less. On pure economics alone, it’s a no brainer.¶ Finally, even if you find none of the arguments above to be compelling, there is one more reason to restart the IFR project: it will save billions of dollars. Today, we are contracting with the French to build a MOX reprocessing plant in Savannah River. The cost of that project is $10 billion dollars. We are doing it to meet our treaty obligations with the Russians. Former top DOE nuclear managers agree this is a huge waste of money because we can build an IFR which can reprocess 10 times at much weapons waste per year for a fraction of that cost.¶ The Russians are laughing at our stupidity. They are going to be disposing of their weapons waste in fast reactors, just like we should be. The Russians are also exporting their fast reactors to the Chinese. Had the US not cancelled our fast reactor program, we would be the world leader in this technology because our technology remains better than any other fourth generation technology in the world.¶ If you delegate this to someone else, nothing will happen. Here’s why.¶ Delegating this letter downward from the White House to someone in DOE to evaluate will result in inaction and no follow up. I know this from past attempts that have been made. It just gets lost and there is no follow up. Every time. The guys at DOE want to do it, but they know that they will get completely stopped by OMB and OSTP. Both Carol Browner and Steven Chu asked former DOE nuclear management what to do about nuclear waste. They were told that using fast reactors and reprocessing was the way to go. But nothing happened. So Chu has given up trying. According to knowledgeable sources, the White House has told DOE in no uncertain terms, “do not build anything nuclear in the US.” It’s not clear who is making these decisions, but many people believe it is being driven by Steven Fetter in OSTP.¶ Dr. Till knows all of this. He knows that unless he personally meets with the President to tell the story of this amazing technology, nothing will happen.¶ I’ve discussed the IFR with Steve Fetter and he has his facts wrong. Fetter is basically a Frank von Hippel disciple: they have written at least 14 papers together! It was von Hippel who was largely responsible for killing the IFR under Clinton.¶ So von Hippel’s misguided thought process is driving White House policy today. That’s a big mistake. Professor von Hippel twists the facts to support his point of view and fails to bring up compelling counter arguments that he knows are true but would not support his position. He’s not being intellectually honest. I’ve experienced this myself, firsthand. For example, von Hippel often writes that fast reactors are unreliable. When I pointed out to him that there are several examples of reliable fast reactors, including the EBR-II which ran for decades without incident, he said, that these were the “exceptions that prove the rule.” I was floored by that. That’s crazy. It only proves that it is complicated to build a fast reactor, but that it can easily be done very reliably if you know what you are doing. There is nothing inherent to the technology that makes it “unreliable.” You just have to figure out the secrets. When von Hippel heard that Congressman Garamendi was supporting the IFR, he demanded a meeting with Garamendi to “set him straight.” But what happened was just the opposite: Garamendi pointed out to von Hippel that von Hippel’s “facts” were wrong. Von Hippel left that meeting with Garamendi with his tail between his legs muttering something about that being the first time he’s ever spoken with anyone in Congress who knew anything about fast nuclear reactors. In short, if you watch a debate between von Hippel and Garamendi (who is not a scientist), Garamendi easily wins on the facts. If you put von Hippel up against someone who knows the technology like Till, Till would crush von Hippel on both the facts and the arguments. But the Clinton White House never invited Till to debate the arguments with von Hippel. They simply trusted what von Hippel told them. Big mistake.¶ There are lots of problems with von Hippel’s arguments. For example, von Hippel ignores reality believing that if the USA doesn’t do something then it will not happen. That’s incredibly naieve and he’s been proven wrong. The USA invented a safe way to reprocess nuclear waste that isn’t a proliferation risk called pyroprocessing. The nuclear material is not suitable for making a bomb at any time in the process. But we never commercialized it because von Hippel convinced Clinton to cancel it. The French commercialized their reprocessing process (PUREX) which separates out pure plutonium and makes it trivial to make bomb material. So because countries need to reprocess, they pick the unsafe technology because they have no alternative. Similarly, because von Hippel had our fast reactor program cancelled, the Russians are the leaders in fast reactor technology. They’ve been using fast reactor technology for over 30 years to generate power commercially. But we know the Russians have a terrible nuclear safety record (e.g., Chernobyl). The fact is that the Chinese are buying fast reactors from the Russians because there is no US alternative. The problem with von Hippel’s arguments are that the genie is out of the bottle. We can either lead the world in showing how we can do this safely, or the world will choose the less safe alternatives. Today, von Hippel’s decisions have made the world less safe. I could go on and on about how bad von Hippel’s advice is, but this letter is already way too long.¶ MIT was wrong in their report about “The Future of the Nuclear Fuel Cycle”¶ The only other seemingly credible argument against building fast reactors now comes from MIT. The report’s recommendation that we have plenty of time to do R&D appears largely to be driven by one person, co-chair Ernie Moniz.¶ Four world-famous experts on nuclear power and/or climate change and one Congressman challenged Moniz to a debate on the MIT campus on his report. Moniz declined.¶ The report has several major problems. Here are a few of them.¶ The MIT report is inconsistent. On the one hand it says, “To enable an expansion of nuclear power, it must overcome critical challenges in cost, waste disposal, and proliferation concerns while maintaining its currently excellent safety and reliability record.” We agree with that! But then it inexplicably says, “… there are many more viable fuel cycle options and that the optimum choice among them faces great uncertainty…. Greater clarity should emerge over the next few decades… A key message from our work is that we can and should preserve our options for fuel cycle choices by …[continuing doing what we are doing today] … and researching technology alternatives appropriate to a range of nuclear energy futures.” So even though we have a solution now that can be deployed so we can enable an expansion of nuclear power as soon as possible, MIT advises that we should spend a few more decades because we might find something better than the IFR. This is just about the dumbest thing I’ve ever heard coming from MIT. If you ask any scientist who knows anything about global warming, they will tell you we are decades late in deploying carbon-free power. Had we aggressively ramped fast nuclear closed-cycle reactors decades ago and promoted them worldwide, we wouldn’t be anywhere close to the disastrous situation we are in today. So we are decades too late in ramping up nuclear power, and Moniz wants us to spend decades doing more R&D to get a solution that might be lower cost than the IFR. That’s insane.¶ The report looks at the market price of uranium, but the market price completely ignores the environmental impacts of uranium mining. Shouldn’t that be taken into account? It’s like the cost of gas is cheap because the market price doesn’t include the hidden costs: the impact on the environment and on our health.¶ Do you really think that people are going to embrace expansion of uranium mining in the US? The MIT report is silent on that. So then we are back to being dependent on other countries for uranium. Wasn’t the whole point to be energy independent? The IFR provides that now. We wouldn’t have to do any uranium mining ever again. After a thousand years, when we’ve used all our existing nuclear waste as fuel, we can extract the additional fuel we need from seawater, making our seas less radioactive. We can do that for millions of years.¶ The MIT report ignores what other countries are doing. Obama wants the US to be a leader in clean energy technology. You do that by building the most advanced nuclear designs and refining them. That’s the way you learn and improve. MIT would have us stuck on old LWR technology for a few decades. Does anyone seriously think that is the way to be the world leader? There is virtually no room for improvement in LWR technology. IFR technology is nearly 100 times more efficient, and it emits no long term nuclear waste. If you are a buyer of nuclear power in China, which nuclear reactor are you going to pick? The one that is 100 times more efficient and generates no waste? Or the one that is 100 times less efficient and generates waste that you better store for a million years? Wow. Now that’s a real tough question, isn’t it. Gotta ponder that one. I’m sure Apple Computer isn’t taking advice from Moniz. If they were, they’d still be building the Apple I. Ernie should get a clue. The reason Apple is a market leader is because they bring the latest technology to market before anyone else, not because they keep producing old stuff and spend decades doing R&D to see if they can come up with something better. Other countries are not hampered by MIT’s report. France and Japan recently entered into an agreement with the US DOE whereby we’re giving them the IFR technology for them to exploit. Even though we are stupid, they aren’t stupid. The Chinese are ordering inferior oxide fueled fast reactors from Russia. If the US were building metal-fueled fast reactors with pyroprocessing, it’s a good bet the Chinese would be buying from us instead of the Russians. But if we take Moniz’s advice to not build the world’s best advanced nuclear technology we already have, then there is no chance of that happening. By the time we get to market with a fast reactor, it will be all over. We’ll arrive to the market decades late. Another great American invention that we blew it on.¶ There will always be new technologies that people will propose. But the IFR is a bird in the hand and we really need a solution now we can depend on. If something comes along later that is better, that’s great. But if it doesn’t, we will have a viable technology. We can’t afford to get this wrong. We have already run out of time. Any new nuclear designs are decades away from deployment.¶ On September 22, 2011, DOE agreed to give MIT $7.5 millions of dollars on starting R&D on a fourth generation molten salt reactor design that have never been proven. While it might work, the very smart scientists at Oak Ridge National Laboratory spent well over a decade on this and were never able to make it work. So DOE is spending millions on an unproven design while spending nothing on the “sure thing” fourth generation reactor that we already know how to build and that ran flawlessly for 30 years. We are all scratching our heads on that one. It makes no sense. But the reason for this is clear: the mandate from the White House that nothing is to built means that DOE can only initiate research, and then cancel the project right before anything would be built. This is an excellent plan for demoralizing scientists and allowing other countries to lead the world in clean energy. Is that really what we want?? If so, then there are much less expensive ways to accomplish that.¶ At a minimum we should be investing in commercializing our “bird in the hand.” That way, if the new molten salt reactor experiments don’t work out, we’ll still have a viable solution to the nuclear waste problem. If we keep cancelling successful projects right before they are done, hoping for the next big thing, we will forever be in R&D mode and get nothing done. That’s where we are today with fourth generation nuclear.¶ I know this is an unusual request, but I also know that if the President is allowed to evaluate the facts first hand, I am absolutely convinced that he will come to the same conclusion as we all have.¶ I urge you to view an 8 minute video narrated by former CBS Morning News anchor Bill Kurtis that explains all of this in a way that anyone can understand. This video can be found at:¶ The video will amaze you.¶ If you would like an independent assessment of what I wrote above from a neutral , trustworthy, and knowledgeable expert, Bill Magwood would be an excellent choice. Magwood was head of nuclear at DOE under Clinton and Bush, and was the longest serving head of nuclear at DOE in US history. He served under both Clinton and Bush administrations. Magwood is familiar with the IFR, but the IFR was cancelled before he was appointed to head civilian nuclear at DOE. So Magwood has no vested interest in the IFR at all. More recently, Magwood was appointed by President Obama to serve on the NRC and is currently serving in that role. Of the current five NRC Commissioners, Magwood is by far, the person most knowledgeable (PMK) about fast reactors.¶ Thank you for your help in bringing this important matter to the President’s attention.¶ Summary¶ Nuclear power is needed. Renewables alone won’t do it.¶ In order to revive nuclear in the US, you must have a viable solution to the nuclear waste problem.¶ The French reprocess their nuclear waste, but their process is expensive, environmentally unfriendly, and has proliferation problems.¶ The USA developed an inexpensive, environmentally friendly, and proliferation resistant method to reprocess our waste (the IFR), but we cancelled it. That decision was a mistake.¶ We should restart the IFR in the US. It will cost $3B to build, but we can cancel the Areva MOX plant and save $10B to pay for it. So we’ll save money, save the planet from an environmental catastrophe, create jobs, get rid of our nuclear waste, and become the world leader in clean energy technology.¶ President Obama should meet personally with Dr. Charles Till, the world’s leading expert on fast reactor technology. Dr. Till will not waste his time meeting with anyone other than the President because he knows that without personal support of the President, nothing will happen. He’s right.¶ Supporters of this technology include Nobel prize winner Hans Bethe (now deceased), Steven Chu, Dr. James Hansen, Dr. Charles Till, Dr. Eric Loewen, Congressman John Garamendi, Bill Gates, and even the President of MIT. Even the board of directors of the historically anti-nuclear Sierra Club has agreed that they will not oppose building an IFR!¶ Opposition is from OSTP and OMB. We don’t know who or why. It’s a mystery to all my sources. Frank von Hippel thinks you cannot make fast reactors cheaply or reliably and maintains that stance even when the facts show that not to be the case. Ernie Moniz at MIT thinks we shouldn’t build anything now, but do more R&D for the next several decades hoping we can find something better.¶ Bill Magwood, an Obama appointee to the NRC, would be a reasonable choice to provide an objective assessment of the IFR. He has no vested interested in the IFR, but having been the longest serving head of DOE civilian nuclear in history, is familiar with the pros and cons of the technology.¶ Should OSTP and OMB be making these key decisions behind closed doors? Is this really reflective of what the President wants? He’s stated publicly he wants the US to be a world leader in clean energy. Is putting our best technology on the shelf, but licensing the French and Japanese to build it (Joint Statement on Trilateral Cooperation in the area of Sodium-cooled Fast Reactors signed on October 4, 2010 by DOE), the best way for the US to achieve the leadership that Obama said he wanted?¶ I am happy to provide you with additional information.

## 2ac

### Topicality 2AC

Bottom arg w/m R+D

#### We meet – the plan is explicitly linked to energy production

Yang, 06 [A “Manhattan Project” for climate change? Chi-Jen Yang & Michael Oppenheimer, Received: 26 January 2006 / Accepted: 9 October 2006 / Published online: 10 January 2007

# Springer Science + Business Media B.V. 2007, <http://www.princeton.edu/step/people/faculty/michael-oppenheimer/recent-publications/Manhattan-Project-for-climate-change.pdf>]

One concrete version of the “technology first” view has been expressed almost daily by scientists, political leaders, and others: Global warming problem can be solved in a timely fashion only through a crash research and development program similar to the Manhattan Project (Clinton 2005; Friedman 2005) or Apollo Project (See http://www.appolloalliance. org). The target of a “Manhattan Project” on Climate Change would be low-carbon technologies for energy generation and use. A common rationale for this approach is that the fossil-fueled greenhouse effect cannot be regulated away, an assertion that ignores the potential affect of regulation on innovation.

#### And, it creates new reactors that ensure increased production

Hutchison, 2009 [Alex, Popular Mechanics, The Next Atomic Age: Can Safe Nuclear Power Work for America?

http://www.popularmechanics.com/science/energy/nuclear/3760347]

In the Energy Policy Act of 2005, Congress approved up to $2.95 billion in incentives for new nuclear plants, and set aside another $1.25 billion for an experimental reactor to be built here in the Idaho desert. The reactor will be the centerpiece of a modern-day Manhattan Project, with scientists from around the world working together to revolutionize the production of nuclear power.

#### And, that means the plan gets a class 103 license – over 50%

NRC, No Date [“PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-0022.html]

A class 103 license will be issued, to an applicant who qualifies, for any one or more of the following: To transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, or use a production or utilization facility for industrial or commercial purposes; Provided, however, That in the case of a production or utilization facility which is useful in the conduct of research and development activities of the types specified in section 31 of the Act, such facility is deemed to be for industrial or commercial purposes if the facility is to be used so that more than 50 percent of the annual cost of owning and operating the facility is devoted to the production of materials, products, or energy for sale or commercial distribution, or to the sale of services, other than research and development or education or training.

#### And, we meet that standard

C4L, 12 [[The Manhattan Project](http://c4lrutherford.org/2012/07/27/the-manhattan-project/), Campaign For Liberty, Campaign For Liberty's Mission Our mission is to promote and defend the great American principles of individual liberty, constitutional government, sound money, free markets, and a Constitutional foreign policy, by means of educational and political activity. http://c4lrutherford.org/2012/07/27/the-manhattan-project/]

The Moment in Time papers a capricious days of a commencement of [World War II](http://c4lrutherford.org/goto/http%3A/topdocumentaryfilms.com/history-of-world-war-ii-hiroshima/) when it was feared a Nazis were building a [atomic bomb](http://c4lrutherford.org/goto/http%3A/topdocumentaryfilms.com/the-atomic-cafe/). The story of a bomb’s growth is traced by recollections of those who worked on what was famous as “the gadget”. The Manhattan Project was a investigate and growth program, led by a United States with appearance from a United Kingdom and Canada, that constructed a initial atomic explosve during World War II. From 1942 to 1946, a plan was underneath a instruction of Major General Leslie Groves of a US Army Corps of Engineers. The Manhattan Project began modestly in 1939, though grew to occupy some-more than 130,000 people and cost scarcely US$2 billion (roughly homogeneous to $25.8 billion as of 2012). Over 90% of a cost was for building factories and producing a fissionable materials, with reduction than 10% for growth and prolongation of a weapons.

#### And, incentives for energy production are the commercial transfer of resources linked to market expansion

EIA, 01 [United States Department of Energy Environmental Information Incentives, Mandates, and Government Programs for Promoting Renewable Energy, “Report Date: February 2001 Next Release Date: None Incentives, Mandates, and Government Programs for Promoting Renewable Energy by Mark Gielecki, Fred Mayes, and Lawrence Prete, [http//lobby.la.psu.edu/\_107th/128\_PURPA/Agency\_Activities/EIA/Incentive\_Mandates\_and\_Government.htm](http://lobby.la.psu.edu/_107th/128_PURPA/Agency_Activities/EIA/Incentive_Mandates_and_Government.htm)]

A financial incentive is defined in this report as providing one or more of the following benefits: A transfer of economic resources by the Government to the buyer or seller of a good or service that has the effect of reducing the price paid, or, increasing the price received, respectively; Reducing the cost of production of the good or service; or, Creating or expanding a market for producers.

#### And, we meet this interp

Michaelson, 98 [GEOENGINEERING: A CLIMATE CHANGE MANHATTAN PROJECT Jay Michaelson [FNa1] Copyright © 1998 Board of Trustees of the Leland Stanford Junior University; Jay Michaelson, <http://www.docstoc.com/docs/38980921/13725491-Geoengineering-A-Climate-Change-Manhattan-Project>]

In some ways, this phase has already begun, as geoengineering has moved from the pages of science fiction to respectable scientific and policy journals. [FN127] One of the most encouraging proposals today focuses on the creation of vast carbon sinks by artificially stimulating phytoplankton growth with iron "fertilizer" in parts of the Earth's oceans. [FN128] Another proposal suggests creating miniature, \*106 artificial "Mount Pinatubos" by allowing airplanes to release dust particles into the upper atmosphere, simulating the greenhouse- arresting eruption of Mount Pinatubo in 1991. [FN129] Such findings, though encouraging, remain on a very preliminary level. Phase One of a Climate Change Manhattan Project would be a dedicated, "serious look at geoengineering" [FN130] by coordinated efforts in the scientific community. For the policymaker, the flexibility of this first phase is a key attraction. It need not--though it may--be an international, top-down research and development effort. It might take the form of several "Golden Carrot" programs offering rewards to the first private actor to develop a feasible geoengineering proposal. [FN131] Geoengineering innovations might even spring from interested "exo-national" actors, along the lines of media magnate Ted Turner's unilateral effort to fund U.N. programs, or, given the financial windfall I suggest awaits a successful proposal, self-interested ones. [FN132]

#### And, counter interp applied r and d only – means no spinoff advantages

EIA 99 – Energy Information Administration / Federal Energy Market Interventions 1999: Primary Energy, "3. Federal Energy Research and Development", <http://www.eia.gov/oiaf/servicerpt/subsidy/pdf/research.pdf>)

Research and Development Defined

Federal energy-related R&D can be described as falling into three classes: basic research, research that seeks to develop newenergy technologies**,** and research that seeks to improve existing technologies. • Basic Research. The potential beneficiaries of basic research could be considered to be the population of the United States or the world as a whole. Basic research includes research projects designed to pursue the advancement of scientific knowledge and the understanding of phenomena rather than specific applications. • Research To Develop New Technologies. The efforts in this context involve attempts to discover new scientific knowledge that can have commercial application. Although the end objective of the research is known, the research task is difficult and uncertain. • Research To Improve Existing Technologies. These efforts emphasize the use of scientific knowledge to design and test new processes that may have substantial technical and cost uncertainties. The immediate beneficiaries are generally well defined: current producers and consumers of particular fuels or operators, and customers of the technology being improved. Energy Research and Development as a Subsidy It is easier to measure energy R&D spending than to it characterize from a subsidy perspective. R&D spending is intended to create useful knowledge that benefits society. Thus, all Federal R&D spending could, in a general way, be considered a subsidy to knowledge; however, the extent to which specific R&D programs actually affect energy markets is more difficult to ascertain. The results of research are inherently uncertain. Many programs will advance knowledge across a range of energy and non-energy applications, rather than in the context of a particular fuel or form of consumption. Further, the knowledge obtained may be negative, in the sense that the research may only reveal technical or economic dead ends to be avoided in the future.42 Thus, only a portion of Federal energy R&D is likely to achieve results (in the form of changes in energy costs or consumption) that can be attributed specifically to a particular R&D program. Moreover, to the extent that there are attributable results, they are likely to be measurable only years after the funded research effort is initiated. Federal R&D is intended to support research that the private sector would not undertake. It is not supposed to substitute for private-sector R&D. However, the creation of a Government-funded R&D program could, under some circumstances, displace private-sector R&D. In that case, the Federal program would not produce anynet new knowledge but simplyreduce private costs. It is impossible, however, to know with certainty what private-sector firms would have done in the (hypothetical) absence of a Federal program. In general, the less “basic” the R&D program and the more focused on near-term commercialization, the greater the risk that the program will be a substitute for private-sector R&D. There are no means to determine conclusively whether or not particular Federal energy R&D projects are substitutes or complements for private-sector activities. Moreover, because research is risky, with failure an inherent part of the process, the effectiveness of Federal R&D cannot easily be assessed. This report makes no judgments on either of these issues. Rather, it surveys the current composition of Federal R&D spending and provides a degree of historical perspective on the changing composition of Federal energy R&D efforts. There is another issue that is specific to U.S. energy R&D programs: much U.S. energy R&D is aimed not at producing fuels per se but at developing fuel-consuming capital equipment (particularly power generation technologies). Such projects may be more properly viewed as a subsidy to capital equipment manufacturers than to fuel producers or consumers. Although, in principle, all successful power generation R&D benefits electricity consumers, the effects on fuel producers are more ambiguous. Because they are energy-saving technologies, the new technologies will only benefit producers if they help to expand the market for their fuel. Thus, if one seeks to understand the effects, rather than the intent, of R&D spending, the success of the programs must be evaluated, noting that expenditures will necessarily occur long before technology adoption, and considering the competitive consequences of any new technologies introduced. Finally, much of the expenditure that is formally defined as “energy research and development” in the U.S. Government’s budget accounts is not directly expended on energy research or development. Some of the funds are expended for environmental restoration and waste management for energy (particularly nuclear) research facilities, or on R&D on environmental restoration and waste management, or on overhead or difficult-to-allocate functions. Such spending may not have a material impact on current or future energy markets. Energy Research and Development Trends Table 8 allocates Federal energy R&D by energy type and function. Currently, nearly two-thirds of Federal energy R&D ($2.8 billion) is allocated to basic research. DOE’s largest single basic research program is the General Science Program, funded at $1.6 billion in fiscal year 1999. Basic research is difficult to characterize as an energy subsidy, however, because it cannot be allocated between energy and non-energy benefits, or among forms of energy. Therefore, the balance of this chapter focuses on applied energy R&D. Table 8 lists both “estimated” and “actual” research and development appropriations for fiscal year 1992. The estimated appropriations are drawn from the Department of Energy’s fiscal year 1993 budget proposal, prepared in early 1992, which showed appropriations by budget account for the previous fiscal year.43 The estimated appropriations were used in EIA’s 1992 subsidy report. The actual appropriations are drawn from the Office of the Chief Financial Officer’s Appropriation History Tables, prepared in early 1997, which show final appropriations by budget account. The differences between the two columns have multiple causes. The Department transfers (with the approval of Congress) unspent monies from one account to another. This may take place well after the end of a fiscal year if the Department has multi-year spending authority for a particular account. The largest difference between the two columns is due to a large reprogramming of funds for fusion research. There have also been several changes of classification. For example, the account “Biological and Environmental Research” has been transferred from “Environment, Safety, and Health” to “General Science.” In addition, minor errors in the original 1992 report have been corrected in the final appropriations column. For example, some of the expenditures on wind in the “Wind, Photovoltaic, and Other Solar” category were interchanged with biomass expenditures in the 1992 report. Applied R&D is aimed primarily at improving existing technology. Appropriations for applied energy R&D were about $1.5 billion in fiscal year 1999. Of that amount, more than half is allocated to nuclear activities. Within the range of nuclear projects, most of the money is spent on environmental management rather than R&D per se. For coal, the bulk of spending supports development of clean coal technologies. Solar, photovoltaic, and wind energy absorb the major share of renewable energy research funds ($134 million out of a total of $327 million). Expenditures shown as “unallocated” in Table 8 are administrative and miscellaneous programs associated with R&D. For example, unallocated expenditures for nuclear R&D ($143 million) in fiscal year 1999 include program termination costs and program direction. For renewable energy programs, they include program direction and funding for the National Renewable Energy Laboratory ($22 million in fiscal year 1999). The unallocated appropriation for basic energy research ($49.8 million in fiscal year 1999) funds personnel in a variety of research centers and provides support services and other related expenses. Figure 3 illustrates trends in Federal applied energy R&D appropriations from fiscal year 1978 through fiscal year 1998. There were sharp reductions in energy R&D appropriations during the early 1980s, followed by modest growth after 1992. R&D spending by fuel type is dominated by nuclear power R&D, although coal R&D appropriations were boosted in the late 1980s by the advent of the Clean Coal Technology Program, and renewable energy appropriations have risen somewhat since 1990. Federal R&D spending related to oil and gas is budgeted at $164 million in fiscal year 1999. Another recent trend in Federal R&D is a tendency for Congress to mandate research on particular projects. Title XIII of the Energy Policy Act of 1992 wrote much of DOE’s coal R&D program into law and added some new areas of research, mandating R&D on coal-fired diesel engines, nonfuel coal use, coalbed methane, metallurgical coal development, coal gasification, coal liquefaction, lowrank coal use, and magnetohydrodynamic power generation. There are similar detailed provisions throughout the law for research on other energy sources, including nuclear power, end use, and renewable energy. Nuclear Power Figure 4 Illustrates trends in DOE’s nuclear power R&D programs. DOE received an appropriation of $640 million for nuclear R&D in fiscal year 1999, but the majority of the funds ($466.6 million) are allocated to the cleanup of contaminated nuclear energy and research sites. About two-thirds of the cleanup funds are being used for site closures, and the balance is slated for site and project completion. Non-Defense Environmental Safety and Health A substantial portion of Government-funded nuclear R&D is for managing and addressing the environmental legacy resulting from nuclear energy and research activities. The goal is to clean up as many contaminated sites as possible by 2006. For fiscal year 1999, more than one-half of nondefense environmental, safety, and health funds are allocated for site closures. Improving Existing Power Plants and Enhancing Nuclear Power The Nuclear Energy Research Initiative provides funds for R&D at universities, national laboratories, and industry to advance nuclear power technology. It includes proliferation-resistant reactor and fuel technologies, highperformance, high-efficiency reactor technology, advanced nuclear fuels, and new technologies for the minimization and management of nuclear waste. The fiscal year 1999 appropriation for this program is $19 million, out of the $30 million for new or improved nuclear power plants.

#### Prefer it -

#### Over limiting – excluding new reactor type slays the most fertile source of aff ground – kills innovation which is key to creativity and education about the topic

#### Functional limits check topic explosion and guarantee ground

#### Predictability outweighs – our aff relies on the most precise vision of how nuclear power functions and is from the EIA which is most qualified

#### Reasonability –competing interps are bad and cause a race to the bottom that destroys substantive debate

### Solvency – AT: Cost Overruns

#### The aff solves -- increasing nuclear construction drives down costs and prevents overruns.

**Spencer, ‘8**

[Jack, Research Fellow in Nuclear Studies -- The Heritage Foundation, 3-19, “Finland's Rational Approach to Nuclear Power,” http://www.heritage.org/Research/Energyandenvironment/bg2117.cfm]

Critics have questioned the economic viability of nuclear power based on delays associated with Fin­land's reactor.[8] At $1.4 billion over budget and two years behind schedule, Finland's reactor has had its problems.[9] However, these delays and cost overruns are not necessarily indicative of the future economic viability of nuclear power. Olkiluoto 3 is a first-of-a-kind, large, multibil­lion-dollar power station. Assigning all of the costs of the first plant to future plants would not be accuate. Construction costs will be reduced as lessons learned from initial construction projects are inte­grated into future ones. Some of the overruns are simply a reflection of rising labor and material costs. These increases, which are not unique to the nuclear industry, would affect any project. Building the 3,200 windmills that would be needed to produce the same amount of electric­ity as Olkiluoto 3 will produce would likely suffer from the same price volatility.[10] A lack of skilled personnel, shortages of nuclear-qualified components and materials, and inexperi­enced vendors and subcontractors have also slowed progress.[11] Very few reactors have been ordered over the past three decades, and the industrial base and skill sets are simply not yet available to support the growing demand for commercial nuclear power. Although these risks should have been expected for a project like Olkiluoto 3, they are also correctable and will be resolved by the market over time**.**¶ As backlogs are created by new orders, nuclear suppliers will invest to expand capacity. For exam­ple, Japan Steel Works has already announced that it will expand its capacity to produce the large forg­ings used to manufacture reactor components. It is the sole supplier of these forgings on the world mar­ket. Other companies have made similar announce­ments to provide expanded uranium enrichment, mining, manufacturing, and used-fuel services. This growth in capacity will eventually meet demand and moderate some of the inflationary pressures that are driving up costs for Finland's newest reactor.

### Prolif

#### Nuclear power is inevitable – Inaction on IFRs is killing US nuclear leadership

**Shuster 11** [Joseph Shuster, founder of Minnesota Valley Engineering and Chemical Engineer, 9-8-2011, "Response to Draft Report From Obama’s Blue Ribbon Commission (BRC) on America’s Nuclear Future dated July 29, 2011," Beyond Fossil Fools]

Contrary to the commission’s declarations on the matter, the U.S. is in danger of losing its once ¶ strong nuclear leadership. As a result we would have less to say about how nuclear materials are ¶ to be managed in the world and that could expose the U.S. to some inconvenient if not downright ¶ dangerous consequences. China is now building a large pilot plant said to be identical to our ¶ successful EBR-II plant that proved the design of the IFR. Meanwhile in the U.S. after complete ¶ success, EBR II was shut down, not for technical reasons but for political reasons during the ¶ Clinton administration, a decision destined to be one of the worst in our nation’s history.¶ Much of the world is already committed to a nuclear future with some countries eagerly waiting ¶ to license the American version of Generation IV Fast Reactors—the IFR. We still have the best ¶ IFR technology in the world but have squandered much of our lead, partly by allowing a largely ¶ unqualified commission two years of useless deliberation. What we really did was give our ¶ competitors an additional two years to catch up.

#### IFR restores leadership on nuclear issues – key to contain proliferation

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "IFR FaD context – the need for U.S. implementation of the IFR," 2/18/10) http://bravenewclimate.com/2010/02/18/ifr-fad-context/-http://bravenewclimate.com/2010/02/18/ifr-fad-context/

ON THE NEED FOR U.S. IMPLEMENTATION OF THE INTEGRAL FAST REACTOR¶ The IFR ties into a very big picture — international stability, prevention of war, and avoiding “proliferation” (spread) of nuclear weapons.¶ – The need for energy is the basis of many wars, including the ones we are engaged in right now (Iraq and Afghanistan). If every nation had enough energy to give its people a decent standard of living, that reason for conflict would disappear.¶ – The only sustainable energy source that can provide the bulk of the energy needed is nuclear power.¶ – The current need is for more thermal reactors — the kind we now use.¶ – But for the longer term, to provide the growing amount of energy that will be needed to maintain civilization, the only proven way available today is with fast-reactor technology.¶ – The most promising fast-reactor type is the IFR – metal-fueled, sodium-cooled, with pyroprocessing to recycle its fuel.¶ – Nobody knows yet how much IFR plants would cost to build and operate. Without the commercial-scale demo of the IFR, along with rationalization of the licensing process, any claims about costs are simply hand-waving guesses.¶ \* \* \* \*¶ Background info on proliferation (of nuclear weapons). Please follow the reasoning carefully.¶ – Atomic bombs can be made with highly enriched uranium (90% U-235) or with good-quality plutonium (bomb designers want plutonium that is ~93% Pu-239).¶ – For fuel for an LWR, the uranium only has to be enriched to 3 or 4% U-235.¶ – To make a uranium bomb you don’t need a reactor — but you do need access to an enrichment facility or some other source of highly enriched uranium…¶ – Any kind of nuclear reactor can be used to make weapons-quality plutonium from uranium-238, but the uranium has to have been irradiated for only a very short period. In other words, nobody would try to make a plutonium weapon from ordinary spent fuel, because there are easier ways to get plutonium of much better quality.¶ – Plutonium for a weapon not only has to have good isotopic quality, it also has to be chemically uncontaminated. Thus the lightly irradiated fuel has to be processed to extract the plutonium in a chemically pure form. But mere possession of a reactor is not sufficient for a weapons capability — a facility using a chemical process called PUREX is also needed.¶ – Regardless of how many reactors a country has, it cannot have a weapons capability unless it has either the ability to enrich uranium or to do PUREX-type fuel reprocessing.¶ – Therefore, the spread of weapons capability will be strongly inhibited if the only enrichment and reprocessing facilities are in countries that already have a nuclear arsenal.¶ – But that can only happen if countries with reactors (and soon that will be most of the nations of the world) have absolutely ironclad guarantees that they can get the fuel they need even if they can’t make their own, regardless of how obnoxious their political actions might be.¶ – Such guarantees will have to be backed up by some sort of international arrangement, and that can only come to pass if there is effective leadership for the laborious international negotiations that will have to take place. (For a relevant discussion, see here)¶ – At present, the only nation that has a realistic potential to be such a leader is the United States.¶ – But a country cannot be such a leader in the political arena unless it is also in the technological forefront.¶ – The United States used to be the reactor-technology leader, but it abandoned that role in 1994 when it terminated the development of the IFR.¶ – Since then, other nations — China, India, Japan, South Korea, Russia, France — have proceeded to work on their own fast-reactor versions, which necessarily will involve instituting a fuel-processing capability.¶ – Thus the United States is being left behind, and is rapidly losing its ability to help assure that the global evolution of the technology of nuclear energy proceeds in a safe and orderly manner.¶ – But maybe it’s not too late yet. After all, the IFR is the fast-reactor technology with the post promise (for a variety of reasons), and is ready for a commercial-scale demonstration to settle some uncertainties about how to scale up the pyroprocess as needed, to establish better limits on the expected cost of production units, and to develop an appropriate, expeditious licensing process.¶ – Such a demo will require federal seed money. It’s time to get moving.

**CFR 12** [CFR 7-5-2012, "The Global Nuclear Nonproliferation Regime," Council on Foreign Relations]

Nuclear weapons proliferation, whether by state or nonstate actors, poses one of the greatest threats to international security today. Iran's apparent efforts to acquire nuclear weapons, what amounts to North Korean nuclear blackmail, and the revelation of the A.Q. Khan black market nuclear network all underscore the far-from-remote possibility that a terrorist group or a so-called rogue state will acquire weapons of mass destruction or materials for a dirty bomb.¶ The problem of nuclear proliferation is global, and any effective response must also be multilateral. Nine states (China, France, India, Israel, North Korea, Pakistan, Russia, the United Kingdom, and the United States) are known or believed to have nuclear weapons, and more than thirty others (including Japan, Germany, and South Korea) have the technological ability to quickly acquire them. Amid volatile energy costs, the accompanying push to expand nuclear energy, growing concerns about the environmental impact of fossil fuels, and the continued diffusion of scientific and technical knowledge, access to dual-use technologies seems destined to grow.¶ In the background, a nascent global consensus regarding the need for substantial nuclear arms reductions, if not complete nuclear disarmament, has increasingly taken shape. In April 2009, for instance, U.S. president Barack Obama reignited global nonproliferation efforts through a landmark speech in Prague. Subsequently, in September of the same year, the UN Security Council (UNSC) unanimously passed Resolution 1887, which called for accelerated efforts toward total nuclear disarmament. In February 2012, the number of states who have ratified the Comprehensive Test Ban Treaty increased to 157, heightening appeals to countries such as the United States, Israel, and Iran to follow suit.¶ Overall, the existing global nonproliferation regime is a highly developed example of international law. Yet, despite some notable successes, existing multilateral institutions have failed to prevent states such as India, Pakistan, and North Korea from "going nuclear," and seem equally ill-equipped to check Iran as well as potential threats from nonstate, terrorist groups. The current framework must be updated and reinforced if it is to effectively address today's proliferation threats, let alone pave the way for "the peace and security of a world without nuclear weapons."

### Solvency – AT: Export Restrictions

#### Export reform solves

Glasgow, October 12 [Partner, Pillsbury Winthrop Shaw Pittman LLP on Behalf of the *Nuclear* Energy Institute.NUCLEAR EXPORT CONTROLS A Comparative Analysis of National Regimes for the Control of Nuclear Materials, Components and Technology, <http://www.jdsupra.com/legalnews/nuclear-export-controls-a-comparative-87814/>]

The Obama Administration has recognized that the complexity of the archaic U.S. export control system often defeats its own purposes to facilitate legitimate trade with partners and prevent the diversion of sensitive technologies from intended users. In remarks on the U.S. export control system made on April 20, 2010, to the Business Executives for National Security, then-Secretary of Defense Robert Gates stated: The problem we face is that the current system, which has not been significantly altered since the end of the Cold War, originated and evolved in a very different era with a very different array of concerns in mind. … The current arrangement fails at the critical task of preventing harmful exports while facilitating useful ones. Following Secretary Gates’ remarks, the Administration launched the Export Control Reform (ECR) Initiative, with a stated objective of fundamentally reforming the U.S. export control system. The cornerstone of the ECR Initiative is to rebuild the two U.S. export control lists: the CCL, which forms part of the Export Administration Regulations, and the ITAR’s U.S. Munitions List. The ECR Initiative’s goal is to create a single control list, single licensing agency, unified information technology system, and enforcement coordination center.26

#### And, cost competition key

Rosner, 11 [Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S, Robert Rosner and Stephen Goldberg Energy Policy Institute at Chicago The Harris School of Public Policy Studies Contributor: Joseph S. Hezir, Principal, EOP Foundation, Inc. Technical Paper, Revision 1 November, 2011, <https://epic.sites.uchicago.edu/sites/epic.uchicago.edu/files/uploads/EPICSMRWhitePaperFinalcopy.pdf>]

Previous studies have documented the potential for a significant export market for U.S. SMRs, mainly in lesser developed countries that do not have the demand or infrastructure to accommodate GW-scale LWRs. Clearly, the economics of SMR deployment depends not only on the cost of SMR modules, but also on the substantial upgrades in all facets of infrastructure requirements, particularly in the safety and security areas, that would have to be made, and as exemplified by the ongoing efforts in this direction by the United Arab Emirates (and, in particular, by Abu Dhabi). This is a substantial undertaking for these less developed countries. Thus, such applications may be an attractive market opportunity for FOAK SMR plants, even if the cost of such plants may not have yet achieved all of the learning benefits.

#### If we answered licensing, we answered this argument

**NRC 12** [“Export-Import”, United States Nuclear Regulatory Commission, March 29, 2012, <http://www.nrc.gov/about-nrc/ip/export-import.html>]

The commodities under NRC export licensing authority (10 CFR 110.8 and 110.9) include the following:

nuclear reactors (10 CFR 110 Appendix A)

uranium enrichment facilities (10 CFR 110 Appendices B-H)

spent fuel reprocessing plants (10 CFR 110 Appendix I)

uranium and plutonium conversion plants (10 CFR 110 Appendix J)

heavy water or deuterium production plants (10 CFR 110 Appendix K)

nuclear fuel fabrication plants (10 CFR 110 Appendix O)

lithium isotope separation facilities (10 CFR 110 Appendix N)

equipment, component parts, and assemblies that are especially designed or prepared for exclusive use in any of the aforementioned facilities

special nuclear material (e.g., plutonium, enriched uranium, uranium-233)

source material (e.g., natural and depleted uranium, thorium)

byproduct material (10 CFR 110 Appendix L and Appendix P)

deuterium (heavy water)

nuclear grade graphite for nuclear end use (see 70 FR 41937, July 21, 2005)

### Solvency – AT: Natural Gas

#### Gas supply crunch coming now – shale production ceilings and economics

Nelder, 12 [Chris, Smart Planet, February, Everything you know about shale gas is wrong, <http://www.smartplanet.com/blog/energy-futurist/everything-you-know-about-shale-gas-is-wrong/341>]

But now there’s even more bad news: U.S. gas production appears to have hit a production ceiling, and is actually declining in major areas. The startling revelation comes from a new [paper](http://www.theoildrum.com/node/8914) published today by Houston-based petroleum geologist and energy sector consultant Arthur Berman. Berman reached this conclusion by compiling his own production history of U.S. shale gas from a massive data set licensed from data provider HPDI. His well-by-well analysis found that total U.S. gas production has been on an “undulating plateau” since the beginning of 2009, and showed declines in some areas in 2011. This stands in stark contrast to recent data provided by the EIA, which shows shale gas production rising steadily for the past two years, and well into the future. The EIA’s forecast is bullish because it’s mainly a view of demand, without great regard for supply limits. But their historical supply data differs for a reason that will be no surprise to experienced observers: the data is bad. The EIA gets its data on shale gas production by sampling the reports of major operators, then applying a formula to estimate how much gas is actually being produced, according to Berman. This may explain why they only have official monthly historical production data for the [two years](http://www.eia.gov/dnav/ng/hist/ngm_epg0_fgs_nus_mmcfm.htm) (unofficially, [three](http://www.eia.gov/dnav/ng/ng_prod_shalegas_s1_a.htm)) of 2008 and 2009, and only annual data for 2010 and 2011. This has been a big red flag to me in my recent work on shale gas, accustomed as I am to EIA’s far more detailed and up-to-date monthly and weekly data on oil, and has made it nearly impossible to verify the claim that we’ve had “booming” gas production over the past two years. Data is also available directly from the states, but some states haveflawed reporting processes**,** the granularity and reporting frequency varies (as low as every six months, in the case of Pennsylvania), and ultimately the data isn’t available in a usable format. It’s also inaccurate and incomplete, as one Pittsburgh newspaper recently [found out](http://www.post-gazette.com/pg/12008/1202172-503-0.stm). Berman reached the same conclusion, noting in his paper that “the data that EIA makes available does not have sufficient resolution to evaluate individual plays or states.” So he had to build his own database. An unprofitable treadmill One reason for the recent slowdown in production growth is that “unconventional” shale gas wells have to make up for the decline of conventional gas wells, which has accelerated from 23 percent per year in 2001 to 32 percent per year today. The U.S. now needs to replace 22 billion cubic feet per day (Bcf/d) of production each year just to maintain flat supply. Currently, all shale gas plays together produce around 19 Bcf/d. The shift to unconventional gas has put us on a production treadmill: We have to keep drilling like mad to maintain output because unconventional wells are far less productive and shorter-lived than conventional gas wells. Berman observes that an average gas well in Texas in 2010 produces one-fifth as much gas as an average conventional gas well did in 1972. In 1972, 23,000 gas wells produced 7.5 trillion cubic feet in Texas; in 2010, it took 102,000 wells to produce 6.4 trillion cubic feet. Another reason was that the spurt of production created a gas glut and drove prices far below the level of profitability. Data from a January, 2012 [presentation](http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NDUxNzk4fENoaWxkSUQ9NDc2OTUwfFR5cGU9MQ==&t=1) by the CEO of gas operator Range Resources showed that gas needs to sell for at least $4 per million BTU in order for operators to turn a profit. Source: Jonathan Callahan, [The Oil Drum](http://www.theoildrum.com/node/8900). Data from Range Resources. Berman is certain that the $4 threshold applies to new drilling on existing plays only; after accounting for land leasing, overhead and debt service, the threshold would be much higher. In any case, we can see that production flattened out when prices fell below $4 at the beginning of 2009. Source: Arthur Berman. Data from Natural Gas Intelligence. A gas price below $3 spells real trouble for operators, and flagging production is but the first effect. The next is debt: According to analysis by ARC Financial Research, the 34 top U.S. publicly traded shale gas producers are currently carrying a combined $10 billion quarterly cash flow deficit. And finally, there will the destruction of forward supply, as new development grinds down. Financing further development with debt in this environment will be extremely difficult, and eventually even the joint-venture sugar daddies that have sustained operators over the past few months will get cold feet. Without a reversal in price, gas production is guaranteed to decline. The gas gold rush is over Indeed, Berman concludes that “the gold rush is over at least for now with the less commercial shale plays.” Within the major producing areas of the U.S., which account for 75 percent of production, all except Louisiana have been either flat or declining in recent years. Overall, he sees evidence that 80 percent of existing U.S. shale gas plays are already approaching peak production. Rig counts have been falling, and major operators such as Chesapeake Energy and ConocoPhilips have announced slowdowns in drilling in the last month. The two major plays that do not show evidence of peaking yet are the newer ones: the Marcellus Shale in Pennsylvania and the Haynesville Shale in Louisiana. To see the influence of these two plays on overall production, compare the first chart below, which shows production from all shale plays, to the second, which removes production from those two plays: Source: Arthur Berman Source: Chart by Chris Nelder, from Arthur Berman’s worksheets The Haynesville surpassed the Barnett Shale in Texas last year as the top-producing shale play in the U.S., but it may be reaching a production plateau now. Worse, Berman’s analysis finds that despite its impressive production, the Haynesville is among the least economic of the shale plays, requiring gas prices above $7.00 per thousand cubic feet to sustain new drilling profitably, and nearly $9.00 per thousand cubic feet after accounting for leasing and other costs. (One thousand cubic feet is roughly equivalent to one million BTU.) A word of caution is in order here: A one-year decline in production in an unprofitable environment is not proof that shale gas has “peaked.” It’s certainly possible that renewed drilling could bring higher production when gas prices rise again. The operative question in that case is when. If gas prices recover within the next year or two, it will be relatively easy to bring new wells online rapidly. But if gas prices languish for longer than that, the most productive “core” areas of the plays could become exhausted because the wells deplete so quickly. Without sustained new drilling to replace their production, by the time producers begin drilling again in the remaining, less productive prospects, an air pocket could form in the supply line. Disinformation and diffusion theory Berman admits that it’s strange for his bottom-up analysis to produce results that are so wildly divergent from the claims of the operators and the data offered by the EIA. “I ask myself: Where could we be wrong?” he explained. “We’ve looked at the individual wells and it looks like they’ll produce less gas than the operators say, so where could we be wrong? Likewise on cost: There are no retained earnings, so how could they be saying they’re profitable?” Having scrutinized the financial reports of operators, Berman concludes that operators are being honest with the SEC, because if they aren’t, somebody will go to jail. But then they’re telling a very different story to the public, and to investors, particularly regarding their costs. This isn’t necessarily nefarious; it’s really just a way of working around the natural risks associated with new resource development. They’re playing for the future, not for immediate profitability. Early wildcatters gambled on debt-fueled drilling with the hope that they’d be able to hold the leases long enough to see prices rise again and put them nicely in the black, or flip them at a profit to someone who could. And the profit picture is substantial: according to the Range Resources presentation, when gas is $6, they’ll be realizing a 135 percent internal rate of return. “I think these companies realize—clearly—that the U.S. is moving toward a gas economy,” Berman observes. “The natural gas industry has been very successful at screwing up the coal industry. . . a huge part of the demand is from the power generation business. The President now thinks, incorrectly, that we’ve got 100 years of natural gas. [Op’erators think] ‘If we can just get all this land held, drilled, etc., then in a couple of years when the price recovers we’re going to make a fortune’. . . and they’re right!” I am inclined to agree. My own analysis suggests that [gas is trouncing coal](http://www.smartplanet.com/blog/energy-futurist/regulation-and-the-decline-of-coal-power/275) in the power generation sector. I am also strongly [against exporting LNG](http://www.smartplanet.com/blog/energy-futurist/the-siren-song-of-lng-exports/313), because it will increase domestic costs across the board, another point on which Berman and I agree. “If they go through with the permits to export LNG, then that’s gonna seal it,” he remarked. “All you have to do is commit to 20-year contracts to ship a few bcf per day. . . I fear what’s really going to happen is that we’re going to have to start importing LNG.” Ultimately, we have to ask why there seems to be such an enormous disconnect between the reality of the production and reserve data, and the wild-eyed claims of operators and politicians. Berman’s answer is blunt: “We’re in a weird place where it’s not in anybody’s vested interest to say that things aren’t wonderful,” he said, and went on to relate a few stories of his encounters with politicians. They admitted to him, straight-up, that they can’t tell the public the truth about energy issues like gas reserves and peak oil because nobody wants to hear it, and they’ll just wind up getting voted out of office. “This gets back to basic diffusion theory,” Berman muses, “where only 5 percent of people base their decisions on information, while the other 95 percent make decisions on what everybody else thinks.” That sounds right to me. It benefits everyone involved to tell happy lies, and benefits no one to own up to the current reality. That is true for everyone from the operators right on up to the President. Perhaps in the end—like government—we’ll simply get the energy policy we deserve.

### ADv CP 2AC

#### Renewables fail

Zehner 6/12Visiting scholar at the University of California, MS in Science and Technology Studies)(Ozzie Zehner, June 12, 2012, “Solar Cells and Wind Turbines Don't Offset Fossil Fuel Use, According to New Book, Green Illusions,” The Wall Street Journal, [http://www.marketwatch.com/story/solar-cells-and-wind-turbines-dont-offset-fossil-fuel-use-according-to-new-book-green-illusions-2012-06-12)//DR](http://www.marketwatch.com/story/solar-cells-and-wind-turbines-dont-offset-fossil-fuel-use-according-to-new-book-green-illusions-2012-06-12%29//DR). H

BERKELEY, Calif., June 12, 2012 /PRNewswire via COMTEX/ -- Renewable energy technologies *do not offset* fossil fuel use in the United States according to a new environmental book, Green Illusions (June 2012, University of Nebraska Press), by University of California - Berkeley visiting scholar Ozzie Zehner. In fact, building more solar cells and wind turbines could actually *accelerate* fossil fuel use unless nations take other steps to avoid a rebound effect. Many renewable energy researchers assume that building solar cells and wind farms will displace coal use and lower carbon dioxide levels. However, Zehner explains that subsidizing renewable energy merely expands energy supplies, which exerts a downward pressure on prices. Energy demand subsequently increases. "This brings us right back to where we started: high demand and so-called insufficient supply," says Zehner. "Historically, we've filled that added demand by building more coal-fired power plants, not fewer." "We create an energy boomerang," Zehner remarked during a recent PBS interview. "The harder we throw energy into the grid, the harder demand comes back to hit us on the head. More efficient solar cells, taller wind turbines, and advanced biofuels are all just ways of throwing harder."

#### No investment or solvency for renewables now

Floyd, 9/28/12 [The Gadsden Times, director of United Kingdom manufacturing, Goodyear Tire & Rubber Co., vice president of manufacturing and international operations, General Tire & Rubber Co., and director of manufacturing, Chrysler Corp, <http://www.gadsdentimes.com/article/20120928/NEWS/120929802>]

Energy contributions by solar and wind to the U.S. power grid are miniscule when compared to coal, oil and gas, hydro and nuclear. In addition, the renewable energies are not cost effective and it is doubtful they will be.¶ In a recent article in The Gadsden Times, a writer complained that one of the major issues for wind and solar was states lagging in incentives for solar and wind. ¶ Was the writer joking, or did he not understand that huge governmental subsidies for solar and wind power come from taxpayer dollars? ¶ The U.S. Department of Energy reported that federal subsidies for solar are $775 per megawatt hour and for wind $57 per megawatt hour. Conversely, subsidies for oil and gas are $0.64 cents per megawatt hour, hydro power was $0.82 cents, coal $0.64 cents and nuclear $3.14 per megawatt hour. The difference in the subsidy for wind and solar versus traditional energy sources is obscene.¶ In 2011 the wind turbine industry received $5 billion in subsidies, in spite of the fact it produced only 2.3 percent of the total energy used in the United States. ¶ The Wall Street Journal reported in its Aug. 18 opinion page that for every tax dollar that goes to coal, oil and natural gas, wind gets $88 and solar $1,212. Subsidy comparisons don’t consider that the oil, coal,and natural gas industries paid more than $10 billion in taxes in 2009. Wind and solar are net drains on the United States Treasury.¶ The Journal suggested that maybe it is time to eliminate all federal subsidy programs for the energy industry. This is a proposal that should be taken very seriously. Why subsidize industries that historically generate huge profits? ¶ An Indiana newspaper reported that the company E-on Climate & Renewables is in a race against time for construction of 125 wind turbines in the Tipton, Ind., area. E-on is concerned federal subsidies they now enjoy will expire at the end of 2012. That’s unlikely because subsidies for wind and solar have been around since 1992 and have been extended seven times.¶ E-on has stated that each wind turbine will generate enough electrical power for 350 homes. So it would follow that 125 turbines will generate enough power to supply 43,750 homes. This is more than enough electrical power for all of Tipton and Kokomo, Ind.¶ The problem is the cost of the power. If the two communities had to pay for the power without taxpayer help, it would bankrupt every family living in the two communities.¶ What about times when there is no wind to power the turbines? Would these communities have to supplement electrical needs with power from alternative sources?¶ As utilization goes down for traditional electrical suppliers, unit costs go up. This means that alternative power supplied by traditional sources would also increase in cost. Tipton and Kokomo would be caught in a “Catch 22.” Implementation of wind turbines is a loser for the American taxpayer until the supplies of coal, natural gas and oil are depleted. Even then new nuclear power plants could supply 90 percent or more of the United States demand. ¶ Wind farms are “feel-good projects” with enormous associated costs to the American taxpayer. For irrelevance, wind farms are only exceeded by the solar industry. Sometimes, it is not good to be No. 1. ¶ To answer the question are American taxpayers lagging in incentives for renewable energy sources? I don’t think so.¶ I understand startup costs and the time it takes to establish appropriate operating numbers. Wind and solar power are far removed from the realm of cost effectiveness. ¶ There is much doubt wind and solar will be more than a drop in the ocean in relation to contributing to power requirements for the United States.

#### Conditionality is bad – generates 2ac strategic skew by disincentivizng best use of offense – creates argumentative irresponsibility making debate poor advocate training – rigorous pre-round research solves offense

### States CP 2AC

#### States don’t solve –

#### One, scope – Manhattan approach requires billions of dollars of investment –federal support is necessary to ensure stable financial commitments – marshals resources behind the technology – that’s Woolner

#### And, this argument slays the counterplan – no funding mechanism can keep up

Duderstadt, 09 [ENERGY DISCOVERY-INNOVATION INSTITUTES: ASTEP TOWARD AMERICA’S ENERGY SUSTAINABILITY . By James Duderstadt, Gary Was, Robert McGrath, Mark Muro, Michael Corradini, Linda Katehi, Rick Shangraw, and Andrea Sarzynski February, Metropolitan Policy Center Brookings, <http://www.brookings.edu/~/media/research/files/blogs/2011/8/11%20michigan%20bradley/0209_energy_innovation_muro_full.pdf>]

And yet, most state and local governments have limited capacity to expand their efforts. Budgets were already tight before the current economic downturn, forcing energy investments to compete with other policy priorities, such as transportation, education, and health care. The sheer scale of the nation’s energy challenges calls for a substantially larger pool of resources than state and local governments can devote to energy. Consequently, the public responsibility for driving a fundamental energy transformation in America falls largely to the federal government. Federal leadership on energy policy is appropriate in part given the federal government’s historic responsibilities for environmental protection and economic and national security. But the case for federal involvement goes beyond simple tradition and reflects the vast scale and boundary-crossing complexity of the problem. Beyond that, it reflects the fact that only national governments can ensure adequate provision of certain public goods that make the entire nation better off but might not otherwise be adequately produced.87 Basic and pre-commercial scientific R&D, national security, and environmental protection are all public goods that are not sufficiently provided by the private market and so require public attention. Yet, state and local efforts towards these ends, on their own, will always be thin and uneven. The federal government tried for decades to influence business practices and state policies with financial carrots before it set national standards to ensure environmental quality.88 Federal responsibility over energy and the environment has therefore grown as business increasingly shifts from the local level to the global level and as the external effects of commerce, including air pollution and greenhouse gas emissions, extend beyond the control of local and state governments. 27 Brookings · February 2009 In short, gaps in pricing and regulatory responses, the insufficiency of private investment, and the inability of most states and local governments to engage at the levels needed all place significant responsibility for investment in energy innovation in the lap of the federal government.

#### And, that means only the plan is certain – key to deployment

Duderstadt, 09 [ENERGY DISCOVERY-INNOVATION INSTITUTES: ASTEP TOWARD AMERICA’S ENERGY SUSTAINABILITY . By James Duderstadt, Gary Was, Robert McGrath, Mark Muro, Michael Corradini, Linda Katehi, Rick Shangraw, and Andrea Sarzynski February, Metropolitan Policy Center Brookings, <http://www.brookings.edu/~/media/research/files/blogs/2011/8/11%20michigan%20bradley/0209_energy_innovation_muro_full.pdf>]

The need to renew America’s economy, foster its energy security, and respond to global climate change all compel the transformation of U.S. energy policy. It is now largely agreed that massive technology changes will be needed to stabilize greenhouse gas emissions worldwide. Innovation and its dispersal through commercialization must therefore move to the center of national reform. Not only must a broad range of pricing, regulatory, and infrastructure responses be adopted, but massive direct investments in the innovation process are essential. And yet, the scale and intensity of current energy innovation efforts in the United States remain inadequate to produce the needed technological progress and human capital development. Both private and public sources have underinvested in energy research in the past and now the nation faces acute, increasingly urgent challenges as it moves to address the complex challenges posed by global climate change. In all of this, serious market and government failures in the U.S. and elsewhere have so far prevented the private and public sectors from making sufficient investments in energy innovation. Most notably, relatively low energy prices—in the absence of national carbonpricing interventions and notwithstanding several oil price spikes over the past 40 years—have for decades reduced the incentive for companies to invest in clean and efficient energy technologies and processes. Similarly, the reality of spillover benefits and other market realities mean that individual firms can rarely capture all of the benefits of their innovative activity, which also leads to underinvestment and a focus on short-term, low-risk research and product development. Uncertainty and insufficient information on energy pricing, policy, and the features of new technology or processes may further delay innovation. Additionally, states and localities usually lack the wherewithal to engage systematically over the long time horizons needed to catalyze inventions. The upshot of all this is clear: The insufficiency of private investment and the inability of most states and local governments to engage adequately—in the absence of a high price on carbon or sufficient regulatory interventions—places the responsibility for guaranteeing adequate levels of energy innovation largely in the lap of the federal government. 6 Brookings · February 2009 Such an assignment of responsibility is appropriate, moreover, given the federal government’s historic responsibilities for environmental protection and economic and national security. However, both the magnitude and character of federal energy innovation programs remain inadequate to address the development of a sustainable energy economy in America. Current industry and government investments in energy-sector research and development (R&D) are clearly too low, given the urgency of the energy challenges facing the nation. For its part, the energy industry lags most other major U.S. industries in the fraction of its revenues devoted to R&D. For that reason, private firms should be enticed both through federal tax incentives and other investments to increase R&D activities to a level comparable to other technology-intensive industries such as electronics, defense, and health care. On the government side, meanwhile, which is dominated by the federal government’s activities, the federal investment in energy R&D today amounts to a bit more than $2 billion per year—less than one-fifth of the funding levels of the 1970s and 1980s. Given the large size of the energy sector ($1.4 trillion per year) and the sheer complexity and urgency of the nation’s energy challenges, it would seem that the federal investment in energy R&D should be increased substantially to levels comparable to those associated with other compelling national priorities such as health care, national defense, and space exploration. Such a prioritization argues for federal energy investment in the neighborhood of $20 to $30 billion per year. In response, this report proposes a significant increase in the scale of the federal government’s energy R&D activities. To be specific, the pages that follow call for an order of magnitude growth in annual federal investments that would increase to $20 to $30 billion the nation’s roughly $2 billion-plus current effort on non-defense energy-related R&D. Along these lines, the paper assumes that the bulk of the nation’s needed new investment would flow to the nation’s existing federal laboratories and associated corporate R&D centers.

#### And, the cp doesn’t centralize leadership - causes delays because of ineffective coordination – that’s Alexander – ORNL says presidential involvement spurs effective coordination, use of federal laboratories critical to tech deployment

**And, federal labs key**

MIT, 10 [Massachusetts Institute of Technology, “Nuclear Energy Research and Development Roadmap: Report to Congress”, April 2010, http://ocw.mit.edu/courses/nuclear-engineering/22-033-nuclear-systems-design-project-fall-2011/readings/MIT22\_033F11\_read\_core\_doe.pdf]

 In the United States, it is the responsibility of industry to design, construct, and operate commercial nuclear power plants. However, DOE has statutory authority under the Atomic Energy Act to promote and support nuclear energy technologies for commercial applications. In general, appropriate government roles include researching high-potential technologies beyond the investment horizon of industry and also reducing the technical risks of new technologies. In the case of new commercial reactor designs, potential areas of NE involvement could include: Enabling new technologies to be inserted into emerging and future designs by providing access to unique laboratory resources for new technology development and, where appropriate, demonstration. • Working through the laboratories and universities to provide unique expertise and facilities to industry for R&D in the areas of: o Innovative concepts and advanced technologies. o Fundamental phenomena and performance data. o Advanced modeling and simulation capabilities. APRIL 2010 22 34 NUCLEAR ENERGY RESEARCH AND DEVELOPMENT ROADMAP o New technology testing and, if appropriate, demonstration. o Advanced manufacturing methods. Representative R&D activities that support each of the roles stated above are presented below. The level of DOE investment relative to industry investment will vary across the spectrum of these activities, with a generally increasing trend in DOE investment for longer-term activities. Finally, there is potential to leverage and amplify effective U.S. R&D through collaborations with other nations through multilateral and bilateral agreements including the Generation IV International Forum, which is investigating multiple advanced reactor concepts. DOE is also a participant in OECD/NEA and IAEA initiatives that bear directly on the development and deployment of new reactor systems.

#### And, policy through the DOE is essential to create effective international norms and spur tech development

MIT, 10 [Massachusetts Institute of Technology, “Nuclear Energy Research and Development Roadmap: Report to Congress”, April 2010, http://ocw.mit.edu/courses/nuclear-engineering/22-033-nuclear-systems-design-project-fall-2011/readings/MIT22\_033F11\_read\_core\_doe.pdf]

A goal-driven, science-based approach is essential to achieving the stated objectives while exploring new technologies and seeking transformational advances. This science-based approach, depicted in Figure 1, combines theory, experimentation, and high-performance modeling and simulation to develop the fundamental understanding that will lead to new technologies. Advanced modeling and simulation tools will be used in conjunction with smaller-scale, phenomenon-specific experiments informed by theory to reduce the need for large, expensive integrated experiments. Insights gained by advanced modeling and simulation can lead to new theoretical understanding and, in turn, can improve models and experimental design. This R&D must be informed by the basic research capabilities in the DOE Office of Science (SC). NE maintains access to a broad range of facilities to support its research activities. Hot cells and test reactors are at the top of the hierarchy, followed by smaller-scale radiological facilities, specialty engineering facilities, and small non-radiological laboratories. NE employs a multi-pronged approach to having these capabilities available when needed. The core capabilities rely on DOE-owned irradiation, examination, chemical processing and waste form development facilities. These are supplemented by university capabilities ranging from research reactors to materials science laboratories. In the course of conducting this science-based R&D, viii APRIL 2010 10 NUCLEAR ENERGY RESEARCH AND DEVELOPMENT ROADMAP infrastructure needs will be evaluated and considered through the established planning and budget development processes. There is potential to leverage and amplify effective U.S. R&D through collaboration with other nations via multilateral and bilateral agreements, including the Generation IV International Forum. DOE is also a participant in Organization of Economic Cooperation and Development/Nuclear Energy Agency (OECD/NEA) and International Atomic Energy Agency (IAEA) initiatives that bear directly on the development and deployment of new reactor systems. In addition to these R&D activities, international interaction supported by NE and other government agencies will be essential in establishment of international norms and control regimes to address and mitigate proliferation concerns.

#### Only federal investment overcomes development barriers

MIT, 10 [Massachusetts Institute of Technology, “Nuclear Energy Research and Development Roadmap: Report to Congress”, April 2010, http://ocw.mit.edu/courses/nuclear-engineering/22-033-nuclear-systems-design-project-fall-2011/readings/MIT22\_033F11\_read\_core\_doe.pdf]

Today, the key challenges to the increased use of nuclear energy, both domestically and internationally, include: The capital cost of new large plants is high and can challenge the ability of electric utilities to deploy new nuclear power plants. The exemplary safety performance of the U.S. nuclear industry over the past thirty years must be maintained by an expanding reactor fleet. There is currently no integrated and permanent solution to high-level nuclear waste management. International expansion of the use of nuclear energy raises concerns about the proliferation of nuclear weapons stemming from potential access to special nuclear materials and technologies. In some cases, there is a necessary and appropriate federal role in overcoming these challenges, consistent with the primary mission of NE to advance nuclear power as a resource capable of making major contributions to meeting the nation’s energy supply, environmental, and energy security needs. This is accomplished by resolving technical, cost, safety, security and proliferation resistance barriers, through research, development, and demonstration, as appropriate. NE’s research and development (R&D) activities will help address challenges and thereby enable the deployment of newreactor technologies that will support the current fleet of reactors and facilitate the construction of new ones.

### AT: Meltdowns DA

Brook ev

#### IFR’s are safe and meltdown-proof [sodium coolant, passive shut-down]

Archambeauet all 11 [The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs, Charles Archambeau, Science Council for Global Initiatives, Randolph Ware, Cooperative Institute for Research in Environmental Sciences, Tom Blees, National Center for Atmospheric Research, Barry Brook, University of Adelaide, Jerry Peterson, Argonne National Laboratory,¶ Yoon Chang, University of Colorado, February 2011]

The IFR fast reactor uses metal fuel rather than one of the oxide fuels which are used in¶ LWR and other Generation II and III reactors. The metal fuel expands when heated, so in¶ the event of accidental reactor core over-heating, the density of the metal fuel will rapidly¶ decrease and cause a rapid drop in the number of neutron collisions with Uranium atoms¶ per unit volume of fuel. This drop will result in a termination of the nuclear chain reaction.¶ Hence reactor core overheating from any cause will result in a fuel density decrease¶ followed by a termination of the chain reaction and the automatic shut down of the reactor.¶ This whole reaction chain is called a passive shut-down because no operator action, or¶ automatic electronic sensor driven feed-back system, is needed. This passive safety feature¶ is an important and robust addition to fast reactor operational safety which is not found in¶ LWR and other open cycle reactors. Consequently, the resistance to core melt-down in¶ these IFR reactors is extremely high, with near vanishing probability of such an event¶ occurring in the life-time of the reactor. As well as metal fuel use, the IFR uses metal¶ coolant (sodium preferred) which allows safe operation at high output temperatures leading¶ to greater efficiency and lower reactor fabrication costs. The IFR metal coolant pool is also¶ a large heat sink which safely absorbs the excess heat in the reactor core after passive shutdown.

#### Extinction impact is empirically denied by Fukushima, and Chernobyl

Bosselman, ‘7 [Fred, Professor of Law Emeritus, Chicago-Kent College of Law, “THE NEW POWER GENERATION: ENVIRONMENTAL LAW AND ELECTRICITY INNOVATION: COLLOQUIUM ARTICLE: THE ECOLOGICAL ADVANTAGES OF NUCLEAR POWER,” 15 N.Y.U. Envtl. L.J. 1, Lexis]

C. "But What About Chernobyl?" In 1986, an explosion at the Chernobyl nuclear power plant in the Ukraine caused the release of large amounts of radiation into the atmosphere. [247](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n247) Initially, the Soviet government released little information about the explosion and tried to play down its seriousness, but this secrecy caused great nervousness throughout Europe, and fed the public's fears of nuclear power all over the [\*46] world. [248](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n248) Now a comprehensive analysis of the event and its aftermath has been made: In 2005, a consortium of United Nations agencies called the Chernobyl Forum released its analysis of the long-term effects of the Chernobyl explosion. [249](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n249) The U.N. agencies' study found that the explosion caused fewer deaths than had been expected. [250](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n250) Although the Chernobyl reactor was poorly designed and badly operated [251](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n251) and lacked the basic safety protections found outside the Soviet Union, [252](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n252) fewer than seventy deaths so far have been attributed to the explosion, mostly plant employees and firefighters who suffered acute radiation sickness. [253](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n253) The Chernobyl reactor, like many Soviet reactors, was in the open rather than in an American type of pressurizable containment structure, which would have prevented the release of radiation to the environment if a similar accident had occurred. [254](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n254) [\*47] Perhaps the most surprising finding of the U.N. agencies' study was that "the ecosystems around the Chernobyl site are now flourishing.The [Chernobyl exclusion zone] has become a wildlife sanctuary, and it looks like the nature park it has become." [255](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n255) Jeffrey McNeely, the chief scientist of the World Conservation Union, has made similar observations: Chernobyl has now become the world's first radioactive nature reserve... . 200 wolves are now living in the nature reserve, which has also begun to support populations of reindeer, lynx and European bison, species that previously were not found in the region. While the impact on humans was strongly negative, the wildlife is adapting and even thriving on the site of one of the 20th century's worst environmental disasters. [256](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n256) Mary Mycio, the Kiev correspondent for the Los Angeles Times, has written a fascinating book based on her many visits to the exclusion zone and interviews with people in the area. [257](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n257) She notes that the fear that radiation would produce permanent deformities in animal species has not been borne out after twenty years; the population and diversity of animals in even some of the most heavily radiated parts of the exclusion zone is similar to comparable places that are less radioactive. [258](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n258)

**And, the most qualified ev proves our argument**

**Amano, 12** [Yukiyo, Director General of the International Atomic Energy Agency, International Status and Prospects for Nuclear Power 2012, <http://www.iaea.org/About/Policy/GC/GC56/GC56InfDocuments/English/gc56inf-6_en.pdf>]

C.2. Prospects in Countries considering the Introduction of Nuclear Power 41. Since the mid-2000s, developing countries have expressed a new or renewed interest in nuclear power. While the Fukushima Daiichi accident caused some countries to change their positions and some to take a ‘wait and see’ approach, interest continued among countries considering or planning for nuclear power introduction. 42. Table C-2 shows the number of countries at different stages of nuclear power consideration or development. Sometimes referred to as ‘nuclear newcomers’, some countries, such as Bangladesh, Egypt and Vietnam, have in fact been planning for nuclear power for some time. Others, such as Poland, are reviving the nuclear power option after plans had been curtailed when governments and public opinion changed. Countries such as Jordan and Uruguay are considering or planning for nuclear power for the first time. What they have in common is that they are all considering, planning or starting nuclear power programmes, and have not connected a first nuclear power plant to the grid. TABLE C-1. Positions of countries with operating nuclear power plants plus Lithuania Category Number of countries New unit(s) under construction with more planned/proposed 11 New unit(s) under construction but the policy for more units is not established 2 No units under construction but with plans/proposals for building new unit(s) 10 No units under construction, and currently no plans/policy for building new units 4 Firm policy not to build new units and/or for closure of existing units 4 TABLE C-2. Positions of countries without operating nuclear power plants8 Description of group Number of Countries 2012 Number of Countries 2010 Number of Countries 2008 Considering a nuclear programme to meet identified energy needs with a strong indication of intention to proceed 14 14 14 Active preparation for a possible nuclear power programme with no final decision 6 7 7 Decided to introduce nuclear power and started preparing the appropriate infrastructure 6 10 5 New nuclear power plant ordered 3 2 0 New nuclear power plant under construction 0 1 1 43. Of the 29 countries considering or planning for nuclear power in 2012, 10 are from the Asia and the Pacific region, 10 are from the Africa region, 7 are in Europe (mostly Eastern Europe) and 2 are in Latin America8 Two additional groups were included in previous editions of this publication but not in this edition because they did not add substantially to an understanding of the rising expectations for nuclear power among developing countries. One group included countries that were not planning to introduce nuclear power but were interested in considering the associated issues, but it proved difficult to characterize trends and there were wide fluctuations in the numbers from year to year. A second group included countries where an invitation to bid to supply a nuclear power plant had been prepared, but this proved problematic because of countries that were choosing to order plants through direct bilateral agreements rather than through bids. GOV/INF/2012/12-GC(56)/INF/6 Page 10 44. Even after the Fukushima Daichii accident, some countries have taken concrete steps toward nuclear power introduction. In the United Arab Emirates (UAE), in 2011, the Emirates Nuclear Energy Corporation invited bids for uranium, conversion and enrichment for the fuel for the UAE’s first reactors. In Turkey, the project company Akkuyu Nukleer Santral Elektrik Uretim filed applications for construction permits and a power generation licence. Belarus signed a contract with the Russian Federation for the construction of two reactors, and Bangladesh signed an intergovernmental agreement with the Russian Federation, also for two reactors. Vietnam signed a loan agreement with the Russian Federation regarding financing of its first nuclear power plant and announced its intention to undertake a similar agreement with Japan. 45. The Islamic Republic of Iran began commissioning of its first nuclear power plant at Bushehr in September 2011, which marked the commissioning of the first nuclear power plant in a ‘newcomer’ country in 15 years. 46. The rate at which new countries joined the list of countries operating nuclear power plants was fairly steady through the early 1980s as shown in Fig. C-1. Until the addition of the Islamic Republic of Iran in 2011, only three countries had connected their first nuclear power plants to the grid in the post-Chernobyl era — China, Mexico and Romania. The countries now planning for their first nuclear power plants are doing so after an experience gap of 15 years. Of the countries considering or planning for their first nuclear plant, 9 have explicitly expressed target dates for the first operation before 2030. FIG. C-1. Number of countries operating, or having operated, nuclear power plants. Source IAEA (PRIS) 47. Overall, Tables C-1 and C-2 are consistent with trends reflected in the Agency’s low and high projections described below, i.e. there remains substantial uncertainty in projections about nuclear power, and the growth in the use of nuclear power is projected to be driven more by expansion in established nuclear power countries than by countries starting nuclear power programmes. The 9 countries that have explicitly expressed target dates for the first operation before 2030 lie between the 7 countries in the Agency’s low projection that would connect their first plant by 2030 and the 16 countries that would do so in the high projection. GOV/INF/2012/12-GC(56)/INF/6 Page 11 C.3. Potential Drivers for the Introduction of Nuclear Power 48. The key factors that have driven rising interest in nuclear power since about 2005, and the increase in construction starts shown in Fig. B-1, have not changed with the Fukushima Daiichi accident: growing energy demand, especially for electricity; volatile fossil fuel prices; environmental pressures and energy security concerns.

### AT: Tax Increases 2AC

#### Doesn’t solve economy

**ENR 9** [7/22/2009, <http://enr.construction.com/opinions/editorials/2009/0722-StifleTheEconomy.asp>, [[Engineering News-Record, Taxing the Wealthy Even More Will Stifle the Economy”] //khirn

As America digs itself deeper into a financial hole, Congress and states are using a venerable political ploy to justify even more spending: increasing taxes on the wealthy and big companies ostensibly to help those with less. That ploy may have worked in the early 1900s when big bosses often were so-called robber barons. Today, however, even people at the bottom of the economic ladder realize wealthy individuals help fuel the nation’s economic development in important ways. The U.S. is a democracy, but wealthy individuals faced with confiscatory taxes can easily vote with their feet by moving their operations and themselves to other states or countries. It is easier than most people think, as demonstrated by the recent trend of corporations moving headquarters to Switzerland to avoid multiple taxation on income. Many construction executives participating in ENR’s construction confidence survey complain about President Obama’s proposed plan to increase taxes on the wealthy and companies to pay for the economic stimulus, health-care reform and pet projects. Enough is enough, they say. “Obama wants to cut open the golden goose to see if there are any more eggs left,” one says. The federal debt now has ballooned past $11.6 trillion, and nations with dollar reserves and investments are nervous. In addition, the federal economic-stimulus program, company bailouts and other guarantees potentially could cost taxpayers up to $23.7 trillion, according to an estimate delivered to the House by the inspector general of the Troubled Asset Relief Program. That does not sit well with people who are used to balancing their books. They also are unhappy about the resurrection of the so-called death tax. Buried in President Obama’s federal budget is an item that keeps the federal estate tax at 2009 levels instead of letting the tax lapse in 2010, as called for in current legislation. This amounts to one of the largest tax hikes in history. Estates of people who already have paid taxes on their earnings can be taxed up to 45%. The fact that the tax applies only to a limited number of people because of exemptions does not help a family that is trying to preserve a construction firm, farm or other business. In the end, what does “wealthy” really mean? When income and other assets are taxed over and over by multiple jurisdictions, wealth evaporates quickly, as does the motivation to accumulate and invest it. When you have to give most of it to the government, it is easier to join the less fortunate. That does nothing for the economy.

### AT: CWIP

#### CWIP creates a unique moral hazard that collapses projects

MVC 2011; Missouri Votes Conservation, non-partisan environmental organization “Nuclear/CWIP” <http://www.movotesconservation.org/our-legislative-work/the-issues/energy/nuclearcwip/>

Why is CWIP unfair to ratepayers? 1. CWIP would allow electric utilities to charge current customers for future projects that are not yet providing any service. 2. CWIP shifts the risk of building power plants from the shareholders to the ratepayers. Essentially, CWIP gives the utility a no-bid, cost-plus contract to build whatever it likes. It requires that ratepayers pay for 100% of an investment for which they have no ownership stake, and if the project fails, ratepayers absorb 100% of the loss. CWIP unfairly shifts the risk to ratepayers without adjusting the guaranteed rate of return a utility already receives for bearing the risk (See “Who should bear the risk” below). If utilities prefer to have ratepayers bear all of their big risks, then their guaranteed rate of return should be eliminated or reduced significantly. When risk is shifted from the utility to the ratepayer, imprudent decisions generally follow. That’s because the same caution utilities exercise to protect their shareholders, they do not exercise for their captive customers: ratepayers. For example, [AmerenUE has admitted publicly that the risk of building a huge new nuclear power plant is not prudent](http://www.stltoday.com/stltoday/business/stories.nsf/story/b6d01162fab4a0f7862574630004a9f8?opendocument) for the company’s shareholders “We just couldn’t do it. The risk would be too great. We don’t think people would lend us the money. We don’t think our board of directors would approve it. And we don’t think our stockholders would think it’s prudent.” 3. CWIP encourages overbuilding by offering an incentive for utilities to build more capacity than ratepayers need, which grows the ratebase for which a utility gets a fixed rate of return. In addition, the excess capacity that ratepayers finance can then be used to increase the utility’s sales on the open market. 4. CWIP passes on the risk and cost to ratepayers of high cost, high risk, large energy supply projects when ratepayers might benefit more from investments in lower cost, lower risk alternatives like energy efficiency and clean renewable energy. These low cost, low risk energy solutions can be implemented incrementally as needed, eliminating the risk of overbuilding. 5. CWIP removes the opportunity for scrutiny and oversight of utility decisions and expenses. Under No-CWIP conditions, utility expenditures are carefully examined before an expense is added to the utility’s rate-base and there is opportunity for PSC staff, the public counsel and consumer groups to challenge the legitimacy of expenditures or the prudency of a planned investment. Under CWIP oversight happens after the expenditure, not before.

### Debt Ceiling 2AC

#### No econ impact

Robert Jervis 11, Professor in the Department of Political Science and School of International and Public Affairs at Columbia University, December 2011, “Force in Our Times,” Survival, Vol. 25, No. 4, p. 403-425

Even if war is still seen as evil, the security community could be dissolved if severe conflicts of interest were to arise. Could the more peaceful world generate new interests that would bring the members of the community into sharp disputes? 45 A zero-sum sense of status would be one example, perhaps linked to a steep rise in nationalism. More likely would be a worsening of the current economic difficulties, which could itself produce greater nationalism, undermine democracy and bring back old-fashioned beggar-my-neighbor economic policies. While these dangers are real, it is hard to believe that the conflicts could be great enough to lead the members of the community to contemplate fighting each other. It is not so much that economic interdependence has proceeded to the point where it could not be reversed – states that were more internally interdependent than anything seen internationally have fought bloody civil wars. Rather it is that even if the more extreme versions of free trade and economic liberalism become discredited, it is hard to see how without building on a preexisting high level of political conflict leaders and mass opinion would come to believe that their countries could prosper by impoverishing or even attacking others. Is it possible that problems will not only become severe, but that people will entertain the thought that they have to be solved by war? While a pessimist could note that this argument does not appear as outlandish as it did before the financial crisis, an optimist could reply (correctly, in my view) that the very fact that we have seen such a sharp economic down-turn without anyone suggesting that force of arms is the solution shows that even if bad times bring about greater economic conflict, it will not make war thinkable.

#### The economy is resilient

**Economist,** Economist Intelligence Unit – Global Forecasting Service, 11/16/’**11**

(<http://gfs.eiu.com/Article.aspx?articleType=gef&articleId=668596451&secID=7>)

The US economy, by any standard, remains weak, and consumer and business sentiment are close to 2009 lows. That said, the economy has been surprisingly resilient in the face of so many shocks. US real GDP expanded by a relatively robust 2.5% in the third quarter of 2011, twice the rate of the previous quarter. Consumer spending rose by 2.4%, which is impressive given that real incomes dropped during the quarter (the savings rate fell, which helps to explain the anomaly.) Historically, US consumers have been willing to spend even in difficult times. Before the 2008-09 slump, personal spending rose in every quarter between 1992 and 2007. That resilience is again in evidence: retail sales in September were at a seven-month high, and sales at chain stores have been strong. Business investment has been even more buoyant: it expanded in the third quarter by an impressive 16.3% at an annual rate, and spending by companies in September on conventional capital goods (that is, excluding defence and aircraft) grew by the most since March. This has been made possible, in part, by strong corporate profits. According to data compiled by Bloomberg, earnings for US companies in the S&P 500 rose by 24% year on year in the third quarter. All of this has occurred despite a debilitating fiscal debate in Washington, a sovereign debt downgrade by a major ratings agency and exceptional volatility in capital markets. This reinforces our view that the US economy, although weak, is not in danger of falling into a recession (absent a shock from the euro zone). US growth will, however, continue to be held back by a weak labour market—the unemployment rate has been at or above 9% for 28 of the last 30 months—and by a moribund housing market.

#### Compromise is impossible – GOP obstructionism intensified after the fiscal cliff

**Sargent 1-2** – Greg, writes The Plum Line blog, a reported opinion blog with a liberal slant (The Morning Plum: GOP can’t put Tea Party genie back in bottle, Washington Post, http://www.washingtonpost.com/blogs/plum-line/wp/2013/01/02/the-morning-plum-gop-cant-put-tea-party-genie-back-in-bottle/)

By any measure, the fiscal deal that finally passed the House yesterday should have been something House Republicans could have enthusiastically supported. After all, as Jonathan Weisman put it, the bill “locks in virtually all of the Bush-era tax cuts, exempts almost all estates from taxation, and enshrines the former president’s credo that dividends and capital gains should be taxed equally and gently.”

Yet in order to get this through the House, we had to go through endless drama, histrionics, threats, and theatrics. And in the end, only 85 of 236 House Republicans voted for it — barely more than a third — meaning it passed largely because of Democratic support.

This perfectly captures what has become of today’s Republican Party. And it doesn’t bode well for the coming debt ceiling battle, or indeed, for key chunks of Obama’s whole second term agenda.

The story is being widely reported today as proof the GOP finally broke from decades of anti-tax orthodoxy. And that’s true, at least in the sense that Senate Republicans overwhelmingly supported the final deal. But the more important point is that a majority of House Republicans didn’t break from it — despite the action of their Senate counterparts — signaling that literally any kind of compromise with them may simply be impossible.

This is the inevitable result of the GOP’s collective decision to organize itself for years around the idea that even the tiniest of tax rate increases on the smallest minority of super rich Americans is nothing short of apostasy. If yesterday’s events were such a horrific defeat for the GOP, as many conservatives are telling us, it’s only because Republican leaders have spent months or years drumming it into GOP base voters’ heads that the most modest of tax increases on the very richest among us would constitute a sellout of deeply sacred principles. Remember when every GOP presidential nominee vowed not to accept even a 10 to one ratio of spending cuts to tax increases? Such stuff is not just bombastic primary rhetoric designed to feed the true believers. For many House Republicans, this idea — and the broader refusal to compromise at any cost — seems to have become a deeply held and guiding governing principle.

What does that tell us about what’s next? Last night Obama reiterated his vow not to negotiate if Republicans hold the debt ceiling hostage. That’s good. But I’m skeptical it will make any difference. Yesterday’s compromise has unleashed total fury among conservatives, and the pressure on Republicans to mount a sustained confrontation over the debt ceiling — and not to back down until they win major entitlement cuts — will be intense. Individual Republicans in safe districts are isolated from the currents of national opinion and have plenty of incentives to continue acting exactly as they are.

#### Debt ceiling won’t pass – lack of courage and election pressures means no one is willing to cave. And anything that does pass won’t be effective

**Merica 1-3** –Dan, writer for CNN (Are the days of Congress 'going big' over?, CNN, http://www.cnn.com/2013/01/03/politics/congress-grand-bargain/)

It was a common refrain during the House and Senate late-night votes to avert the fiscal cliff. Senator after senator, congressman after congressman lamented the fact that the legislation didn't "do more," "go bigger" or that it was "far from perfect."

Political watchers believed the fiscal cliff negotiations were the perfect time for President Barack Obama and House Speaker John Boehner to hatch a "grand bargain" -- a deal that would have included both large increases in tax revenue and major cuts in government spending. At the time, both men looked better positioned to deliver a bipartisan plan. Boehner seemed to have a firmer hand on his caucus leading up to the talks, and the president was coming off a hard-fought re-election win.

Those hopes, however, proved empty.

What passed both the House and Senate was noticeably scaled back and far from grandiose.

This is not the first time a grand bargain has fallen apart. Obama and Boehner worked together in an effort to negotiate a path toward fiscal health in 2011 -- another so-called "grand bargain" -- but the efforts ultimately ended in acrimony. In an interview with CNN's Jessica Yellin, Boehner described it as his "greatest disappointment."

With two grand bargain failures between the president and the speaker, is it really possible for Congress to go big and pass meaningful, bipartisan legislation as the nation approaches hitting its debt ceiling? Members of Congress and political watchers alike say the prospect seems bleak. A combination of lawmakers lacking courage, the threat of primary challenges and nobody wanting to put skin in the game makes it incredibly difficult to get a big, bipartisan deal done.

According to Nathan Gonzales, deputy editor of The Rothenberg Political Report, the biggest deterrent to "going big" is the next election.

"With anything big, members will get a lot of what they like and also a lot that they don't like," Gonzales said. "And in the realm of political campaigns, which focuses on the negative, it is easy to put the negative parts of a bill into a campaign ad and get a lot of attention."

The last few elections have proven this. Outside political groups have, in many situations, funded political hopefuls to challenge congressional incumbents. A whopping $293.5 million in outside money was spent in 2012 congressional races, according to the Federal Election Commission. In the 2010 congressional races, according to the FEC, $153 million was spent by outside groups, and 54 incumbents lost re-election, many of them Democrats.

One difficult vote "doesn't create primary defeat, but it could cause an outside group to get involved, to put the financial backing behind a challenger and all of a sudden make the member's electoral life more miserable," Gonzales said. "This is a fairly new phenomenon. The kind of immediacy with which someone can come out of nowhere, be funded by an outside group and get to a high stage is much quicker than before."

Doubt in getting a grand bargain done is not limited to those on the outside, though. Retiring Republican Rep. Steve LaTourette, R-Ohio, agreed that a grand bargain agreement is not doable.

"No one has the courage to go big because when you go big you are going to make some people mad," LaTourette said shortly before Tuesday night's vote to avert the fiscal cliff. "If I was a Democrat, once you start to go big, the AARP, AFL-CIO is going to come after you, and when you are a Republican, the tax people come after you."

LaTourette has a history with trying to go big. He was the key Republican advocate for the Simpson-Bowles deficit reduction and budget plan, which ultimately failed in the House. He even proposed bringing the plan to the floor at a Republican conference meeting Tuesday afternoon.

Sen. Dick Lugar, R-Indiana, knows this all too well.

Indiana Republican voters kicked Lugar out of office in the party primary in May after 36 years in the Senate. Richard Mourdock, a longtime GOP operative, benefited from manpower and money from tea party activists and outside groups determined to topple the six-term veteran.

Lugar was attacked over questions about whether he even lived in Indiana, for his seniority and for his penchant for bipartisanship. The Club for Growth, a conservative pro-growth group, perhaps played the biggest role, releasing a barrage of ads that framed Lugar as out of step with his own party. The group endorsed Mourdock in mid-February and spent close to $1.5 million on television ads -- close to what Lugar's own campaign spent on TV spots. But it also collected more than $300,000 from donors and gave it to the Mourdock campaign, making their total spending on the race close to $2 million.

Lugar, who voted for Obama's economic stimulus package and the bank and financial institution bailout in 2008, proved that while one tough vote may not hurt you, a few put together can cause headaches.

"The bottom line is a grand bargain or going big would require compromise and the most influential outside groups on both sides are not fans of compromise," Gonzalez said. "Those two factors are at odds with each other."

#### PC Irrelevant – Obama wont use it correctly

Peter Baker (writer for the International Herald Tribune) January 3, 2013 “ Obama deal draws quick complaints from liberals; Compromise reignites debate over president's skills as a negotiator” Lexis

The criticism from the left mirrors past complaints when Mr. Obama included tax cuts in his stimulus package, gave up on a government-run option in health care negotiations and temporarily extended Bush-era tax cuts for the wealthy two years ago. Liberals said Mr. Obama should have capitalized on his re-election victory and the expiration on New Year's Day of all of the Bush tax cuts to force Republicans to accept his terms. ''The president remains clueless about how to use leverage in a negotiation,'' said Adam Green, a co-founder of the Progressive Change Campaign Committee, a liberal advocacy organization. ''Republicans publicly admitted they lost the tax debate and would be forced to cave, yet the president just kept giving stuff away.'' Robert B. Reich, the former labor secretary, said that Mr. Obama had ''stiffened his tactical resolve'' but that ''he's still the same President Obama who wants a deal above all else and seems willing to compromise on even the most basic principle.''

#### FISA Amendment triggers

Bill Chappell (writer for National Public Radio) December 28, 2012 “Congress Extends FISA Wiretapping Act To 2017; Awaits Obama's Signature” http://www.npr.org/blogs/thetwo-way/2012/12/28/168220266/congress-extends-fisa-wiretapping-act-to-2017-awaits-obamas-signature

The FISA Amendments Act has been approved for another five years, as the Senate voted to renew the law that grants the government wide surveillance authority. President Obama has said he intends to sign the measure, which senators approved by a 73-23 margin Friday morning. It had already won approval in the House. The controversial bill, which allows federal agencies to eavesdrop on communications and review email without following an open and public warrant process, has long been a target for privacy and rights groups such as the Electronic Frontier Foundation and the American Civil Liberties Union, which is involved in a Supreme Court case over FISA. The original Foreign Intelligence Surveillance Act dates back to 1978; it was expanded during the Bush administration in 2008, to allow both foreign and domestic surveillance without a warrant, as long as the intent is to gather foreign intelligence. When it was amended in 2008, FISA also provided "retroactive immunity to the telecom companies that assisted the Bush administration in its warrantless wiretapping program," as Open Congress notes in its summary. Before Friday's vote, the 2012 FISA extension faced several attempts to amend it, including one made by Sen. Ron Wyden (D-Ore.), who sought to require the director of national intelligence to share information about telephone and email surveillance — how many Americans have been monitored, for instance, or whether communications between Americans is reviewed. The Wyden amendment was rejected by a 52-43 vote, an indication of the contentiousness surrounding the bill's granting of intelligence-gathering powers. The amendment had bipartisan support that included Democratic Sens. Al Franken and Patty Murray and Republican Sens. Dean Heller and Pat Toomey, among others. But the measure also faced bipartisan opposition. Sens. Dianne Feinstein (D-Calif.) and Saxby Chambliss (R-Ga.), the ranking members of the Senate Intelligence Committee, spoke against the Wyden amendment, with Feinstein saying it would expose "information about a very effective intelligence collection program that is currently classified." She added that the Senate Intelligence and Judiciary Committees already review all of the material.

#### Immigration and gun control triggers the link

The Huffington Post January 2, 2013 “Obama's Immigration Reform Push To Begin This Month” http://www.huffingtonpost.com/2013/01/02/obama-immigration-reform\_n\_2398507.html?view=print&comm\_ref=false

Despite a bruising fiscal cliff battle that managed to set the stage for an even more heated showdown that will likely take place in a matter of months, President Barack Obama is planning to move full steam ahead with the rest of his domestic policy agenda. An Obama administration official said the president plans to push for immigration reform this January. The official, who spoke about legislative plans only on condition of anonymity, said that coming standoffs over deficit reduction are unlikely to drain momentum from other priorities. The White House plans to push forward quickly, not just on immigration reform but gun control laws as well. The timeframe is likely to be cheered by Democrats and immigration reform advocates alike, who have privately expressed fears that Obama's second term will be drowned out in seemingly unending showdowns between parties. The just-completed fiscal cliff deal is giving way to a two-month deadline to resolve delayed sequestration cuts, an expiring continuing resolution to fund the government and a debt ceiling that will soon be hit. With those bitter battles ahead, the possibility of passing other complicated legislation would seem diminished. "The negative effect of this fiscal cliff fiasco is that every time we become engaged in one of these fights, there's no oxygen for anything else," said a Senate Democratic aide, who asked for anonymity to speak candidly. "It's not like you can be multi-tasking -- with something like this, Congress just comes to a complete standstill."

#### Nuclear power has tons of political support.

Koplow, ‘11

[Doug, founder of Earth Track, Inc., has worked on natural resource subsidy issues for more than 20 years, mainly in the energy sector, holds a B.A. in economics from Wesleyan University, M.B.A. from the Harvard Graduate School of Business Administration, Union of Concerned Scientists, February, “Nuclear Power: Still Not Viable Without Subsidies,” http://www.ucsusa.org/assets/documents/nuclear\_power/nuclear\_subsidies\_report.pdf]

The industry and its allies are now pressuring all levels of government for large new subsidies to support the construction and operation of a new generation of reactors and fuel-cycle facilities. The substantial political support the industry has attracted thus far rests largely on an uncritical acceptance of the industry’s economic claims and an incomplete understanding of the subsidies that made—and continue to make—the existing nuclear fleet possible.

#### PC not key

**Klein, 3/19/12** [The Unpersuaded Who listens to a President? by [Ezra Klein](http://www.newyorker.com/magazine/bios/ezra_klein/search?contributorName=ezra%20klein) March 19, 2012, Ezra Klein is the editor of Wonkblog and a columnist at the Washington Post, as well as a contributor to MSNBC and Bloomberghttp://www.newyorker.com/reporting/2012/03/19/120319fa\_fact\_klein#ixzz1p36PrMbH]

This, Edwards says, is the reality facing modern Presidents, and one they would do well to accommodate. “In a rational world, strategies for governing should match the opportunities to be exploited,” he writes. “Barack Obama is only **the latest** in a **long line** of presidents who have not been able to transform the political landscape **through** their efforts at **persuasion**. When he succeeded in achieving major change, it was by mobilizing those ***predisposed* to support** him and driving legislation through Congress on a party-line vote.”

That’s easier said than done. We don’t have a system of government set up for Presidents to drive legislation through Congress. Rather, we have a system that was designed to encourage division between the branches but to resist the formation of political parties. The parties formed anyway, and they now use the branches to compete with one another. Add in minority protections like the filibuster, and you have a system in which the job of the President is to persuade an opposition party that has both the incentive and the power to resist him.

Jim Cooper says, “We’ve effectively lost our Congress and gained a parliament.” He adds, “At least a Prime Minister is empowered to get things done,” but “we have the extreme polarization of a parliament, with party-line voting, without the empowered Prime Minister.” And you can’t solve that with a speech.

#### Winners win

**Halloron, 10** [Liz, National Public Radio, “For Obama what a difference a win will make”, <http://www.npr.org/templates/story/story.php?storyId=125594396>]

Amazing what a win in a **major legislative battle** will do for a president's spirit. (Turmoil over spending and leadership at the Republican National Committee over the past week, and the release Tuesday of a major new and largely sympathetic book about the president by New Yorker editor David Remnick, also haven't hurt White House efforts to drive its own, new narrative.) Obama's Story New Yorkereditor David Remnick has a new book out about Obama. Listen to an interview with Remnick and read a review. ['The Bridge': Remnick On The Ascent Of Obama](http://www.npr.org/templates/story/story.php?storyId=125595945&ps=rs) April 6, 2010 ['Bridge' Tells Obama's Story, Just As We Remember It](http://www.npr.org/templates/story/story.php?storyId=125093691&ps=rs) April 5, 2010 Though the president's national job approval ratings failed to get a boost by the passage of the health care overhaul — his numbers have remained steady this year at just under 50 percent — he has earned grudging respect even from those who don't agree with his policies. "He's achieved something that virtually everyone in Washington thought he couldn't," says Henry Olsen, vice president and director of the business-oriented American Enterprise Institute's National Research Initiative. "And that's given him confidence." The protracted health care battle looks to have taught the White House something about power, says presidential historian Gil Troy — a lesson that will inform Obama's pursuit of his initiatives going forward. "I think that Obama realizes that **presidential power is a muscle**, and the more you exercise it, the stronger it gets," Troy says. "He exercised that power and had a success with health care passage, and now he wants to make sure people realize it's not just a blip on the map." The White House now has an opportunity, he says, to change the narrative that had been looming — that the Democrats would lose big in the fall midterm elections, and that Obama was looking more like one-term President Jimmy Carter than two-termer Ronald Reagan, who also managed a difficult first-term legislative win and survived his party's bad showing in the midterms. Approval Ratings Obama is exuding confidence since the health care bill passed, but his approval ratings as of April 1 remain unchanged from the beginning of the year, according to [Pollster.com](http://www.pollster.com/polls/us/jobapproval-obama.php). What's more, just as many people disapprove of Obama's health care policy now as did so at the beginning of the year. According to the most recent numbers: Forty-eight percent of all Americans approve of Obama, and 47 disapprove. Fifty-two percent disapprove of Obama's health care policy, compared with 43 percent who approve. **Stepping Back From A Precipice** Those watching the re-emergent president in recent days say it's difficult to imagine that it was only weeks ago that Obama's domestic agenda had been given last rites, and pundits were preparing their pieces on a failed presidency. Obama himself had framed the health care debate as a referendum on his presidency. A loss would have "ruined the rest of his presidential term," says Darrell West, director of governance studies at the liberal-leaning Brookings Institution. "It would have made it difficult to address other issues and emboldened his critics to claim he was a failed president." The conventional wisdom in Washington after the Democrats lost their supermajority in the U.S. Senate when Republican Scott Brown won the Massachusetts seat long held by the late Sen. Edward Kennedy was that Obama would scale back his health care ambitions to get something passed. "I thought he was going to do what most presidents would have done — take two-thirds of a loaf and declare victory," says the AEI's Olsen. "But he doubled down and made it a vote of confidence on his presidency, parliamentary-style." "You've got to be impressed with an achievement like that," Olsen says. But Olsen is among those who argue that, long-term, Obama and his party would have been better served politically by an incremental approach to reworking the nation's health care system, something that may have been more palatable to independent voters Democrats will need in the fall. "He would have been able to show he was listening more, that he heard their concerns about the size and scope of this," Olsen says. **Muscling out a win** on a sweeping health care package may have invigorated the president and **provided evidence of leadership**, but, his critics say, it remains to be seen whether Obama and his party can reverse what the polls now suggest is a losing issue for them. **Golden Boy Tested** One of the questions that has trailed Obama is how he would deal with criticism and the prospect of failure, says Troy, a McGill University history professor and visiting scholar affiliated with the bipartisan Policy Center in Washington. "He is one of those golden boys who never failed in his life, and people like that are often not used to criticism and failure," Troy says. Obama and his campaign were temporarily knocked for a loop early in the 2008 presidential campaign by then-GOP vice presidential candidate Sarah Palin's "zingers," Troy says, "and Obama was thrown off balance again by the loss of the Massachusetts Senate seat." The arc of the health care debate reminded observers that Obama is not just a product of Harvard, but also of tough Chicago politics, Troy says. "You don't travel as far and as fast as Barack Obama without having a spine of steel," he says. "He has an ability to regenerate, to come back, and knows that there is no such thing as a dirty win: a win is a win" — even if it infuriates the progressive wing of the president's party, which wanted far more sweeping changes to the nation's health care system. **GOP Stumbles** Obama's new mojo has been abetted, in a way, by high-profile troubles at the Republican National Committee. RNC Chairman Michael Steele has been under fire over the past week for his spending on private jets and limousines, and a staffer resigned after submitting to the committee a nearly $2,000 tab for a visit by young party members to a risque Los Angeles nightclub. The disarray intensified Monday with the resignation of the committee's chief of staff, and growing anger among top GOP strategists and fundraisers. "Steele has kept Republicans off-message," says West, of Brookings. "Every story about RNC spending is one less story about their views on health care at a time when news coverage has shifted in a more favorable direction." The distraction continued Monday when detractors accused Steele of playing the race card after he told ABC News that as an African American, he, like Obama, is being held to a higher standard. White House Spokesman Robert Gibbs, when asked about Steele's assertion, said the RNC chairman's problem "isn't the race card, it's the credit card." The controversy, Olsen says, hasn't been good for the Republicans' preparations for elections in terms of money and organization. But he doesn't view it as "a voter issue." **How Win Translates** When Reagan won his tough legislative battle in the early 1980s, it was over tax cuts, something voters saw as directly related to the then-dismal economy. Obama has long made a case for health care reform as a big piece of economic reform, but it's a difficult argument to make to voters, Olsen says, particularly when many of the health care law's major provisions don't go into effect for another four years. But observers like Troy say they believe that though initially unrelated, a boost in employment among Americans would encourage voters to look more favorably on the health care overhauls. "The perceived success of health care legislation rides on job creation," Troy says. Economists have recently declared the nation's recession, which began in 2007, over. But the unemployment rate has remained stubbornly at just under 10 percent. "I think he understands he's in a crucial period of his presidency," Olsen says. "He's taken a lot of risks, and there's not immediate rewards." Obama faces continuing tests on other big domestic issues, including Wall Street reform, the economy and climate change, as well as myriad foreign policy challenges ranging from testy relations with Israel and uncertainties about Iran's nuclear capabilities, to wars in Iraq and Afghanistan. Late last month, the administration and Russia agreed to a new nuclear arms treaty that is expected to be signed Thursday in advance of an international summit in Washington. The world is waiting, Troy says, to see how the president's renewed confidence plays out on the international stage. But the newly invigorated president continues to encourage voters to wait and see what his efforts produce.

#### The treasury will executive fiat budgeting – solves debt ceiling independent of congress

J.D. Foster (PhD, is Norman B. Ture Senior Fellow in the Economics of Fiscal Policy in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation) January 3, 2013 “A New, Extra-Extraordinary Debt-Ceiling Tool” http://www.heritage.org/research/reports/2013/01/debt-ceiling-and-extraordinary-measures-to-fund-budget-shortfall

Geithner&rsquo;s missive lists and describes Treasury&rsquo;s &ldquo;extraordinary measures&rdquo; used in similar past episodes to preserve the current level of deficit spending after reaching the debt ceiling. These measures, essentially cash and debt management techniques, normally provide Treasury with about a $200 billion cushion. With trillion-dollar budget deficits, this cushion might be expected to last about two months before available resources would be insufficient to cover all government obligations. Geithner&rsquo;s list of extraordinary measures is missing one item that has never before been employed: prioritizing federal spending. It is the item behind the sign &ldquo;Break Glass Only in Case of Emergency.&rdquo; According to Administration projections, the government is expected to take in an average of $230 billion per month in 2013 while spending an average of $300 billion. Suppose the government were to reach the debt limit and exhaust the tools that Treasury acknowledges. The last emergency financial management tool Geithner could use would be to prioritize federal spending so as to allocate incoming receipts to the government&rsquo;s highest priorities&mdash;what might be called real-time executive fiat budgeting or, perhaps more accurately, a forced balanced budget. Interest on outstanding debt, amounting to roughly $19 billion per month, would have first claim on incoming receipts. As the Administration would surely make these interest payments a top priority regardless of its budgeting strategy, warnings about &ldquo;default&rdquo; on the nation&rsquo;s debt obligations do not hold water. Next in order of immediate priority would be national security, followed by Social Security, Medicare, and Medicaid payments. Funding these in full with available resources would leave roughly $22 billion per month to apply to the other $92 billion a month in legislated spending across domestic discretionary and all other mandatory spending programs. In this eventuality, one way or another, $70 billion of obligated spending per month would go unspent.

#### Trillion dollar platinum coin solves if Republicans push too hard (lol)

Huffington Post January 3, 2013 “Can We Avert The Coming Debt Ceiling Crisis With A Magic Coin?” http://www.huffingtonpost.com/2013/01/03/debt-ceiling-coin\_n\_2404653.html

Because of the deal made on New Year's Day that averted the immediate impact of the so-called fiscal cliff, America will face a sequel to the debt ceiling hostage crisis that led to the super committee and the sequester and the fiscal cliff and the fiscal cliff solution and the sequel to the debt ceiling hostage crisis that led to the super committee and the sequester and the fiscal cliff and the fiscal cliff solution, et cetera, ad infinitum. The best of all possible fiscal cliff deals would have included a guaranteed de-weaponization of the debt ceiling. Since the fiscal cliff deal did not include any such de-weaponization, America's credit and the global economy are still very much jeopardized by the dangerous lunatics who have threatened another round of hostage-taking. What can be done about it? Well, what about a magic trillion-dollar coin, wrought from platinum? Would that help? Actually, in an interview with Capital New York's Reid Pilifant, Rep. Jerrold Nadler (D-N.Y.) suggests that it is possible to mint just such a coin, stick it in the Treasury, and stick a fork in the coming debt ceiling crisis before it begins. "I'm being absolutely serious," Nadler told Pilifant, adding, "It sounds silly but it's absolutely legal. And it would normally not be proper to consider such a thing, except when you're faced with blackmail to destroy the country's economy, you have to consider things."

#### Congressional dysfunction prevents any deal from solving the economy – fighting breeds uncertainty

**Wiseman and Rugaber 1-2** – Paul and Christopher, AP Economic Writers (US still faces political fights on spending, debt, The Seattle Times, http://seattletimes.com/html/businesstechnology/2020038169\_apusfiscalcliffeconomy.html)

A last-minute deal will keep the U.S. from driving off the so-called "fiscal cliff," but higher taxes and continued political fighting in Washington threaten to shake the fragile economy well into 2013.

A bill passed by Congress late Tuesday averts widespread tax increases and delays deep spending cuts that had threatened to return the country to recession.

Investors around the world breathed a collective sigh of relief after the biggest near-term stumbling block for the world economy had been cleared.

At midday Wednesday on Wall Street, the Dow Jones industrial average was up a hefty 223 points, or 1.7 percent. Broader stock averages also jumped.

In Europe, the FTSE 100 index of leading British shares closed up 2.2 percent to 6,027.37, its first time above 6,000 since July 2011. The CAC-40 in France rose 2.6 percent, and Germany's DAX ended 2.2 percent higher.

Earlier, in Asia, Hong Kong's Hang Seng index shot up 2.9 percent to close at 23,311.89, its highest finish since June 1, 2011. Australia's S&P/ASX 200 surged 1.2 percent to close at 4,705.90, its best finish in 19 months.

Some economists were disappointed that Congress and the White House couldn't reach agreement on a broader deal to significantly reduce the deficit over the next 10 years. That could have boosted business and consumer confidence and accelerated growth.

"Nothing really has been fixed," said Joseph LaVorgna, an economist at Deutsche Bank. "There are much bigger philosophical issues that we aren't even addressing yet."

Lawmakers postponed tough decisions on government spending, giving themselves a reprieve from cuts that were scheduled to start taking effect automatically Jan. 1. That just sets the stage for more hard bargaining later. Spending cuts could hurt growth even more.

Another standoff is likely to arrive as early as February, when Congress will need to raise the $16.4 trillion federal borrowing limit so the government can keep paying its bills. House Republicans, who objected strongly to the latest fiscal deal Tuesday before the chamber finally voted to approve it, probably won't agree to raise the debt limit without offsetting spending cuts that Democrats are sure to resist.

President Barack Obama warned Republicans late Tuesday that "if Congress refuses to give the United States government the ability to pay these bills on time, the consequences for the entire global economy would be catastrophic, far worse than the impact of a fiscal cliff."

Meanwhile, the economy doesn't have much growth to give. Mark Vitner, senior economist at Wells Fargo, predicts it will expand just 1.5 percent in 2013, down from a weak 2.2 percent in 2012. Unemployment stands at 7.7 percent.

Ben Schwartz, chief market strategist for Lightspeed Financial, said unemployment was still likely to edge up and retail sales growth was likely to be weaker than last year.

"Regardless of a deal getting done, people on Wall Street are not going to run around giving high fives" in celebration, Schwartz said. "The federal government is obviously dysfunctional, to say the least."

The months-long political standoff over fiscal policy has already taken its toll, adding uncertainty that has discouraged consumers from spending and businesses from hiring and investing.

The fiscal cliff, with its Jan. 1 deadline to reach a deal over taxes and spending, was created to force Democrats and Republicans to compromise, and it barely succeeded. Without a deal, more than $500 billion in tax increases would hit the economy in 2013 alone, along with $109 billion in cuts from the military and domestic spending programs.

Negotiations to avert catastrophe have highlighted once again how far apart the two parties are on taxes (Republicans don't want to raise them) and spending (Democrats are reluctant to cut government programs).

"What induces the two sides to stop fighting and start compromising?" asked Ethan Harris, co-head of global economics at Bank of America Merrill Lynch.

Political gridlock has been rattling financial markets and shaking consumer and business confidence the past two years.

After a fight over raising the debt limit last year, the credit rating agency Standard & Poor's yanked the U.S. government's blue-chip AAA bond rating because it feared that America's dysfunctional political system couldn't deliver a credible plan to reduce the federal government's debt. S&P warned that "the differences between political parties have proven to be extraordinarily difficult to bridge."

The Dow dropped 635 points in panicked selling the first day of trading after the S&P announcement.

Outside Washington, the economy has been getting some good news. Europe's financial crisis appears to have eased. And the U.S. real estate market finally appears to be recovering from the housing bust.

But partisan divide has left businesses and consumers wondering what's going to happen to their taxes and to federal contracts.

Companies have plenty of cash. But they reduced spending on industrial equipment, computers and software from July to September, the first quarterly drop since mid-2009 when the economy was still in recession. And hiring has been stuck at a modest level of about 150,000 new jobs per month this year.

Consumer confidence fell in December for the second straight month, according to a survey by the Conference Board, which blamed the drop on worries about the fiscal cliff. The uncertainty is also believed to have hurt holiday shopping, which grew at the slowest pace this year since 2008.

#### Dysfunction means any deal fails to solve the economy – lowest common denominator

* Rajadhyaksha - head of rates and securitised products research at Barclays

**Foley 1-2** – Stephen, writer for FT (Debt ceiling risk looms as cliff averted, Financial Time – Markets, http://www.ft.com/intl/cms/s/0/31c0e69e-54eb-11e2-a628-00144feab49a.html#axzz2GpzWMQGs)

Even without the debt ceiling wild card, the prospect of a long budget fight could still have negative consequences for the market, because it could still have consequences for the US economy.

Paul Ashworth, chief US economist at Capital Economics, says Congress’s failure to make a “grand bargain” that would resolve its long-term budget issues, opting instead only for a smaller tax deal, has prolonged the uncertainty holding back consumer and business spending.

“We had hoped that a comprehensive agreement would prompt a wave of spending by households and businesses who are currently sitting on the sidelines due to uncertainty about fiscal policy,” he told clients. “Any upside risk to our forecast from pent-up demand may now have gone, for a few more quarters at least.”

There could be particular volatility in defence sector stocks, since the fiscal cliff deal delayed rather than renegotiated the additional $55bn in annual cuts to the Pentagon budget that are part of the so-called “sequester”. The aerospace and defence sector was underperforming the wider S&P 500 at Wednesday lunchtime.

Jim Paulsen, chief investment strategist at Wells Capital Management, was among the optimists, saying even a brief respite from political drama will be positive for markets.

“It ends, for now, the cliff and allows focus among investors to return to fundamentals, which are not too bad. The US is growing faster than most thought, China is re-emerging and eurozone calamity fears have calmed,” he says.

The grand bargain that the White House and Republican Speaker John Boehner have twice now failed to reach is aimed at cutting the US budget deficit by $4tn over 10 years, and to bring the deficit to GDP ratio closer to a sustainable 3 per cent.

An open question today is how much longer the rating agencies will give them to come to an accord. Barclays, Capital Economics, National Alliance Securities and others are forecasting more downgrades this year, on top of Standard & Poor’s move to strip the US of its AAA rating in August 2011.

“The Congress only seems to be able to agree the lowest common denominator,” says Mr Rajadhyaksha. “That sends a very poor signal to the rating agencies.”

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### AT: Prolif

#### Transition to IFRs create a global proliferation resistant fuel cycle

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "Q%26A on Integral Fast Reactors – safe, abundant, non-polluting power," 9/18/10) [http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http://bravenewclimate.com/2010/09/18/ifr-fad-7/](http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http%3A//bravenewclimate.com/2010/09/18/ifr-fad-7/)

Thermal reactors with reprocessing would do at least a little better.¶ Recycling (it would be with the PUREX process, or an equivalent) could stretch the U-235 supply another few decades—but remember the consequences: growing stockpiles of plutonium, pure plutonium streams in the PUREX plants, and the creation of 100,000-year plutonium mines.¶ If you’re going to talk about “PUREX” and “plutonium mines” you should say what they are. First, what’s PUREX?¶ It’s a chemical process developed for the nuclear weapons program, to separate plutonium from everything else that comes out of a reactor. Weapons require very pure plutonium, and that’s what PUREX delivers. The pyroprocess used in the IFR is very different. It not only does not, it cannot, produce plutonium with the chemical purity needed for weapons.¶ Why do you keep referring to “chemical” purity?¶ Because chemical and isotopic quality are two different things. Plutonium for a weapon has to be pure chemically. Weapons designers also want good isotopic quality—that is, they want at least 93% of their plutonium to consist of the isotope Pu- 239. A chemical process does not separate isotopes.¶ I see. Now, what about the “plutonium mines?”¶ When spent fuel or vitrified reprocessing waste from thermal reactors is buried, the result is a concentrated geological deposit of plutonium. As its radioactivity decays, those deposits are sources of raw material for weapons, becoming increasingly attractive over the next 100,000 years and more (the half-life of Pu-239 being 24,000 years).¶ You listed, back at the beginning, some problems that the IFR would ameliorate. A lot of those problems are obviously related to proliferation of nuclear weapons.¶ Definitely. For instance, although thermal reactors consume more fuel than they produce, and thus are not called “breeders,” they inescapably are prolific breeders of plutonium, as I said. And that poses serious concerns about nuclear proliferation. And proliferation concerns are even greater when fuel from thermal reactors is recycled, since the PUREX method is used. IFRs have neither of those drawbacks.¶ Why does it seem that there is more proliferation-related concern about plutonium than about uranium? Can’t you make bombs from either?¶ Yes. The best isotopes for nuclear explosives are U-235, Pu- 239, and U-233. Only the first two of those, however, have been widely used. All the other actinide isotopes, if present in appreciable quantity, in one way or another complicate the design and construction of bombs and degrade their performance. Adequate isotopic purity is therefore important, and isotopic separation is much more difficult than chemical separation. Even so, with plutonium of almost any isotopic composition it is technically possible to make an explosive (although designers of military weapons demand plutonium that is at least 93% Pu-239), whereas if U-235 is sufficiently diluted with U-238 (which is easy to do and hard to undo), the mixture cannot be used for a bomb.¶ High-quality plutonium is the material of choice for a large and sophisticated nuclear arsenal, while highly enriched uranium would be one of the easier routes to a few crude nuclear explosives.¶ So why the emphasis on plutonium?¶ You’re asking me to read people’s minds, and I’m not good at that. Both uranium and plutonium are of proliferation concern.¶ Where is the best place for plutonium?¶ Where better than in a reactor plant—particularly an IFR facility, where there is never pure plutonium (except some, briefly, when it comes in from dismantled weapons), where the radioactivity levels are lethal, and where the operations are done remotely under an inert, smothering atmosphere? Once enough IFRs are deployed, there never will need to be plutonium outside a reactor plant—except for the then diminishing supply of plutonium left over from decades of thermal-reactor operation.¶ How does the IFR square with U.S. policy of discouraging plutonium production, reprocessing and use?¶ It is entirely consistent with the intent of that policy—to render plutonium as inaccessible for weapons use as possible. The wording of the policy, however, is now obsolete.¶ How so?¶ It was formulated before the IFR’s pyroprocessing and electrorefining technology was known—when “reprocessing” was synonymous with PUREX, which creates plutonium of the chemical purity needed for weapons. Since now there is a fuel cycle that promises to provide far-superior management of plutonium, the policy has been overtaken by events.¶ Why is the IFR better than PUREX? Doesn’t “recycling” mean separation of plutonium, regardless of the method?¶ No, not in the IFR—and that misunderstanding accounts for some of the opposition. The IFR’s pyroprocessing and electrorefining method is not capable of making plutonium that is pure enough for weapons. If a proliferator were to start with IFR material, he or she would have to employ an extra chemical separation step.¶ But there is plutonium in IFRs, along with other fissionable isotopes. Seems to me that a proliferator could take some of that and make a bomb.¶ Some people do say that, but they’re wrong, according to expert bomb designers at Livermore National Laboratory. They looked at the problem in detail, and concluded that plutonium-bearing material taken from anywhere in the IFR cycle was so ornery, because of inherent heat, radioactivity and spontaneous neutrons, that making a bomb with it without chemical separation of the plutonium would be essentially impossible—far, far harder than using today’s reactor-grade plutonium.¶ So? Why wouldn’t they use chemical separation?¶ First of all, they would need a PUREX-type plant—something that does not exist in the IFR cycle.¶ Second, the input material is so fiendishly radioactive that the processing facility would have to be more elaborate than any PUREX plant now in existence. The operations would have to be done entirely by remote control, behind heavy shielding, or the operators would die before getting the job done. The installation would cost millions, and would be very hard to conceal.¶ Third, a routine safeguards regime would readily spot any such modification to an IFR plant, or diversion of highly radioactive material beyond the plant.¶ Fourth, of all the ways there are to get plutonium—of any isotopic quality—this is probably the all-time, hands-down hardest.¶ The Long Term¶ Does the plutonium now existing and being produced by thermal reactors raise any proliferation concerns for the long term?¶ It certainly does. As I said earlier, burying the spent fuel from today’s thermal reactors creates geological deposits of plutonium whose desirability for weapons use is continually improving. Some 30 countries now have thermal-reactor programs, and the number will grow. To conceive of that many custodial programs being maintained effectively for that long is a challenge to the imagination. Since the IFR can consume plutonium, it can completely eliminate this long-term concern.¶ Are there other waste-disposal problems that could be lessened?¶ Yes. Some constituents of the waste from thermal reactors remain appreciably radioactive for thousands of years, leading to 10,000-year stability criteria for disposal sites. Waste disposal would be simpler if that time frame could be shortened. With IFR waste, the time of concern is less than 500 years.¶ What about a 1994 report by the National Academy of Sciences? The Washington Post said that the NAS report “denounces the idea of building new reactors to consume plutonium.”¶ That characterization of the report is a little strong, but it is true that the members of the NAS committee seem not to have been familiar with the plutonium-management potential of the IFR. They did, however, recognize the “plutonium mine” problem. They say (Executive Summary, p.3):¶ Because plutonium in spent fuel or glass logs incorporating high-level wastes still entails a risk of weapons use, and because the barrier to such use diminishes with time as the radioactivity decays, consideration of further steps to reduce the long-term proliferation risks of such materials is required, regardless of what option is chosen for [near-term] disposition of weapons plutonium. This global effort should include continued consideration of more proliferation-resistant nuclear fuel cycles, including concepts that might offer a long-term option for nearly complete elimination of the world’s plutonium stocks. The IFR, obviously, is just such a fuel cycle—a prime candidate for “continued consideration.”

#### We’re on the brink of rapid prolif – access to tech is inevitable and multilateral institutions fail

**CFR 12** [CFR 7-5-2012, "The Global Nuclear Nonproliferation Regime," Council on Foreign Relations]

Nuclear weapons proliferation, whether by state or nonstate actors, poses one of the greatest threats to international security today. Iran's apparent efforts to acquire nuclear weapons, what amounts to North Korean nuclear blackmail, and the revelation of the A.Q. Khan black market nuclear network all underscore the far-from-remote possibility that a terrorist group or a so-called rogue state will acquire weapons of mass destruction or materials for a dirty bomb.¶ The problem of nuclear proliferation is global, and any effective response must also be multilateral. Nine states (China, France, India, Israel, North Korea, Pakistan, Russia, the United Kingdom, and the United States) are known or believed to have nuclear weapons, and more than thirty others (including Japan, Germany, and South Korea) have the technological ability to quickly acquire them. Amid volatile energy costs, the accompanying push to expand nuclear energy, growing concerns about the environmental impact of fossil fuels, and the continued diffusion of scientific and technical knowledge, access to dual-use technologies seems destined to grow.¶ In the background, a nascent global consensus regarding the need for substantial nuclear arms reductions, if not complete nuclear disarmament, has increasingly taken shape. In April 2009, for instance, U.S. president Barack Obama reignited global nonproliferation efforts through a landmark speech in Prague. Subsequently, in September of the same year, the UN Security Council (UNSC) unanimously passed Resolution 1887, which called for accelerated efforts toward total nuclear disarmament. In February 2012, the number of states who have ratified the Comprehensive Test Ban Treaty increased to 157, heightening appeals to countries such as the United States, Israel, and Iran to follow suit.¶ Overall, the existing global nonproliferation regime is a highly developed example of international law. Yet, despite some notable successes, existing multilateral institutions have failed to prevent states such as India, Pakistan, and North Korea from "going nuclear," and seem equally ill-equipped to check Iran as well as potential threats from nonstate, terrorist groups. The current framework must be updated and reinforced if it is to effectively address today's proliferation threats, let alone pave the way for "the peace and security of a world without nuclear weapons."

### Econ

#### No resources

**Bennett and Nordstrom 2000** – Department of Political Science at Penn State (Scott and Timothy, Journal of Conflict Resolution, “Foreign Policy Substitutability and Internal Economic Problems in Enduring Rivalries,” February 2000, EBSCO)

Alternative relationships between domestic economic performance and international conflict also have been proposed, perhaps most importantly by Blainey (1973, 74). Blainey offers the alternative hypothesis about economics and war that economically challenged countries are more likely to be the target of aggressive military acts than their initiator (1973, 86). Faced with a poor target in a bad economic situation, who is faced with an unhappy populace and possibly limited resources, potential conflict initiators are likely to see opportunity. The argument also parallels the historical notion that leaders would only go to war when their coffers were full—in bad times, leaders may simply not be able to afford to go to conflict. Blainey’s argument appears to pose a challenge to diversionary conflict theory in its emphasis on what is the most likely direction of conflict. Note, however, that its prediction (weak states become targets) differs from a strategic application of diversionary conflict theory.

### Politics UQ

#### Debt ceiling won’t pass – lack of courage and election pressures means no one is willing to cave. And anything that does pass won’t be effective

**Merica 1-3** –Dan, writer for CNN (Are the days of Congress 'going big' over?, CNN, http://www.cnn.com/2013/01/03/politics/congress-grand-bargain/)

It was a common refrain during the House and Senate late-night votes to avert the fiscal cliff. Senator after senator, congressman after congressman lamented the fact that the legislation didn't "do more," "go bigger" or that it was "far from perfect."

Political watchers believed the fiscal cliff negotiations were the perfect time for President Barack Obama and House Speaker John Boehner to hatch a "grand bargain" -- a deal that would have included both large increases in tax revenue and major cuts in government spending. At the time, both men looked better positioned to deliver a bipartisan plan. Boehner seemed to have a firmer hand on his caucus leading up to the talks, and the president was coming off a hard-fought re-election win.

Those hopes, however, proved empty.

What passed both the House and Senate was noticeably scaled back and far from grandiose.

This is not the first time a grand bargain has fallen apart. Obama and Boehner worked together in an effort to negotiate a path toward fiscal health in 2011 -- another so-called "grand bargain" -- but the efforts ultimately ended in acrimony. In an interview with CNN's Jessica Yellin, Boehner described it as his "greatest disappointment."

With two grand bargain failures between the president and the speaker, is it really possible for Congress to go big and pass meaningful, bipartisan legislation as the nation approaches hitting its debt ceiling? Members of Congress and political watchers alike say the prospect seems bleak. A combination of lawmakers lacking courage, the threat of primary challenges and nobody wanting to put skin in the game makes it incredibly difficult to get a big, bipartisan deal done.

According to Nathan Gonzales, deputy editor of The Rothenberg Political Report, the biggest deterrent to "going big" is the next election.

"With anything big, members will get a lot of what they like and also a lot that they don't like," Gonzales said. "And in the realm of political campaigns, which focuses on the negative, it is easy to put the negative parts of a bill into a campaign ad and get a lot of attention."

The last few elections have proven this. Outside political groups have, in many situations, funded political hopefuls to challenge congressional incumbents. A whopping $293.5 million in outside money was spent in 2012 congressional races, according to the Federal Election Commission. In the 2010 congressional races, according to the FEC, $153 million was spent by outside groups, and 54 incumbents lost re-election, many of them Democrats.

One difficult vote "doesn't create primary defeat, but it could cause an outside group to get involved, to put the financial backing behind a challenger and all of a sudden make the member's electoral life more miserable," Gonzales said. "This is a fairly new phenomenon. The kind of immediacy with which someone can come out of nowhere, be funded by an outside group and get to a high stage is much quicker than before."

Doubt in getting a grand bargain done is not limited to those on the outside, though. Retiring Republican Rep. Steve LaTourette, R-Ohio, agreed that a grand bargain agreement is not doable.

"No one has the courage to go big because when you go big you are going to make some people mad," LaTourette said shortly before Tuesday night's vote to avert the fiscal cliff. "If I was a Democrat, once you start to go big, the AARP, AFL-CIO is going to come after you, and when you are a Republican, the tax people come after you."

LaTourette has a history with trying to go big. He was the key Republican advocate for the Simpson-Bowles deficit reduction and budget plan, which ultimately failed in the House. He even proposed bringing the plan to the floor at a Republican conference meeting Tuesday afternoon.

Sen. Dick Lugar, R-Indiana, knows this all too well.

Indiana Republican voters kicked Lugar out of office in the party primary in May after 36 years in the Senate. Richard Mourdock, a longtime GOP operative, benefited from manpower and money from tea party activists and outside groups determined to topple the six-term veteran.

Lugar was attacked over questions about whether he even lived in Indiana, for his seniority and for his penchant for bipartisanship. The Club for Growth, a conservative pro-growth group, perhaps played the biggest role, releasing a barrage of ads that framed Lugar as out of step with his own party. The group endorsed Mourdock in mid-February and spent close to $1.5 million on television ads -- close to what Lugar's own campaign spent on TV spots. But it also collected more than $300,000 from donors and gave it to the Mourdock campaign, making their total spending on the race close to $2 million.

Lugar, who voted for Obama's economic stimulus package and the bank and financial institution bailout in 2008, proved that while one tough vote may not hurt you, a few put together can cause headaches.

"The bottom line is a grand bargain or going big would require compromise and the most influential outside groups on both sides are not fans of compromise," Gonzalez said. "Those two factors are at odds with each other."

#### No bipartisanship – relations among top officials have deteriorated and republicans will maintain a hardline stance

**Reuters 1-2** (Bigger fights loom after "fiscal cliff" deal, http://www.reuters.com/article/2013/01/02/us-usa-fiscal-idUSBRE8A80WV20130102)

Republicans believe they will have greater leverage over Democrat Obama when they must consider raising the borrowing limit, likely in February.

The stakes are perhaps even higher in the debt issue than in the fiscal cliff because failure to close a deal could mean a default on U.S. debt or another downgrade in the U.S. credit rating. A similar showdown in 2011 ultimately led to a credit downgrade.

In fact, bond rating agency Moody's Investors Service warned Washington on Wednesday it must do more to cut the deficit than it did in the "fiscal cliff" measure if the country is to turn around its negative sovereign debt rating.

Republican Senator Pat Toomey of Pennsylvania said his party had to be ready to do whatever it takes to get spending cuts.

"Our opportunity here is on the debt ceiling," Toomey said on MSNBC. "We Republicans need to be willing to tolerate a temporary, partial government shutdown, which is what that could mean."

Yet Obama may be emboldened by winning the first round of fiscal fights when dozens of House Republicans buckled and voted for major tax hikes for the first time in two decades.

Deteriorating relations between leaders in the two parties during the fiscal cliff episode do not bode well for the more difficult fights ahead.

Vice President Joe Biden and Republican Senate leader Mitch McConnell had to step in to work out the final deal amid frayed relations between House Speaker John Boehner and Obama.

Senate Democratic leader Harry Reid also drew the ire of Boehner, who told Reid in the White House to "Go fuck yourself" after a tense meeting last week, aides said. His retort came after the Democrat accused Boehner of running "dictatorship" in the House.

# Doubles – Aff v Georgia LS

## 1ac

### 1AC Plan – with S-PRISM

#### The United States federal government should substantially increase loan guarantees for integral fast reactors using the S-PRISM design.

### Nuclear Leadership

#### Nuclear power is inevitable globally – Inaction on IFRs is killing US nuclear leadership

**Shuster 11** [Joseph Shuster, founder of Minnesota Valley Engineering and Chemical Engineer, 9-8-2011, "Response to Draft Report From Obama’s Blue Ribbon Commission (BRC) on America’s Nuclear Future dated July 29, 2011," Beyond Fossil Fools]

Contrary to the commission’s declarations on the matter, the U.S. is in danger of losing its once ¶ strong nuclear leadership. As a result we would have less to say about how nuclear materials are ¶ to be managed in the world and that could expose the U.S. to some inconvenient if not downright ¶ dangerous consequences. China is now building a large pilot plant said to be identical to our ¶ successful EBR-II plant that proved the design of the IFR. Meanwhile in the U.S. after complete ¶ success, EBR II was shut down, not for technical reasons but for political reasons during the ¶ Clinton administration, a decision destined to be one of the worst in our nation’s history.¶ Much of the world is already committed to a nuclear future with some countries eagerly waiting ¶ to license the American version of Generation IV Fast Reactors—the IFR. We still have the best ¶ IFR technology in the world but have squandered much of our lead, partly by allowing a largely ¶ unqualified commission two years of useless deliberation. What we really did was give our ¶ competitors an additional two years to catch up.

#### IFR restores leadership on nuclear issues – key to contain proliferation

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "IFR FaD context – the need for U.S. implementation of the IFR," 2/18/10) http://bravenewclimate.com/2010/02/18/ifr-fad-context/-http://bravenewclimate.com/2010/02/18/ifr-fad-context/

ON THE NEED FOR U.S. IMPLEMENTATION OF THE INTEGRAL FAST REACTOR¶ The IFR ties into a very big picture — international stability, prevention of war, and avoiding “proliferation” (spread) of nuclear weapons.¶ – The need for energy is the basis of many wars, including the ones we are engaged in right now (Iraq and Afghanistan). If every nation had enough energy to give its people a decent standard of living, that reason for conflict would disappear.¶ – The only sustainable energy source that can provide the bulk of the energy needed is nuclear power.¶ – The current need is for more thermal reactors — the kind we now use.¶ – But for the longer term, to provide the growing amount of energy that will be needed to maintain civilization, the only proven way available today is with fast-reactor technology.¶ – The most promising fast-reactor type is the IFR – metal-fueled, sodium-cooled, with pyroprocessing to recycle its fuel.¶ – Nobody knows yet how much IFR plants would cost to build and operate. Without the commercial-scale demo of the IFR, along with rationalization of the licensing process, any claims about costs are simply hand-waving guesses.¶ \* \* \* \*¶ Background info on proliferation (of nuclear weapons). Please follow the reasoning carefully.¶ – Atomic bombs can be made with highly enriched uranium (90% U-235) or with good-quality plutonium (bomb designers want plutonium that is ~93% Pu-239).¶ – For fuel for an LWR, the uranium only has to be enriched to 3 or 4% U-235.¶ – To make a uranium bomb you don’t need a reactor — but you do need access to an enrichment facility or some other source of highly enriched uranium…¶ – Any kind of nuclear reactor can be used to make weapons-quality plutonium from uranium-238, but the uranium has to have been irradiated for only a very short period. In other words, nobody would try to make a plutonium weapon from ordinary spent fuel, because there are easier ways to get plutonium of much better quality.¶ – Plutonium for a weapon not only has to have good isotopic quality, it also has to be chemically uncontaminated. Thus the lightly irradiated fuel has to be processed to extract the plutonium in a chemically pure form. But mere possession of a reactor is not sufficient for a weapons capability — a facility using a chemical process called PUREX is also needed.¶ – Regardless of how many reactors a country has, it cannot have a weapons capability unless it has either the ability to enrich uranium or to do PUREX-type fuel reprocessing.¶ – Therefore, the spread of weapons capability will be strongly inhibited if the only enrichment and reprocessing facilities are in countries that already have a nuclear arsenal.¶ – But that can only happen if countries with reactors (and soon that will be most of the nations of the world) have absolutely ironclad guarantees that they can get the fuel they need even if they can’t make their own, regardless of how obnoxious their political actions might be.¶ – Such guarantees will have to be backed up by some sort of international arrangement, and that can only come to pass if there is effective leadership for the laborious international negotiations that will have to take place. (For a relevant discussion, see here)¶ – At present, the only nation that has a realistic potential to be such a leader is the United States.¶ – But a country cannot be such a leader in the political arena unless it is also in the technological forefront.¶ – The United States used to be the reactor-technology leader, but it abandoned that role in 1994 when it terminated the development of the IFR.¶ – Since then, other nations — China, India, Japan, South Korea, Russia, France — have proceeded to work on their own fast-reactor versions, which necessarily will involve instituting a fuel-processing capability.¶ – Thus the United States is being left behind, and is rapidly losing its ability to help assure that the global evolution of the technology of nuclear energy proceeds in a safe and orderly manner.¶ – But maybe it’s not too late yet. After all, the IFR is the fast-reactor technology with the post promise (for a variety of reasons), and is ready for a commercial-scale demonstration to settle some uncertainties about how to scale up the pyroprocess as needed, to establish better limits on the expected cost of production units, and to develop an appropriate, expeditious licensing process.¶ – Such a demo will require federal seed money. It’s time to get moving.

#### Several impacts – 1st prolif

#### Transition to IFRs create a global proliferation resistant fuel cycle

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "Q%26A on Integral Fast Reactors – safe, abundant, non-polluting power," 9/18/10) [http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http://bravenewclimate.com/2010/09/18/ifr-fad-7/](http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http%3A//bravenewclimate.com/2010/09/18/ifr-fad-7/)

Thermal reactors with reprocessing would do at least a little better.¶ Recycling (it would be with the PUREX process, or an equivalent) could stretch the U-235 supply another few decades—but remember the consequences: growing stockpiles of plutonium, pure plutonium streams in the PUREX plants, and the creation of 100,000-year plutonium mines.¶ If you’re going to talk about “PUREX” and “plutonium mines” you should say what they are. First, what’s PUREX?¶ It’s a chemical process developed for the nuclear weapons program, to separate plutonium from everything else that comes out of a reactor. Weapons require very pure plutonium, and that’s what PUREX delivers. The pyroprocess used in the IFR is very different. It not only does not, it cannot, produce plutonium with the chemical purity needed for weapons.¶ Why do you keep referring to “chemical” purity?¶ Because chemical and isotopic quality are two different things. Plutonium for a weapon has to be pure chemically. Weapons designers also want good isotopic quality—that is, they want at least 93% of their plutonium to consist of the isotope Pu- 239. A chemical process does not separate isotopes.¶ I see. Now, what about the “plutonium mines?”¶ When spent fuel or vitrified reprocessing waste from thermal reactors is buried, the result is a concentrated geological deposit of plutonium. As its radioactivity decays, those deposits are sources of raw material for weapons, becoming increasingly attractive over the next 100,000 years and more (the half-life of Pu-239 being 24,000 years).¶ You listed, back at the beginning, some problems that the IFR would ameliorate. A lot of those problems are obviously related to proliferation of nuclear weapons.¶ Definitely. For instance, although thermal reactors consume more fuel than they produce, and thus are not called “breeders,” they inescapably are prolific breeders of plutonium, as I said. And that poses serious concerns about nuclear proliferation. 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Both uranium and plutonium are of proliferation concern.¶ Where is the best place for plutonium?¶ Where better than in a reactor plant—particularly an IFR facility, where there is never pure plutonium (except some, briefly, when it comes in from dismantled weapons), where the radioactivity levels are lethal, and where the operations are done remotely under an inert, smothering atmosphere? Once enough IFRs are deployed, there never will need to be plutonium outside a reactor plant—except for the then diminishing supply of plutonium left over from decades of thermal-reactor operation.¶ How does the IFR square with U.S. policy of discouraging plutonium production, reprocessing and use?¶ It is entirely consistent with the intent of that policy—to render plutonium as inaccessible for weapons use as possible. 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#### New proliferators will be uniquely destabilizing -- guarantees conflict escalation.

Cimbala, ‘8

[Stephen, Distinguished Prof. Pol. Sci. – Penn. State Brandywine, Comparative Strategy, “Anticipatory Attacks: Nuclear Crisis Stability in Future Asia”, 27, InformaWorld]

If the possibility existed of a mistaken preemption during and immediately after the Cold War, between the experienced nuclear forces and command systems of America and Russia, then it may be a matter of even more concern with regard to states with newer and more opaque forces and command systems. In addition, the Americans and Soviets (and then Russians) had a great deal of experience getting to know one another’s military operational proclivities and doctrinal idiosyncrasies, including those that might influence the decision for or against war. Another consideration, relative to nuclear stability in the present century, is that the Americans and their NATO allies shared with the Soviets and Russians a commonality of culture and historical experience. Future threats to American or Russian security from weapons of mass destruction may be presented by states or nonstate actors motivated by cultural and social predispositions not easily understood by those in the West nor subject to favorable manipulation during a crisis. The spread of nuclear weapons in Asia presents a complicated mosaic of possibilities in this regard. States with nuclear forces of variable force structure, operational experience, and command-control systems will be thrown into a matrix of complex political, social, and cultural crosscurrents contributory to the possibility of war. In addition to the existing nuclear powers in Asia, others may seek nuclear weapons if they feel threatened by regional rivals or hostile alliances. Containment of nuclear proliferation in Asia is a desirable political objective for all of the obvious reasons. Nevertheless, the present century is unlikely to see the nuclear hesitancy or risk aversion that marked the Cold War, in part, because the military and political discipline imposed by the Cold War superpowers no longer exists, but also because states in Asia have new aspirations for regional or global respect.12 The spread of ballistic missiles and other nuclear-capable delivery systems in Asia, or in the Middle East with reach into Asia, is especially dangerous because plausible adversaries live close together and are already engaged in ongoing disputes about territory or other issues.13 The Cold War Americans and Soviets required missiles and airborne delivery systems of intercontinental range to strike at one another’s vitals. But short-range ballistic missiles or fighter-bombers suffice for India and Pakistan to launch attacks at one another with potentially “strategic” effects. China shares borders with Russia, North Korea, India, and Pakistan; Russia, with China and NorthKorea; India, with Pakistan and China; Pakistan, with India and China; and so on. The short flight times of ballistic missiles between the cities or military forces of contiguous states means that very little time will be available for warning and attack assessment by the defender. Conventionally armed missiles could easily be mistaken for a tactical nuclear first use. Fighter-bombers appearing over the horizon could just as easily be carrying nuclear weapons as conventional ordnance. In addition to the challenges posed by shorter flight times and uncertain weapons loads, potential victims of nuclear attack in Asia may also have first strike–vulnerable forces and command-control systems that increase decision pressures for rapid, and possibly mistaken, retaliation. This potpourri of possibilities challenges conventional wisdom about nuclear deterrence and proliferation on the part of policymakers and academic theorists. For policymakers in the United States and NATO, spreading nuclear and other weapons of mass destruction in Asia could profoundly shift the geopolitics of mass destruction from a European center of gravity (in the twentieth century) to an Asian and/or Middle Eastern center of gravity (in the present century).14 This would profoundly shake up prognostications to the effect that wars of mass destruction are now passe, on account of the emergence of the “Revolution in Military Affairs” and its encouragement of information-based warfare.15 Together with this, there has emerged the argument that large-scale war between states or coalitions of states, as opposed to varieties of unconventional warfare and failed states, are exceptional and potentially obsolete.16 The spread of WMD and ballistic missiles in Asia could overturn these expectations for the obsolescence or marginalization of major interstate warfare.

#### Extinction.

Krieger, ‘9

[David, Pres. Nuclear Age Peace Foundation and Councilor – World Future Council, “Still Loving the Bomb After All These Years”, 9-4, https://www.wagingpeace.org/articles/2009/09/04\_krieger\_newsweek\_response.php?krieger]

Jonathan Tepperman’s article in the September 7, 2009 issue of Newsweek, “Why Obama Should Learn to Love the Bomb,” provides a novel but frivolous argument that nuclear weapons “may not, in fact, make the world more dangerous….” Rather, in Tepperman’s world, “The bomb may actually make us safer.” Tepperman shares this world with Kenneth Waltz, a University of California professor emeritus of political science, who Tepperman describes as “the leading ‘nuclear optimist.’” Waltz expresses his optimism in this way: “We’ve now had 64 years of experience since Hiroshima. It’s striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states.” Actually, there were a number of proxy wars between nuclear weapons states, such as those in Korea, Vietnam and Afghanistan, and some near disasters, the most notable being the 1962 Cuban Missile Crisis. Waltz’s logic is akin to observing a man falling from a high rise building, and noting that he had already fallen for 64 floors without anything bad happening to him, and concluding that so far it looked so good that others should try it. Dangerous logic! Tepperman builds upon Waltz’s logic, and concludes “that all states are rational,” even though their leaders may have a lot of bad qualities, including being “stupid, petty, venal, even evil….” He asks us to trust that rationality will always prevail when there is a risk of nuclear retaliation, because these weapons make “the costs of war obvious, inevitable, and unacceptable.” Actually, he is asking us to do more than trust in the rationality of leaders; he is asking us to gamble the future on this proposition. “The iron logic of deterrence and mutually assured destruction is so compelling,” Tepperman argues, “it’s led to what’s known as the nuclear peace….” But if this is a peace worthy of the name, which it isn’t, it certainly is not one on which to risk the future of civilization. One irrational leader with control over a nuclear arsenal could start a nuclear conflagration, resulting in a global Hiroshima. Tepperman celebrates “the iron logic of deterrence,” but deterrence is a theory that is far from rooted in “iron logic.” It is a theory based upon threats that must be effectively communicated and believed. Leaders of Country A with nuclear weapons must communicate to other countries (B, C, etc.) the conditions under which A will retaliate with nuclear weapons. The leaders of the other countries must understand and believe the threat from Country A will, in fact, be carried out. The longer that nuclear weapons are not used, the more other countries may come to believe that they can challenge Country A with impunity from nuclear retaliation. The more that Country A bullies other countries, the greater the incentive for these countries to develop their own nuclear arsenals. Deterrence is unstable and therefore precarious. Most of the countries in the world reject the argument, made most prominently by Kenneth Waltz, that the spread of nuclear weapons makes the world safer. These countries joined together in the Nuclear Non-Proliferation Treaty (NPT) to prevent the spread of nuclear weapons, but they never agreed to maintain indefinitely a system of nuclear apartheid in which some states possess nuclear weapons and others are prohibited from doing so. The principal bargain of the NPT requires the five NPT nuclear weapons states (US, Russia, UK, France and China) to engage in good faith negotiations for nuclear disarmament, and the International Court of Justice interpreted this to mean complete nuclear disarmament in all its aspects. Tepperman seems to be arguing that seeking to prevent the proliferation of nuclear weapons is bad policy, and that nuclear weapons, because of their threat, make efforts at non-proliferation unnecessary and even unwise. If some additional states, including Iran, developed nuclear arsenals, he concludes that wouldn’t be so bad “given the way that bombs tend to mellow behavior.” Those who oppose Tepperman’s favorable disposition toward the bomb, he refers to as “nuclear pessimists.” These would be the people, and I would certainly be one of them, who see nuclear weapons as presenting an urgent danger to our security, our species and our future. Tepperman finds that when viewed from his “nuclear optimist” perspective, “nuclear weapons start to seem a lot less frightening.” “Nuclear peace,” he tells us, “rests on a scary bargain: you accept a small chance that something extremely bad will happen in exchange for a much bigger chance that something very bad – conventional war – won’t happen.” But the “extremely bad” thing he asks us to accept is the end of the human species. Yes, that would be serious. He also doesn’t make the case that in a world without nuclear weapons, the prospects of conventional war would increase dramatically. After all, it is only an unproven supposition that nuclear weapons have prevented wars, or would do so in the future. We have certainly come far too close to the precipice of catastrophic nuclear war. As an ultimate celebration of the faulty logic of deterrence, Tepperman calls for providing any nuclear weapons state with a “survivable second strike option.” Thus, he not only favors nuclear weapons, but finds the security of these weapons to trump human security. Presumably he would have President Obama providing new and secure nuclear weapons to North Korea, Pakistan and any other nuclear weapons states that come along so that they will feel secure enough not to use their weapons in a first-strike attack. Do we really want to bet the human future that Kim Jong-Il and his successors are more rational than Mr. Tepperman?

#### 2nd terrorism – Nuclear terrorism is extremely likely

**Jaspal 12** – Associate Professor at the School of Politics and International Relations, Quaid-i-Azam University, Islamabad, Pakistan

(Zafar Nawaz, “Nuclear/Radiological Terrorism: Myth or Reality?”, Journal of Political Studies, Vol. 19, Issue - 1, 2012, 91:111, dml)

The misperception, miscalculation and above all ignorance of the ruling elite about security puzzles **are perilous** for the national security of a state. Indeed, in an age of transnational terrorism and **unprecedented dissemination of dualuse nuclear technology**, ignoring nuclear terrorism threat is an imprudent policy choice. The incapability of terrorist organizations to engineer fissile material **does not eliminate** completely the possibility of nuclear terrorism. At the same time, the absence of an example or precedent of a nuclear/ radiological terrorism **does not qualify the assertion** that the nuclear/radiological terrorism ought to be remained a myth. Farsighted rationality obligates that one should not miscalculate **transnational terrorist groups** — whose behavior suggests that they have a death wish — of acquiring nuclear, radiological, chemical and biological material producing capabilities. In addition, one could be sensible about the published information that **huge amount of nuclear material** is spread around the globe. According to estimate it is enough to build **more than** 120,000 **Hiroshima-sized nuclear bombs** (Fissile Material Working Group, 2010, April 1). The alarming fact is that a few storage sites of nuclear/radiological materials **are inadequately secured** and continue to be accumulated in unstable regions (Sambaiew, 2010, February). Attempts at stealing fissile material had already been discovered (Din & Zhiwei, 2003: 18). Numerous evidences confirm **that terrorist groups had aspired to acquire fissile material** for their terrorist acts. Late Osama bin Laden, the founder of al Qaeda stated that acquiring nuclear weapons was a“religious duty” (Yusufzai, 1999, January 11). The IAEA also reported that “al-Qaeda was actively seeking an atomic bomb.” Jamal Ahmad al-Fadl, a dissenter of Al Qaeda, in his trial testimony had “revealed his extensive but unsuccessful efforts to acquire enriched uranium for al-Qaeda” (Allison, 2010, January: 11). On November 9, 2001, Osama bin Laden claimed that “we have chemical and nuclear weapons as a deterrent and if America used them against us we reserve the right to use them (Mir, 2001, November 10).” On May 28, 2010, Sultan Bashiruddin Mahmood, a Pakistani nuclear scientist confessed that he met Osama bin Laden. He claimed that “I met Osama bin Laden before 9/11 not to give him nuclear know-how, but to seek funds for establishing a technical college in Kabul (Syed, 2010, May 29).” He was arrested in 2003 and after extensive interrogation by American and Pakistani intelligence agencies he was released (Syed, 2010, May 29). Agreed, Mr. Mahmood did not share nuclear know-how with Al Qaeda, but his meeting with Osama establishes the fact that the terrorist organization was in contact with nuclear scientists. Second, the terrorist group **has sympathizers in the nuclear scientific bureaucracies**. It also authenticates bin Laden’s Deputy Ayman Zawahiri’s claim which he made in December 2001: “If you have $30 million, go to the black market in the central Asia, contact any disgruntled Soviet scientist and a lot of dozens of smart briefcase bombs are available (Allison, 2010, January: 2).” The covert meetings between nuclear scientists and al Qaeda members **could not be interpreted as idle threats** and thereby the threat of nuclear/radiological terrorism is real. The 33Defense Secretary Robert Gates admitted in 2008 that “what keeps every senior government leader awake at night is the thought of a terrorist ending up with a weapon of mass destruction, especially nuclear (Mueller, 2011, August 2).” Indeed, **the nuclear deterrence strategy** cannot deter **the transnational terrorist syndicate** from nuclear/radiological terrorist attacks. Daniel Whiteneck pointed out: “**Evidence suggests**, for example, that al Qaeda might not only use WMD simply to demonstrate the magnitude of its capability but that it might actually welcome **the escalation of a strong U.S. response**, **especially if it included** catalytic effects **on governments** and societies in the Muslim world. An adversary that prefers escalation regardless of the consequences cannot be deterred” (Whiteneck, 2005, Summer: 187) Since taking office, President Obama has been reiterating that “nuclear weapons represent the ‘gravest threat’ to United States and international security.” While realizing that the US could not prevent nuclear/radiological terrorist attacks singlehandedly, he launched 47an international campaign to convince the international community about the increasing threat of nuclear/ radiological terrorism. He stated on April 5, 2009: “Black market trade in nuclear secrets and nuclear materials abound. The technology to build a bomb has spread. Terrorists are determined to buy, build or steal one. Our efforts to contain these dangers are centered on **a global non-proliferation regime**, but as more people and nations break the rules, we could reach the point where **the center cannot hold** (Remarks by President Barack Obama, 2009, April 5).” He added: “One terrorist with one nuclear weapon could unleash massive destruction. Al Qaeda has said it seeks a bomb and that it would have no problem with using it. And we know that there is unsecured nuclear material across the globe” (Remarks by President Barack Obama, 2009, April 5). In July 2009, at the G-8 Summit, President Obama announced the convening of a Nuclear Security Summit in 2010 to deliberate on the mechanism to “secure nuclear materials, combat nuclear smuggling, and prevent nuclear terrorism” (Luongo, 2009, November 10). President Obama’s nuclear/radiological threat perceptions were also accentuated by the United Nations Security Council (UNSC) Resolution 1887 (2009). The UNSC expressed its grave concern regarding ‘the threat of nuclear terrorism.” It also recognized the need for all States “to take effective measures to prevent nuclear material or technical assistance becoming available to terrorists.” The UNSC Resolution called “for universal adherence to the Convention on Physical Protection of Nuclear Materials and its 2005 Amendment, and the Convention for the Suppression of Acts of Nuclear Terrorism.” (UNSC Resolution, 2009) The United States Nuclear Posture Review (NPR) document revealed on April 6, 2010 declared that “terrorism and proliferation are far greater threats **to the United States and international stability**.” (Security of Defence, 2010, April 6: i). The United States declared that it reserved the right to“hold fully accountable” any state or group “that supports or enables terrorist efforts to obtain or use weapons of mass destruction, whether by facilitating, financing, or providing expertise or safe haven for such efforts (Nuclear Posture Review Report, 2010, April: 12)”. This declaration underscores the possibility that terrorist groups could acquire fissile material from the rogue states.

#### And, wet pool storage facilities are uniquely vulnerable now

Werner, 12 [U.S. Spent Nuclear Fuel Storage James D. Werner Section Research Manager May 24, 2012, http://www.fas.org/sgp/crs/misc/R42513.pdf]

The locations of SNF wet pool storage in relation to the associated nuclear reactor may present potential risks associated with those designs. For example, most boiling water reactors (BWRs) in the United States, including the GE Mark I, are designed with the SNF storage pool located inside the same secondary containment structure as the reactor and many critical control systems, and located well above ground level. Many have expressed concern that this design may pose safety risks because any problems with the reactor can affect the SNF storage pools, and vice versa.135 For example, in a loss of off-site power situation, such as occurred at the GE Mark I reactors in Fukushima, Japan, the SNF pool may also lose power, affecting the cooling water and monitoring systems. In the case of the incident in Japan, elevated radiation near the reactor hindered personnel from mitigating problems or monitoring the SNF storage pools. In addition, the height of the SNF pools in many BWRs (more than 100 feet above ground level) could also pose safety risks because of the elevated access challenge and potential for a loss of coolant in a structural failure, compared to reactors with the SNF storage pools at or below ground level. Prior to the Fukushima Dai-ichi incident, the biggest change in the risk profile for SNF storage occurred in the wake of the September 11, 2001, terrorist attacks, after which a congressionally mandated National Academy of Sciences report concluded that “attacks with civilian aircraft remain a credible threat.”136 NAS indicated that terrorists might choose to attack spent nuclear fuel pools because they are “less well protected structurally than reactor cores**”** and “typically contain inventories of medium- and long-lived radionuclides that are several times greater than those contained in reactor cores.”137 In response, NRC issued a series of orders and letters to licensees, the contents of which are confidential. NRC also conducted site-specific evaluations to review individual site risks and readiness, resulting in site modifications, the details of which are also confidential. Although the reviews, orders, and letters resulted in numerous incremental improvements to SNF storage facilities and operations, such as improved backup power supply reliability, there was no large-scale shift of SNF out of wet pools and into dry casks, nor was there a mandate to move SNF into hardened storage facilities.

#### And, the only impediment to escalating terror is access to spent fuel

NTI, 12 [Nuclear Threat Initiative, August 1st,“Why Is Highly Enriched Uranium a Threat?”, <http://www.nti.org/analysis/reports/civilian-heu-reduction-and-elimination/>]

Why Is Highly Enriched Uranium a Threat? The most difficult challenge for a terrorist organization seeking to build a nuclear weapon or [improvised nuclear device](http://www.nti.org/glossary/improvised-nuclear-device-ind/) is obtaining [fissile material](http://www.nti.org/glossary/fissile-material/), either [plutonium](http://www.nti.org/glossary/plutonium-pu/) or [highly enriched uranium (HEU)](http://www.nti.org/glossary/highly-enriched-uranium-heu/). HEU, [uranium](http://www.nti.org/glossary/uranium/) that has been processed to increase the proportion of the U-235 [isotope](http://www.nti.org/glossary/isotope/) to over 20%, is required for the construction of a [gun-type nuclear device](http://www.nti.org/glossary/gun-type-nuclear-weapon/), the simplest type of nuclear weapon. The greater the proportion of U-235 (i.e. the higher the [enrichment](http://www.nti.org/glossary/enriched-uranium/) level), the less material is needed for a nuclear explosive device. [Weapons-grade uranium](http://www.nti.org/glossary/weapons-grade-material/) generally refers to uranium enriched to at least 90%, but material of far lower enrichment levels, found in both fresh and [spent nuclear fuel](http://www.nti.org/glossary/spent-nuclear-fuel/), can be used to create a nuclear explosive device. In 2002, the U.S. National Research Council warned that "crude HEU weapons could be fabricated without state assistance," noting that "the primary impediment that prevents countries or technically competent terrorist groups from developing nuclear weapons is the availability of [nuclear material], especially HEU."[1] Creating a nuclear weapon from HEU is technically easier than building a [plutonium](http://www.nti.org/glossary/plutonium-pu/) weapon. Moreover, current technology is unlikely to detect a shielded nuclear device on a truck or boat. Therefore, securing and eliminating stocks of HEU is the surest way to decrease the risk that terrorist groups could use this material to create a nuclear explosion. Where Is Civilian HEU Located? Experts estimate that approximately 70 tons of HEU are used in civilian applications worldwide. [2] As little as 25 kilograms (kg) of U-235 (which amounts to about 28kg of HEU enriched to 90%) is needed to produce a nuclear weapon; about 40-60kg is needed for a cruder nuclear device. [3] Bomb-grade material can be obtained from HEU that is fresh (unirradiated), and [irradiated](http://www.nti.org/glossary/irradiate/) (also referred to as spent). Fresh and lightly irradiated fuel (such as fuel used in critical assemblies and pulse reactors) is not significantly [radioactive](http://www.nti.org/glossary/radioactivity/), and is therefore relatively safe to handle. Although using nuclear fuel in high-powered reactors initially makes it highly radioactive and thus very difficult to handle safely (often this fuel is referred to as "self-protecting"), [spent fuel](http://www.nti.org/glossary/spent-nuclear-fuel/) loses its radioactivity over time, making it easier to handle and potentially more attractive to terrorists. HEU is currently used in the civilian sphere to fuel [research reactors](http://www.nti.org/glossary/research-reactor/), critical assemblies, pulsed reactors, and a few fast reactors. According to the [International Atomic Energy Agency (IAEA)](http://www.nti.org/glossary/international-atomic-energy-agency/), 244 research reactors are in operation or temporarily shut down across 56 countries. A further 441 reactors have been shut down or decommissioned, while eight are planned or under construction. [4] Many of the research reactors that have been shut down, but not decommissioned, have spent HEU fuel on-site. The IAEA database notes that over 20,000 spent fuel assemblies from research reactors are enriched to levels above 20 percent. Nearly half of these stored fuel assemblies are enriched to levels at or above 90 percent.[5] That said, there is no current comprehensive, authoritative inventory of civil HEU globally, which is a major obstacle to progress in this area. According to the Government Accountability Office, even the [United States](http://www.nti.org/country-profiles/united-states/) has failed to maintain an accurate inventory of the HEU that it has exported over the years as attempts to balance the books could only account for 10 percent of the material. [6] The United States and the [Soviet Union](http://www.nti.org/country-profiles/russia/) supplied much of the HEU fuel used in research reactors world-wide. Other producers include [China](http://www.nti.org/country-profiles/china/) (which sent HEU fuel for research reactors to Nigeria, Ghana, [Iran](http://www.nti.org/country-profiles/iran/), [Pakistan](http://www.nti.org/country-profiles/pakistan/), and [Syria](http://www.nti.org/country-profiles/syria/), as well as enriched uranium to [South Africa](http://www.nti.org/country-profiles/south-africa/), and [Argentina](http://www.nti.org/country-profiles/argentina/)); [France](http://www.nti.org/country-profiles/france/) (to Chile and [India](http://www.nti.org/country-profiles/india/)); the [United Kingdom](http://www.nti.org/country-profiles/united-kingdom/) (to [Australia](http://www.nti.org/country-profiles/australia/), India, and [Japan](http://www.nti.org/country-profiles/japan/)); and South Africa (which did not export this fuel).[7] Before 1978, when Washington and Moscow became concerned about the implications of their exports of highly enriched fuels, most of the fuel supplied by the United States (the bulk of which went to North American and the Asia-Pacific), was of very high enrichment levels (90% and above). The Soviet-supplied fuel, chiefly sent to Eastern Europe, was typically 80% enriched. Under several U.S.-led initiatives, many countries have returned HEU fuel, both fresh and spent, to its country of origin in order to reduce the risk of theft. HEU is also used in targets in reactors that produce [medical isotopes](http://www.nti.org/glossary/medical-isotopes/). HEU is used for this purpose annually in reactors in Belgium, Canada, France, the Netherlands, and Russia.[8] Other countries, including Australia and [Indonesia](http://www.nti.org/country-profiles/indonesia/), have begun producing these isotopes with [LEU](http://www.nti.org/glossary/low-enriched-uranium-leu/) targets, and still other countries, such as [Egypt](http://www.nti.org/country-profiles/egypt/), are currently developing and implementing their LEU target-based production process. [9] In particular, South Africa—a major exporter—converted its Safari-1 reactor to rely on both LEU targets and fuel for the production of [medical isotopes](http://www.nti.org/glossary/radioisotope/). Most of the other major producers of medical isotopes, including Canada, the Netherlands, and France, utilize LEU fuels in their reactors, but continue to rely on HEU targets. However, a number of these countries, particularly in Western Europe, have pledged to convert to LEU targets. Progress towards fuller use of LEU is not universal, however. A Russian project, for example, aims to produce enough molybdenum-99 using HEU fuel and targets to satisfy 20 percent of global demand by 2015. [10] In addition to use in research and test reactors and for medical isotope production, HEU is used in naval propulsion and space propulsion research. The material is also used for testing fast reactor core designs using [mixed oxide (MOX) fuel](http://www.nti.org/glossary/mixed-oxide-mox-fuel/). For further information on HEU in civilian applications, see [Civilian Uses of HEU](http://www.nti.org/analysis/articles/civilian-uses-heu/). Security of Civilian HEU Many civilian facilities with HEU on-site do not have adequate security. The IAEA reported that during one of its missions, it discovered a research reactor with HEU that "was observed to have essentially no physical protection." [11] The IAEA assisted the facility with enhancing its security, but reported that overall, "deficiencies remain in the legal, administrative, and technical arrangements for controlling and protecting nuclear materials ... in many countries." [12] The U.S. Department of Energy has been assisting with physical protection upgrades for 22 foreign research reactors through the Global Research Reactor Program. A September 2009 GAO report found that while most sites that have received upgrades generally met IAEA security guidelines, in some cases, critical security weaknesses remained. [23] It is not a simple matter to upgrade security measures; the majority of the world's research reactors are located in universities or other publicly accessible research centers. While security concerns have dramatically increased since 9/11, it is difficult to reconfigure a site that was not built with physical protection in mind. Storage of spent fuel stocks is generally even less secure than fresh fuel stocks, as until a few years ago spent nuclear fuel was considered "self-protecting" and few facilities wanted to spend money securing a material that was no longer of economic value. It is far more effective to remove this material from vulnerable locations than to attempt to increase security on-site. Programs to Reduce and Eliminate HEU There have been efforts to reduce the amount of HEU at civilian facilities since 1978, when Washington initiated the [Reduced Enrichment for Research and Test Reactors (RERTR) Program](http://www.nti.org/glossary/rertr-program/). Moscow also began its own program to reduce enrichment at Soviet-built research reactors outside of the Soviet Union, and changed its HEU export policies, supplying these reactors with 36% HEU in lieu of 80% HEU. In the past 25 years, many countries have cooperated with the RERTR program or initiated their own, similar programs. In May 2004, the U.S. Department of Energy launched the [Global Threat Reduction Initiative (GTRI](http://www.nti.org/glossary/global-threat-reduction-initiative/)), which the IAEA, Russia, and others have since joined. Among its goals, the GTRI seeks to "minimize and eventually eliminate any reliance on HEU in the civilian fuel cycle, including conversion of research and test reactors worldwide from the use of HEU to the use of LEU fuel and targets." As of early 2012, U.S.-led efforts have converted to LEU or verified the shut down of 88 HEU-fueled facilities.[14] The RERTR program is also working on the conversion of a handful of medical isotope producers that use HEU targets in their reactors. The program includes some of the largest producers of medical isotopes, located in Europe. To date, the RERTR program has helped to successfully convert isotope-producing reactors in Argentina and South Africa. At present, there are no longer any technical barriers to conversion to LEU and only political and financial issues remain. [15] Besides converting facilities to use LEU fuel and targets, there have also been efforts to consolidate fresh and spent HEU fuel at a smaller number of relatively secure locations. This has involved removing the fuel, mostly to the United States and Russia, from other countries, as well as consolidating the fuel within countries. U.S. programs in this area (the Russian Research Reactor Fuel Return program to repatriate fuel to Russia, and the Foreign Research Reactor Spent Nuclear Fuel Acceptance Program to repatriate U.S.-origin fuel), have all been subsumed under the 2004 GTRI initiative. Together, the two programs have returned over 2,735kg of spent and fresh HEU fuel to the United States and Russia as of 2012. [16] According to the IAEA's definition of the quantity of HEU necessary to construct a nuclear explosive device, the amount of repatriated HEU is equivalent to up to 80 weapons. [17] Despite the progress of these efforts, many HEU sites remain worldwide, with a significant portion of them located in Russia. [26] A related program, the Material Consolidation and Conversion (MCC) project, established in 1999, reduces this excess Russian civilian HEU by blending it down into LEU. As of the end of 2011, approximately 13.5 of an estimated 17 tons of U-235 in excess Russian civilian HEU had been blended down. [18] Both the United States and Russia also have large quantities of excess HEU from their defense programs. In Russia, excess HEU from weapons is blended down to LEU within the framework of the Megatons to Megawatts program (also known as the [HEU-LEU program](http://www.nti.org/glossary/heu-deal/)). The resulting LEU is then released for civilian use. The program will end in 2013, at which point 500 tons of HEU will have been downblended. [19] The United States initially declared some 174 metric tons of HEU as excess to military needs, designating this material as civilian. [20] An additional 200 metric tons were officially removed from the U.S. weapons stockpile in November 2005. [21]

#### That’s key to the nuclear taboo – solves nuclear war

Bin ‘9(5-22-09 About the Authors Prof. Li Bin is a leading Chinese expert on arms control and is currently the director of Arms Control Program at the Institute of International Studies, Tsinghua University. He received his Bachelor and Master Degrees in Physics from Peking University before joining China Academy of Engineering Physics (CAEP) to pursue a doctorate in the technical aspects of arms control. He served as a part-time assistant on arms control for the Committee of Science, Technology and Industry for National Defense (COSTIND).Upon graduation Dr. Li entered the Institute of Applied Physics and Computational Mathematics (IAPCM) as a research fellow and joined the COSTIND technical group supporting Chinese negotiation team on Comprehensive Test Ban Treaty (CTBT). He attended the final round of CTBT negotiations as a technical advisor to the Chinese negotiating team. Nie Hongyi is an officer in the People’s Liberation Army with an MA from China’s National Defense University and a Ph.D. in International Studies from Tsinghua University, which he completed in 2009 under Prof. Li Bin. )

The nuclear taboo is a kind of international norm and this type of norm is supported by the promotion of the norm through international social exchange. But at present the increased **threat of nuclear terrorism has lowered people’s confidence that nuclear weapons will not be used**. China and the United States have a broad common interest in combating nuclear terrorism. **Using technical and institutional measures to break the foundation of nuclear terrorism and lessen the possibility of a nuclear terrorist attack can** not only weaken the danger of nuclear terrorism itself but also **strengthen people’s confidence in the nuclear taboo**, and in this way preserve an international environment beneficial to both China and the United States. In this way **even if there is crisis** in China-U.S. relations caused by conflict, **the nuclear taboo can** also help both countries **reduce suspicions** about the nuclear weapons problem, **avoid miscalculation and thereby reduce the danger of a nuclear war.**

#### Terrorism Causes extinction – retal

**Ayson 10** (Robert, Professor of Strategic Studies, Director of Strategic Studies: New Zealand, Senior Research Associate with Oxford’s Centre for International Studies. “After a Terrorist Nuclear Attack: Envisaging Catalytic Effects. Studies in Conflict and Terrorism, Volume 33, Issue 7, July 2010, pages 571-593)

Washington's early response to a terrorist nuclear attack on its own soil might also raise the possibility of an unwanted (and nuclear aided) confrontation with Russia and/or China. For example, in the noise and confusion during the immediate aftermath of the terrorist nuclear attack, the U.S. president might be expected to place the country's armed forces, including its nuclear arsenal, on a higher stage of alert. In such a tense environment, when careful planning runs up against the friction of reality, it is just possible that Moscow and/or China might mistakenly read this as a sign of U.S. intentions to use force (and possibly nuclear force) against them. In that situation, the temptations to preempt such actions might grow, although it must be admitted that any preemption would probably still meet with a devastating response. As part of its initial response to the act of nuclear terrorism (as discussed earlier) Washington might decide to order a significant conventional (or nuclear) retaliatory or disarming attack against the leadership of the terrorist group and/or states seen to support that group. Depending on the identity and especially the location of these targets, Russia and/or China might interpret such action as being far too close for their comfort, and potentially as an infringement on their spheres of influence and even on their sovereignty. One far-fetched but perhaps not impossible scenario might stem from a judgment in Washington that some of the main aiders and abetters of the terrorist action resided somewhere such as Chechnya, perhaps in connection with what Allison claims is the “Chechen insurgents' … long-standing interest in all things nuclear.”42 American pressure on that part of the world would almost certainly raise alarms in Moscow that …might require a degree of advanced consultation from Washington that the latter found itself unable or unwilling to provide.

#### And, the plan solves unauthorized diversion

**Archambeau et al 11** – Science Council for Global Initiatives

(Charles, with Randolph Ware, Tom Blees, Barry Brook, Yoon Chang, Jerry Peterson, Robert Serafin, Joseph Shuster, Evgeny Velikhov, and Tom Wigley, “The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs”, google it, dml)

Pyroprocessing was originally developed for integration with a fast reactor, but it can also be used in a stand-alone mode to **treat spent fuel** from today's commercial reactors with the addition of a front-end step to convert the used oxide fuel to metallic form. **Pyroprocessing** eliminates **the ability to use the reactor's nuclear materials directly in weapons** because it cannot separate out any Plutonium (Pu). Instead, it keeps the major nuclear fuels, Uranium and Plutonium mixed, at all times, with other actinides and fission products. This mixture is protected **against theft or unauthorized diversion** because the mixture is extremely radioactive and must be handled remotely with sophisticated and specialized equipment.

#### IFR key

**Archambeau et al 11** – Science Council for Global Initiatives

(Charles, with Randolph Ware, Tom Blees, Barry Brook, Yoon Chang, Jerry Peterson, Robert Serafin, Joseph Shuster, Evgeny Velikhov, and Tom Wigley, “The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs”, google it, dml)

The pyroprocessor unit can be used as a stand-alone system to process LWR waste from any open cycle reactor into fuel for IFR closed cycle reactors. The depleted Uranium produced by the enrichment of Uranium ore can also be processed to generate additional IFR fuel. The current amount of LWR waste, plus the amount of depleted Uranium in stock piles world-wide, is sufficient to supply fuel to all the IFR plants needed and in fact to supply the world's required energy for about 1000 years.3 The problem of storage of current LWR waste and depleted Uranium waste from refining of mined Uranium is therefore solved by pyroprocessor generation of IFR fuel, along with a relatively small mass of short-lived fission products which can be easily and safely stored. Uranium can also be extracted from sea water using IFR power sources (see, for example, Cohen, 1983). Because Uranium is constantly added to seawater by erosion processes, then the IFR fuel source is effectively unlimited. Therefore, IFR power plants do not require fuel from regular mining operations, as does a LWR powered plant, but can use pyroprocessor generated fuel essentially indefinitely. In this sense the IFR is a "renewable" energy source which can be expanded, essentially indefinitely, to meet demand.

#### 3rd competitiveness – US is ceding nuclear competitiveness now

**Barton 11** [Charles Barton, Nuclear Green, “Have the Chinese Been Reading Energy from Thorium or Nuclear Green?” 1/31/11]

Last week the Chinese Academy of Science announced that it planned to finance the development of a Chinese Thorium Breeding Molten Salt Reactor (TMSR) or as it is called in the United States, the Liquid Fluoride Thorium Reactor (LFTR). The announcement came in a news report from Weihui.news365.com.cn. The announcement was relayed to Westerners who were interested in Thorium breeding molten salt reactors in a discussion thread comment posted by Chinese Scientist Hua Bai, last Friday. Kirk Sorensen, Brian Wang, and I all posted about Bai's announcement on Sunday, January 30.¶ In addition to these posts, the thread which Hua Bai started contains the revelation that the engineer who heads the Chinese Molten Salt Reactor Project is none other than Jiang Mianheng, a son of Retired Chinese President, Jiang Zemin. In addition to being President of People's China, Jiang was the chairmanship of the powerful Central Military Commission, suggesting the likelihood that Jiang Mianheng has military ties. He is the cofounder of Semiconductor Manufacturing International Corporation, and a former lead researcher in the Chinese Space Program, as well as Vice President of the Chinese Academy of Sciences. The presence of such a well connected Chinese science leader suggests that the Chinese TMSR project is regarded as important by the Chinese leadership. Thus the Chinese leadership, unlike the American Political andscientific leadership has grasped the potential of molten salt nuclear technology.¶ Yesterday, "horos11" commented on my blog, Nuclear Green,¶ I read this, and I didn't know whether to laugh or cry.¶ After all, this site and others have been sounding the clarion call to action on this, and I should be glad that someone finally heeded it and its getting traction in a place that really matters, but I have a sinking feeling that:¶ a. its going to take far less than their planned 20 years¶ b. they are going to succeed beyond their wildest expectations.¶ Which means that the next, giant sucking sound we may hear is the sound of the 5 trillion dollar energy market heading east, further depressing our economy, weakening the dollar (and the euro) and ultimately making the US economy dependent on rescue from the chinese in the future (when they are done rescuing themselves).¶ Yet, in the large scheme of things, this is a definite good, and may be our savior from anthropomorphic climate change.¶ so again, laugh? or cry. I guess its up to how you view things - I guess I'm tentatively laughing at the moment, but mostly from the overwhelming irony of all this.¶ Jason Ribeiro added,¶ I can't help but have a feeling of sour grapes about this. While I congratulate China for doing the obvious, America has its head buried so far in the sand it can't see straight. With all the internet clamor about LFTR that's been going on the internet in the past 3-4 years, it was the non-English speaking Chinese that finally got the message that this was a great idea worth investing in. Our leadership ought to be ashamed of themselves.¶ The Chinese News story on the Thorium Molten Salt Reactor reflects the clear Chinese thinking about the potential role of LFTRs in the future Chinese energy economy. I will paraphrase,¶ "the future of advanced nuclear fission energy - nuclear energy, thorium-based molten salt reactor system" project was officially launched. . . The scientific goal is to developed a new generation of nuclear energy systems [and to achieve commercial] use [in] 20 years or so. We intend to complete the technological research needed for this system and to assert intellectual property rights to this technology. Fossil fuel energy is being depleted, and solar and wind energy are not stable enough, while hydropower development has reached the limit of its potential.. . .¶ Nuclear power seems to offer us a very attractive future energy choice, high energy density, low carbon emissions, and the potential for sustainable development. . . . China has chosen {to make an energy] breakthrough in the direction of molten salt reactors. . . . this liquid fuel reactors has a simple structure and can run at atmospheric pressure, [it can use any fissionable material as fuel} and has other advantages. "This new stove" can be made very small, will operate with stabile nuclear fuel, and will run for several decades before replacement. After the thorium is completely used in the nuclear process the TMSR will produce nuclear waste will be only be one-thousandth of that produced by existing nuclear technologies.¶ As the world is still in the development of a new generation of nuclear reactors, the thorium-based independent research and development of molten salt reactors, will be possible to obtain all intellectual property rights. This will enable China to firmly grasp the lifeline of energy in their own hands.¶ Let the word "nuclear" no longer mean war.¶ In the past, people always talk about "core" colors. The Hiroshima atomic bomb, the Chernobyl nuclear power plant explosion, these are like a lingering nightmare that is marked in human history. But a new generation of nuclear power will take the color green, the mark of peace taking human beings into a new era.¶ Oh Wow! It sounds as if someone in China has been reading Nuclear Green or Energy from Thorium. And there is more!¶ In addition, the "new stove" operating at atmospheric pressure operation, rather than the traditional reactor operating at high pressure, will be simple and safe. "When the furnace temperature exceeds a predetermined value, in the bottom of the MSR core, a frozen plug of salt will automatically melt, releasing the liquid salt in the reactor core into an emergency storage tanks, and terminating the nuclear reaction," scientist Xu Hongjie told reporters, as the cooling agent is fluoride salts (the same salts that also carrying the nuclear fuel), after the liquid salt cools it turns solid, which prevents the nuclear fuel from leaking out of its containment, and thus will not pollute ground water causing an ecological disasters. The added safety opens up new possibilities for reactors, they can be built underground, completely isolating radioactive materials from the reactor, also the underground location will protect the reactor from an enemy's weapon attack. Reactors can be built in large cities, in the wilderness, or in remote villages.¶ Well Kirk Sorensen and I wanted our ideas to become national priorities. We just did not know in what country it would happen first. Unfortunately the leadership of the United States, continues to be determined to lead this nation into the wilderness of powerlessness, while the leadership of communist China is alert to the possibilities of a new energy age. Possibilities that can be realized by molten salt nuclear technology. Lets hope that someone in the White House or Congress wakes up. The Chinese understand the implications of their venture into Molten Salt nuclear technology. The American leadership does not.

#### Plan’s crucial to overall competitiveness

**Barton 10** (Charles Barton, Nuclear Green "Keeping up with China: The Economic Advantage of Molten Salt Nuclear Technology," 12/1/10)

American and European nuclear development can either proceed by following the cost lowering paths being pioneered in Asia, or begin to develop low cost innovative nuclear plans. Since low labor costs, represent the most significant Chinese and Indian cost advantage, it is unlikely that European and American reactor manufacturers will be able to compete with the Asians on labor costs. Labor costs for conventional reactors can be lowered by factory construction of reactor componant moduels, but the Chinese are clearly ahead of the West in that game. Yet the weakness of the Chinese system is the relatively large amount of field labor that the manufacture of large reactors requires.¶ The Chines system is to introduce labor saving devices where ever and when ever possible, but clearly shifting labor from the field to a factory still offers cost advantages. The more labor which can be performed in the factory, the more labor cost savings are possible. Other savings advantages are possible by simplifying reactor design, and lowering materials input. Building a reactor with less materials and fewer parts lowers nuclear costs directly and indirectly. Decreasing core size per unit of power output also can contribute a cost advantage. Direct saving relate to the cost of parts and matetials, but fewer parts and less material also means less labor is required to put things together, since there is less to put together. In addition a small reactor core structure, would, all other things being equal, require a smaller housing. Larger cores mean more structural housing expenses.¶ While the Pebel Bed Modular Reactor has a relatively simple core design, the actual core is quite large, because of the cooling inefficiency of helium. Thus, the simplisity of the PBMR core is ballanced by its size, its total materials input, and the size of its housing. The large core and housing requirements of the PBMR also adds to its labor costs, especially its field labor cost. Thus while the simplisity of the PBMR core design would seem to suggest a low cost, this expectation is unlikely to br born out in practice.¶ Transportation limits ability to shift production from the field to the factory. An analysis preformed by the University of Tennessee's, and the Massachusettes Institute of Technology's Departments of Nuclear Engineering looked at the 335 MW Westinghouse IRIS reactor. The analysis found,¶ A rough estimate of the weight for a 1000 MWt modular reactor and its secondary system, similar to the Westinghouse IRIS plant, is taken as the summation of all of the major components in the analysis. Many of the smaller subcomponents have been neglected. The containment structure contributes ~2.81E6 kg (3100 tons). The primary reactor vessel and the turbo-generator contribute ~1.45E6 kg (1600 tons) each. The heat exchange equipment and piping contribute ~6.78E5 kg (747 tons). Therefore, the total weight of the major plant components is~ 6.39E6 kg (7047 tons).¶ The weight and width of the IRIS would place constraints of barge transportation of the IRIS on the Tennessee and Ohio Rivers. The report stated,¶ The Westinghouse barge mounted IRIS reactor modules were limited in size based on input from the University of Tennessee. The barge dimension limitations were established to be 30 meters (98’-5”) wide, 100 meters (328’-1”) long, with a 2.74 meter (9’) draft. These dimensions establish the barge maximum displacement at 8,220 metric tons. In addition, the barge(s) are limited to ~20 meters (65’-7”) in height above the water surface, so that they fit under crossing bridges and can be floated up the Mississippi, Ohio, and Tennessee Rivers as far as the city of Chattanooga, Tennessee. Further movement above Chattanooga is currently limited by the locks at the Chickamauga Reservoir dam.¶ The above barge displacement limitation will impose severe limits on how much structural support and shield concrete can be placed in the barge modules at the shipyard. For example, the estimated weight of concrete in the IRIS containment and the surrounding cylindrical shield structure alone greatly exceeds the total allowable barge displacement. This however does not mean that barge- mounted pressurized water reactors (PWRs) are not feasible. It does mean that barge-mounted PWRs need to employ steel structures that are then used as the forms for the addition of needed concrete after the barge has been floated into its final location and founded.¶ Thus for the IRIS, barge transportation presented problems, and rail transportation was unthinkable. The core of the 125 MW B&W mPower reactor is rail transportable, but final onsite mPower assembly/construction became a significant undertaking, with a consequent increase in overall cost. The core unit does include a pressure vessel and heat exchange mounted above the actual reactor, but many other mPower component modules must be transported seperately and assembled on site.¶ The IIRIS project demonstrates the unlikelihood of whole small reactors being transported to the field ready for energy production without some field construction. This might be possible, however, for mini reactors that are two small to be viewed as a plausible substitute for the fossil fuel powered electrical plants currently supplying electricity for the grid. This then leaves us with¶ with a gap between the cost savings potential of factory manufacture, and the costly process of onsite assembly. B&W the manufacturers of the small 125 MW MPower reactor still has not clarified what percentage of the manufacturing process would be factory based. It is clear, however that B&W knows where it is comming from and what its problems are, as Rod Adams tells us:¶ I spoke in more detail to Chris Mowry and listened as he explained how his company's research on the history of the nuclear enterprise in the US had revealed that 30% of the material and labor cost of the existing units came from the supplied components while 70% was related to the site construction effort. He described how the preponderance of site work had influenced the cost uncertainty that has helped to discourage new nuclear plant construction for so many years.¶ What Mowey did not tell Adams is what percentage of the materials and labor costs will be shifted to the factory as mPower reactors are produced. There have been hints that a significant percentage of the mPower manufacturing process, perhaps as much as 50% will still take place on site. B&W still is working on the design of their manufacturing process, and thus do not yet know all of the details. Clearly then more work needs to be done on controlling onsite costs.¶ Finally, a shift to advanced technology will can lower manufacturing costs. Compared to Light Water reactors, Liquid metal cooled reactors use less material and perhaps less labor, but pool type liqiod metal reactors are not compact. Compared to Liquid Metal cooled reactors, Molten Salt cooled reactor will have more compact cores. Shifting to closed cycle gas turbines will decrease construction costs. The added safety of Molten Salt cooled reactors will increase reactor simplification, and thus further lower labor and materials related construction costs.¶ The recycling of old power plant locations will also offer some savings. Decreasing manufacturing time will lower interest costs. ¶ All in all there are a lot of reasons to expect lower nuclear manufacturing costs with Generation IV nuclear power plants, and at present no one has come up with a good reason for expecting Molten Salt cooled reactors to cost more than traditional NPPs. The argument, however, is not iron clad. Even if no one has pointed out plasuible errors in it, we need to introduce the caviot that expectations frenquently are not meet. It is possible, for example that the NRC might impose unreasonable expectations on molten salt cooled reactors. Demanding, for example, that they include the same safety features as LWRs, even though they do not have many LWR safety problems. But the potential savings on the cost of energy by adopting molten salt nuclear technology is substantial, and should not be ignored. ¶ To return to the problem posed by Brian Wang, the problem of lower Asian nuclear construction costs. If Europe and the United States cannot meet the Asican energy cost challenge, their economies will encounter a significant decline. Because of Labor cost advantages, it is unlikely that Generation III nuclear plants will ever cost less to build in the United States or Europe than in Asia. in order to keep the American and European economies competitive, the United States and Europe must adopt a low cost, factory manufactured nuclear technology. Molten Salt nuclear technology represents the lowest cost approach, and is highly consistent with factory manufacture and other cost lowering approaches. Couple to that the outstanding safety of molten salt nuclear technology, the potential for dramatically lowering the creation of nuclear waste, and the obsticles to nuclear proliferation posed by molten salt nuclear rechnology, and we see a real potential for keeping the American and European economies competitive, at least as far as energy costs are concerned.

#### That prevents great power wars – perception is key

**Baru 9** - Visiting Professor at the Lee Kuan Yew School of Public Policy in Singapore (Sanjaya, “Year of the power shift?,”

http://www.india-seminar.com/2009/593/593\_sanjaya\_baru.htm

**T**here is no doubt that economics alone will not determine the balance of global power, but there is no doubt either that economics has come to matter for more.¶ The management of the economy, and of the treasury, has been a vital aspect of statecraft from time immemorial. Kautilya’s *Arthashastra* says, ‘From the strength of the treasury the army is born. …men without wealth do not attain their objectives even after hundreds of trials… Only through wealth can material gains be acquired, as elephants (wild) can be captured only by elephants (tamed)… A state with depleted resources, even if acquired, becomes only a liability.’4 Hence, economic policies and performance do have strategic consequences.5¶ In the modern era, the idea that strong economic performance is the foundation of power was argued most persuasively by historian Paul Kennedy. ‘Victory (in war),’ Kennedy claimed, ‘has repeatedly gone to the side with more flourishing productive base.’6 Drawing attention to the interrelationships between economic wealth, technological innovation, and the ability of states to efficiently mobilize economic and technological resources for power projection and national defence, Kennedy argued that nations that were able to better combine military and economic strength scored over others.¶ ‘The fact remains,’ Kennedy argued, ‘that all of the major shifts in the world’s *military-power* balance have followed alterations in the *productive* balances; and further, that the rising and falling of the various empires and states in the international system has been confirmed by the outcomes of the major Great Power wars, where victory has always gone to the side with the greatest material resources.’7¶ **I**n Kennedy’s view the geopolitical consequences of an economic crisis or even decline would be transmitted through a nation’s inability to find adequate financial resources to simultaneously sustain economic growth and military power – the classic ‘guns vs butter’ dilemma.¶ Apart from such fiscal disempowerment of the state, economic under-performance would also reduce a nation’s attraction as a market, a source of capital and technology, and as a ‘knowledge power’. As power shifted from Europe to America, so did the knowledge base of the global economy. As China’s power rises, so does its profile as a ‘knowledge economy’.¶ Impressed by such arguments the China Academy of Social Sciences developed the concept of Comprehensive National Power (CNP) to get China’s political and military leadership to focus more clearly on economic and technological performance than on military power alone in its quest for Great Power status.8¶ While China’s impressive economic performance and the consequent rise in China’s global profile has forced strategic analysts to acknowledge this link, the recovery of the US economy in the 1990s had reduced the appeal of the Kennedy thesis in Washington DC. We must expect a revival of interest in Kennedy’s arguments in the current context.¶ **A** historian of power who took Kennedy seriously, Niall Ferguson, has helped keep the focus on the geopolitical implications of economic performance. In his masterly survey of the role of finance in the projection of state power, Ferguson defines the ‘square of power’ as the tax bureaucracy, the parliament, the national debt and the central bank. These four institutions of ‘fiscal empowerment’ of the state enable nations to project power by mobilizing and deploying financial resources to that end.9 ¶ Ferguson shows how vital sound economic management is to strategic policy and national power. More recently, Ferguson has been drawing a parallel between the role of debt and financial crises in the decline of the Ottoman and Soviet empires and that of the United States of America. In an early comment on the present financial crisis, Ferguson wrote:¶ ‘We are indeed living through a global shift in the balance of power very similar to that which occurred in the 1870s. This is the story of how an over-extended empire sought to cope with an external debt crisis by selling off revenue streams to foreign investors. The empire that suffered these setbacks in the 1870s was the Ottoman empire. Today it is the US… It remains to be seen how quickly today’s financial shift will be followed by a comparable geopolitical shift in favour of the new export and energy empires of the east. Suffice to say that the historical analogy does not bode well for America’s quasi-imperial network of bases and allies across the Middle East and Asia. Debtor empires sooner or later have to do more than just sell shares to satisfy their creditors*. …*as in the 1870s the balance of financial power is shifting. Then, the move was from the ancient Oriental empires (not only the Ottoman but also the Persian and Chinese) to Western Europe. Today the shift is from the US – and other western financial centres – to the autocracies of the Middle East and East Asia.’10 ¶ An economic or financial crisis may not trigger the decline of an empire. It can certainly speed up a process already underway. In the case of the Soviet Union the financial crunch caused by the Afghan war came on top of years of economic under-performance and the loss of political legitimacy of the Soviet state. In a democratic society like the United States the political legitimacy of the state is constantly renewed through periodic elections. Thus, the election of Barack Obama may serve to renew the legitimacy of the state and by doing so enable the state to undertake measures that restore health to the economy. This the Soviet state was unable to do under Gorbachev even though he repudiated the Brezhnev legacy and distanced himself from it.¶ Hence, one must not become an economic determinist and historic parallels need not always be relevant. Politics can intervene and offer solutions. Political economy and politics, in the form of Keynesian economics and the ‘New Deal’, did intervene to influence the geopolitical implications of the Great Depression. Whether they will do so once again in today’s America remains to be seen.

#### Independently key to heg

**Gelb, 10** - currently president emeritus of the Council on Foreign Relations, (Leslie, Fashioning a Realistic Strategy for the Twenty-First Century,” Fletcher Forum of World Affairs vol.34:2 summer 2010 http://fletcher.tufts.edu/forum/archives/pdfs/34-2pdfs/Gelb.pdf)

**LESLIE H. GELB:** Power is what it always has been. It is the ability to get someone to do something they do not want to do by means of your resources and your position. It was always that. There is no such thing in my mind as “soft” power or “hard” power or “smart” power or “dumb” power. It is people who are hard or soft or smart or dumb. Power is power. And people use it wisely or poorly. Now, what has changed is the composition of power in international affairs. For almost all of history, international power was achieved in the form of military power and military force. Now, particularly in the last fifty years or so, it has become more and more economic. So power consists of economic power, military power, and diplomatic power, but the emphasis has shifted from military power (for almost all of history) to now, more economic power. And, as President Obama said in his West Point speech several months ago, our economy is the basis of our international power in general and our military power in particular. That is where it all comes from. Whether other states listen to us and act on what we say depends a good deal on their perception of the strength of the American economy. A big problem for us in the last few years has been the perception that our economy is in decline.

#### Heg solves extinction

**Barnett 2011** – Former Senior Strategic Researcher and Professor in the Warfare Analysis & Research Department, Center for Naval Warfare Studies, U.S. Naval War College, worked as the Assistant for Strategic Futures in the Office of Force Transformation in the DOD (3/7, Thomas, World Politics Review, “The New Rules: Leadership Fatigue Puts U.S., and Globalization, at Crossroads”, <http://www.worldpoliticsreview.com/articles/8099/the-new-rules-leadership-fatigue-puts-u-s-and-globalization-at-crossroads>, credit to LDK)

Events in Libya are a further reminder for Americans that we stand at a crossroads in our continuing evolution as the world's sole full-service superpower. Unfortunately, we are increasingly seeking change without cost, and shirking from risk because we are tired of the responsibility. We don't know who we are anymore, and our president is a big part of that problem. Instead of leading us, he explains to us. Barack Obama would have us believe that he is practicing strategic patience. But many experts and ordinary citizens alike have concluded that he is actually beset by strategic incoherence -- in effect, a man overmatched by the job.  It is worth first examining the larger picture: We live in a time of arguably the greatest structural change in the global order yet endured, with this historical moment's most amazing feature being its relative and absolute lack of mass violence. That is something to consider when Americans contemplate military intervention in Libya, because if we do take the step to prevent larger-scale killing by engaging in some killing of our own, we will not be adding to some fantastically imagined global death count stemming from the ongoing "megalomania" and "evil" of American "empire." We'll be engaging in the same sort of system-administering activity that has marked our stunningly successful stewardship of global order since World War II.  Let me be more blunt: As the guardian of globalization, the U.S. military has been the greatest force for peace the world has ever known. Had America been removed from the global dynamics that governed the 20th century, the mass murder never would have ended. Indeed, it's entirely conceivable there would now be no identifiable human civilization left, once nuclear weapons entered the killing equation.  But the world did not keep sliding down that path of perpetual war. Instead, America stepped up and changed everything by ushering in our now-perpetual great-power peace. We introduced the international liberal trade order known as globalization and played loyal Leviathan over its spread. What resulted was the collapse of empires, an explosion of democracy, the persistent spread of human rights, the liberation of women, the doubling of life expectancy, a roughly 10-fold increase in adjusted global GDP and a profound and persistent reduction in battle deaths from state-based conflicts.

### Warming adv

#### Warming is real and anthropogenic – carbon dioxide increase, polar ice records, melting glaciers, sea level rise

**Prothero 12** [Donald R. Prothero, Professor of Geology at Occidental College and Lecturer in Geobiology at the California Institute of Technology, 3-1-2012, "How We Know Global Warming is Real and Human Caused," Skeptic, vol 17 no 2, EBSCO]

Converging Lines of Evidence¶ How do we know that global warming is real and primarily human caused? There are numerous lines of evidence that converge toward this conclusion.¶ 1. Carbon Dioxide Increase.¶ Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Little Ice Age in die 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, die timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil.¶ 2. Melting Polar Ice Caps.¶ The polar icecaps are thinning and breaking up at an alarming rate. In 2000, my former graduate advisor Malcolm McKenna was one of the first humans to fly over the North Pole in summer time and see no ice, just open water. The Arctic ice cap has been frozen solid for at least the past 3 million years (and maybe longer),4 but now the entire ice sheet is breaking up so fast that by 2030 (and possibly sooner) less than half of the Arctic will be ice covered in the summer.5 As one can see from watching the news, this is an ecological disaster for everything that lives up there, from the polar bears to the seals and walruses to the animals they feed upon, to the 4 million people whose world is melting beneath their feet. The Antarctic is thawing even faster. In February-March 2002, the Larsen B ice shelf - over 3000 square km (the size of Rhode Island) and 220 m (700 feet) thick- broke up in just a few months, a story typical of nearly all the ice shelves in Antarctica. The Larsen B shelf had survived all the previous ice ages and interglacial warming episodes over the past 3 million years, and even the warmest periods of the last 10,000 years- yet it and nearly all the other thick ice sheets on the Arctic, Greenland, and Antarctic are vanishing at a rate never before seen in geologic history.¶ 3. Melting Glaciers.¶ Glaciers are all retreating at the highest rates ever documented. Many of those glaciers, along with snow melt, especially in the Himalayas, Andes, Alps, and Sierras, provide most of the freshwater that the populations below the mountains depend upon - yet this fresh water supply is vanishing. Just think about the percentage of world's population in southern Asia (especially India) that depend on Himalayan snowmelt for their fresh water. The implications are staggering. The permafrost that once remained solidly frozen even in the summer has now Üiawed, damaging the Inuit villages on the Arctic coast and threatening all our pipelines to die North Slope of Alaska. This is catastrophic not only for life on the permafrost, but as it thaws, the permafrost releases huge amounts of greenhouse gases which are one of the major contributors to global warming. Not only is the ice vanishing, but we have seen record heat waves over and over again, killing thousands of people, as each year joins the list of the hottest years on record. (2010 just topped that list as the hottest year, surpassing the previous record in 2009, and we shall know about 2011 soon enough). Natural animal and plant populations are being devastated all over the globe as their environments change.6 Many animals respond by moving their ranges to formerly cold climates, so now places that once did not have to worry about disease-bearing mosquitoes are infested as the climate warms and allows them to breed further north.¶ 4. Sea Level Rise.¶ All that melted ice eventually ends up in the ocean, causing sea levels to rise, as it has many times in the geologic past. At present, the sea level is rising about 3-4 mm per year, more than ten times the rate of 0.10.2 mm/year that has occurred over the past 3000 years. Geological data show Üiat ttie sea level was virtually unchanged over the past 10,000 years since the present interglacial began. A few mm here or there doesn't impress people, until you consider that the rate is accelerating and that most scientists predict sea levels will rise 80-130 cm in just the next century. A sea level rise of 1.3 m (almost 4 feet) would drown many of the world's low-elevation cities, such as Venice and New Orleans, and low-lying countries such as the Netherlands or Bangladesh. A number of tiny island nations such as Vanuatu and the Maldives, which barely poke out above the ocean now, are already vanishing beneath the waves. Eventually their entire population will have to move someplace else.7 Even a small sea level rise might not drown all these areas, but they are much more vulnerable to the large waves of a storm surge (as happened with Hurricane Katrina), which could do much more damage than sea level rise alone. If sea level rose by 6 m (20 feet), most of die world's coastal plains and low-lying areas (such as the Louisiana bayous, Florida, and most of the world's river deltas) would be drowned.¶ Most of the world's population lives in lowelevation coastal cities such as New York, Boston, Philadelphia, Baltimore, Washington, D.C., Miami, and Shanghai. All of those cities would be partially or completely under water with such a sea level rise. If all the glacial ice caps melted completely (as they have several times before during past greenhouse episodes in the geologic past), sea level would rise by 65 m (215 feet)! The entire Mississippi Valley would flood, so you could dock an ocean liner in Cairo, Illinois. Such a sea level rise would drown nearly every coastal region under hundreds of feet of water, and inundate New York City, London and Paris. All that would remain would be the tall landmarks such as the Empire State Building, Big Ben, and the Eiffel Tower. You could tie your boats to these pinnacles, but the rest of these drowned cities would lie deep underwater.

#### Worst-case warming results in extinction

Ahmed 2010 (Nafeez Ahmed, Executive Director of the Institute for Policy Research and Development, professor of International Relations and globalization at Brunel University and the University of Sussex, Spring/Summer 2010, “Globalizing Insecurity: The Convergence of Interdependent Ecological, Energy, and Economic Crises,” Spotlight on Security, Volume 5, Issue 2, online)

Perhaps the most notorious indicator is anthropogenic global warmings warming. The landmark 2007 Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change (IPCC) – which warned that at then-current rates of increase of fossil fuel emissions, the earth’s global average temperature would likely rise by 6°C by the end of the 21st century creating a largely uninhabitable planet – was a wake-up call to the international community.[v] Despite the pretensions of ‘climate sceptics,’ the peer-reviewed scientific literature has continued to produce evidence that the IPCC’s original scenarios were wrong – not because they were too alarmist, but on the contrary, because they were far too conservative. According to a paper in the Proceedings of the National Academy of Sciences, current CO2 emissions are worse than all six scenarios contemplated by the IPCC. This implies that the IPCC’s worst-case six-degree scenario severely underestimates the most probable climate trajectory under current rates of emissions.[vi] It is often presumed that a 2°C rise in global average temperatures under an atmospheric concentration of greenhouse gasses at 400 parts per million (ppm) constitutes a safe upper limit – beyond which further global warming could trigger rapid and abrupt climate changes that, in turn, could tip the whole earth climate system into a process of irreversible, runaway warming.[vii] Unfortunately, we are already well past this limit, with the level of greenhouse gasses as of mid-2005 constituting 445 ppm.[viii] Worse still, cutting-edge scientific data suggests that the safe upper limit is in fact far lower. James Hansen, director of the NASA Goddard Institute for Space Studies, argues that the absolute upper limit for CO2 emissions is 350 ppm: “If the present overshoot of this target CO2 is not brief, there is a possibility of seeding irreversible catastrophic effects.”[ix] A wealth of scientific studies has attempted to explore the role of positive-feedback mechanisms between different climate sub-systems, the operation of which could intensify the warming process. Emissions beyond 350 ppm over decades are likely to lead to the total loss of Arctic sea-ice in the summer triggering magnified absorption of sun radiation, accelerating warming; the melting of Arctic permafrost triggering massive methane injections into the atmosphere, accelerating warming; the loss of half the Amazon rainforest triggering the momentous release of billions of tonnes of stored carbon, accelerating warming; and increased microbial activity in the earth’s soil leading to further huge releases of stored carbon, accelerating warming; to name just a few. Each of these feedback sub-systems alone is sufficient by itself to lead to irreversible, catastrophic effects that could tip the whole earth climate system over the edge.[x] Recent studies now estimate that the continuation of business-as-usual would lead to global warming of three to four degrees Celsius before 2060 with multiple irreversible, catastrophic impacts; and six, even as high as eight, degrees by the end of the century – a situation endangering the survival of all life on earth.[xi]

#### Warming causes ocean acidification and collapse – extinction

**Sify 2010 –** Sydney newspaper citing Ove Hoegh-Guldberg, professor at University of Queensland and Director of the Global Change Institute, and John Bruno, associate professor of Marine Science at UNC (Sify News, “Could unbridled climate changes lead to human extinction?”, <http://www.sify.com/news/could-unbridled-climate-changes-lead-to-human-extinction-news-international-kgtrOhdaahc.html>, WEA)

The findings of the comprehensive report: 'The impact of climate change on the world's marine ecosystems' emerged from a synthesis of recent research on the world's oceans, carried out by two of the world's leading marine scientists. One of the authors of the report is Ove Hoegh-Guldberg, professor at The University of Queensland and the director of its Global Change Institute (GCI). 'We may see sudden, unexpected changes that have serious ramifications for the overall well-being of humans, including the capacity of the planet to support people. This is further evidence that we are well on the way to the next great extinction event,' says Hoegh-Guldberg. 'The findings have enormous implications for mankind, particularly if the trend continues. The earth's ocean, which produces half of the oxygen we breathe and absorbs 30 per cent of human-generated carbon dioxide, is equivalent to its heart and lungs. This study shows worrying signs of ill-health. It's as if the earth has been smoking two packs of cigarettes a day!,' he added. 'We are entering a period in which the ocean services upon which humanity depends are undergoing massive change and in some cases beginning to fail', he added. The 'fundamental and comprehensive' changes to marine life identified in the report include rapidly warming and acidifying oceans, changes in water circulation and expansion of dead zones within the ocean depths. These are driving major changes in marine ecosystems: less abundant coral reefs, sea grasses and mangroves (important fish nurseries); fewer, smaller fish; a breakdown in food chains; changes in the distribution of marine life; and more frequent diseases and pests among marine organisms. Study co-author John F Bruno, associate professor in marine science at The University of North Carolina, says greenhouse gas emissions are modifying many physical and geochemical aspects of the planet's oceans, in ways 'unprecedented in nearly a million years'. 'This is causing fundamental and comprehensive changes to the way marine ecosystems function,' Bruno warned, according to a GCI release. These findings were published in Science

#### The IFR is the only way to reduce coal emissions sufficiently to avert the worst climate disasters

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "Why We Should Build an Integral Fast Reactor Now," 11/25/9) http://skirsch.wordpress.com/2009/11/25/ifr/

To prevent a climate disaster, we must eliminate virtually all coal plant emissions worldwide in 25 years. The best way and, for all practical purposes, the only way to get all countries off of coal is not with coercion; it is to make them want to replace their coal burners by giving them a plug-compatible technology that is less expensive. The IFR can do this. It is plug-compatible with the burners in a coal plant (see Nuclear Power: Going Fast). No other technology can upgrade a coal plant so it is greenhouse gas free while reducing operating costs at the same time. In fact, no other technology can achieve either of these goals. The IFR can achieve both.¶ The bottom line is that without the IFR (or a yet-to-be-invented technology with similar ability to replace the coal burner with a cheaper alternative), it is unlikely that we’ll be able to keep CO2 under 450 ppm.¶ Today, the IFR is the only technology with the potential to displace the coal burner. That is why restarting the IFR is so critical and why Jim Hansen has listed it as one of the top five things we must do to avert a climate disaster.[4]¶ Without eliminating virtually all coal emissions by 2030, the sum total of all of our other climate mitigation efforts will be inconsequential. Hansen often refers to the near complete phase-out of carbon emissions from coal plants worldwide by 2030 as the sine qua non for climate stabilization (see for example, the top of page 6 in his August 4, 2008 trip report).¶ To stay under 450ppm, we would have to install about 13,000 GWe of new carbon-free power over the next 25 years. That number was calculated by Nathan Lewis of Caltech for the Atlantic, but others such as Saul Griffith have independently derived a very similar number and White House Science Advisor John Holdren used 5,600 GWe to 7,200 GWe in his presentation to the Energy Bar Association Annual Meeting on April 23, 2009. That means that if we want to save the planet, we must install more than 1 GWe per day of clean power every single day for the next 25 years. That is a very, very tough goal. It is equivalent to building one large nuclear reactor per day, or 1,500 huge wind turbines per day, or 80,000 37 foot diameter solar dishes covering 100 square miles every day, or some linear combination of these or other carbon free power generation technologies. Note that the required rate is actually higher than this because Hansen and Rajendra Pachauri, the chair of the IPCC, now both agree that 350ppm is a more realistic “not to exceed” number (and we’ve already exceeded it).¶ Today, we are nowhere close to that installation rate with renewables alone. For example, in 2008, the average power delivered by solar worldwide was only 2 GWe (which is to be distinguished from the peak solar capacity of 13.4GWe). That is why every renewable expert at the 2009 Aspen Institute Environment Forum agreed that nuclear must be part of the solution. Al Gore also acknowledges that nuclear must play an important role.¶ Nuclear has always been the world’s largest source of carbon free power. In the US, for example, even though we haven’t built a new nuclear plant in the US for 30 years, nuclear still supplies 70% of our clean power!¶ Nuclear can be installed very rapidly; much more rapidly than renewables. For example, about two thirds of the currently operating 440 reactors around the world came online during a 10 year period between 1980 and 1990. So our best chance of meeting the required installation of new power goal and saving the planet is with an aggressive nuclear program.¶ Unlike renewables, nuclear generates base load power, reliably, regardless of weather. Nuclear also uses very little land area. It does not require the installation of new power lines since it can be installed where the power is needed. However, even with a very aggressive plan involving nuclear, it will still be extremely difficult to install clean power fast enough.¶ Unfortunately, even in the US, we have no plan to install the clean power we need fast enough to save the planet. Even if every country were to agree tomorrow to completely eliminate their coal plant emissions by 2030, how do we think they are actually going to achieve that? There is no White House plan that explains this. There is no DOE plan. There is no plan or strategy. The deadlines will come and go and most countries will profusely apologize for not meeting their goals, just like we have with most of the signers of the Kyoto Protocol today. Apologies are nice, but they will not restore the environment.¶ We need a strategy that is believable, practical, and affordable for countries to adopt. The IFR offers our best hope of being a centerpiece in such a strategy because it the only technology we know of that can provide an economically compelling reason to change.¶ At a speech at MIT on October 23, 2009, President Obama said “And that’s why the world is now engaged in a peaceful competition to determine the technologies that will power the 21st century. … The nation that wins this competition will be the nation that leads the global economy. I am convinced of that. And I want America to be that nation, it’s that simple.”¶ Nuclear is our best clean power technology and the IFR is our best nuclear technology. The Gen IV International Forum (GIF) did a study in 2001-2002 of 19 different reactor designs on 15 different criteria and 24 metrics. The IFR ranked #1 overall. Over 242 experts from around the world participated in the study. It was the most comprehensive evaluation of competitive nuclear designs ever done. Top DOE nuclear management ignored the study because it didn’t endorse the design the Bush administration wanted.¶ The IFR has been sitting on the shelf for 15 years and the DOE currently has no plans to change that.¶ How does the US expect to be a leader in clean energy by ignoring our best nuclear technology? Nobody I’ve talked to has been able to answer that question.¶ We have the technology (it was running for 30 years before we were ordered to tear it down). And we have the money: The Recovery Act has $80 billion dollars. Why aren’t we building a demo plant?¶ IFRs are better than conventional nuclear in every dimension. Here are a few:¶ Efficiency: IFRs are over 100 times more efficient than conventional nuclear. It extracts nearly 100% of the energy from nuclear material. Today’s nuclear reactors extract less than 1%. So you need only 1 ton of actinides each year to feed an IFR (we can use existing nuclear waste for this), whereas you need 100 tons of freshly mined uranium each year to extract enough material to feed a conventional nuclear plant.¶ Unlimited power forever: IFRs can use virtually any actinide for fuel. Fast reactors with reprocessing are so efficient that even if we restrict ourselves to just our existing uranium resources, we can power the entire planet forever (the Sun will consume the Earth before we run out of material to fuel fast reactors). If we limited ourselves to using just our DU “waste” currently in storage, then using the IFR we can power the US for over 1,500 years without doing any new mining of uranium.[5]¶ Exploits our largest energy resource: In the US, there is 10 times as much energy in the depleted uranium (DU) that is just sitting there as there is coal in the ground. This DU waste is our largest natural energy resource…but only if we have fast reactors. Otherwise, it is just waste. With fast reactors, virtually all our nuclear waste (from nuclear power plants, leftover from enrichment, and from decommissioned nuclear weapons)[6] becomes an energy asset worth about $30 trillion dollars…that’s not a typo…$30 trillion, not billion.[7] An 11 year old child was able to determine this from publicly available information in 2004.

#### Inventing something cheaper is key – alternative methods can’t solve warming

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "How Does Obama Expect to Solve the Climate Crisis Without a Plan?" 7/16/9) [http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html-http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html](http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html-http%3A//www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html)

The ship is sinking slowly and we are quickly running out of time to develop and implement any such plan if we are to have any hope of saving the planet. What we need is a plan we can all believe in. A plan where our country's smartest people all nod their heads in agreement and say, "Yes, this is a solid, viable plan for keeping CO2 levels from touching 425ppm and averting a global climate catastrophe."¶ ¶ At his Senate testimony a few days ago, noted climate scientist James Hansen made it crystal clear once again that the only way to avert an irreversible climate meltdown and save the planet is to phase out virtually all coal plants worldwide over a 20 year period from 2010 to 2030. Indeed, if we don't virtually eliminate the use of coal worldwide, everything else we do will be as effective as re-arranging deck chairs on the Titanic.¶ ¶ Plans that won't work¶ ¶ Unfortunately, nobody has proposed a realistic and practical plan to eliminate coal use worldwide or anywhere close to that. There is no White House URL with such a plan. No environmental group has a workable plan either.¶ ¶ Hoping that everyone will abandon their coal plants and replace them with a renewable power mix isn't a viable strategy -- we've proven that in the U.S. Heck, even if the Waxman-Markey bill passes Congress (a big "if"), it is so weak that it won't do much at all to eliminate coal plants. So even though we have Democrats controlling all three branches of government, it is almost impossible to get even a weak climate bill passed.¶ ¶ If we can't pass strong climate legislation in the U.S. with all the stars aligned, how can we expect anyone else to do it? So expecting all countries to pass a 100% renewable portfolio standard (which is far far beyond that contemplated in the current energy bill) just isn't possible. Secondly, even if you could mandate it politically in every country, from a practical standpoint, you'd never be able to implement it in time. And there are lots of experts in this country, including Secretary Chu, who say it's impossible without nuclear (a point which I am strongly in agreement with).¶ ¶ Hoping that everyone will spontaneously adopt carbon capture and sequestration (CCS) is also a non-starter solution. First of all, CCS doesn't exist at commercial scale. Secondly, even if we could make it work at scale, and even it could be magically retrofitted on every coal plant (which we don't know how to do), it would require all countries to agree to add about 30% in extra cost for no perceivable benefit. At the recent G8 conference, India and China have made it clear yet again that they aren't going to agree to emission goals.¶ ¶ Saying that we'll invent some magical new technology that will rescue us at the last minute is a bad solution. That's at best a poor contingency plan.¶ ¶ The point is this: It should be apparent to us that we aren't going to be able to solve the climate crisis by either "force" (economic coercion or legislation) or by international agreement. And relying on technologies like CCS that may never work is a really bad idea.¶ ¶ The only remaining way to solve the crisis is to make it economically irresistible for countries to "do the right thing." The best way to do that is to give the world a way to generate electric power that is economically more attractive than coal with the same benefits as coal (compact power plants, 24x7 generation, can be sited almost anywhere, etc). Even better is if the new technology can simply replace the existing burner in a coal plant. That way, they'll want to switch. No coercion is required.

#### IFRs solve massive energy and overpopulation crunches that spark resource wars and water scarcity – no alternatives can solve

**Blees et al 11** (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/

The global threat of anthropogenic climate change has become a political hot potato, especially in the USA. The vast majority of climate scientists, however, are in agreement that the potential consequences of inaction are dire indeed. Yet even those who dismiss concerns about climate change cannot discount an array of global challenges facing humanity that absolutely must be solved if wars, dislocations, and social chaos are to be avoided.¶ Human population growth exacerbates a wide range of problems, and with most demographic projections predicting an increase of about 50% to nine or ten billion by mid-century, we are confronted with a social and logistical dilemma of staggering proportions. The most basic human morality dictates that we attempt to solve these problems without resorting to forcible and draconian methods. At the same time, simple social justice demands that the developed world accept the premise that the billions who live today in poverty deserve a drastic improvement in their standard of living, an improvement that is being increasingly demanded and expected throughout the developing countries. To achieve environmental sustainability whilst supporting human well-being will require a global revolution in energy and materials technology and deployment fully as transformative as the Industrial Revolution, but unlike that gradual process we find ourselves under the gun, especially if one considers climate change, peak oil and other immediate sustainability problems to be bona fide threats.¶ It is beyond the purview of this paper to address the question of materials disposition and recycling [i], or the social transformations that will necessarily be involved in confronting the challenges of the next several decades. But the question of energy supply is inextricably bound up with the global solution to our coming crises. It may be argued that energy is the most crucial aspect of any proposed remedy. Our purpose here is to demonstrate that the provision of all the energy that humankind can possibly require to meet the challenges of the coming decades and centuries is a challenge that already has a realistic solution, using technology that is just waiting to be deployed.¶ Energy Realism¶ The purpose of this paper is not to exhaustively examine the many varieties of energy systems currently in use, in development, or in the dreams of their promoters. Nevertheless, because of the apparent passion of both the public and policymakers toward certain energy systems and the political influence of their advocates, a brief discussion of “renewable” energy systems is in order. Our pressing challenges make the prospect of heading down potential energy cul de sacs – especially to the explicit exclusion of nuclear fission alternatives – to be an unconscionable waste of our limited time and resources.¶ There is a vocal contingent of self-styled environmentalists who maintain that wind and solar power—along with other technologies such as wave and tidal power that have yet to be meaningfully developed—can (and should) provide all the energy that humanity demands. The more prominent names are well-known among those who deal with these issues: Amory Lovins, Lester Brown and Arjun Makhijani are three in particular whose organizations wield considerable clout with policymakers. The most recent egregious example to make a public splash, however, was a claim trumpeted with a cover story in Scientific American that all of our energy needs can be met by renewables (predominantly ‘technosolar’ – wind and solar thermal) by 2030. The authors of this piece—Mark Jacobson (Professor, Stanford) and Mark A. Delucchi (researcher, UC Davis)—were roundly critiqued [ii] online and in print.¶ An excellent treatment of the question of renewables’ alleged capacity to provide sufficient energy is a book by David MacKay [iii] called Sustainable Energy – Without the Hot Air. [iv] MacKay was a professor of physics at Cambridge before being appointed Chief Scientific Advisor to the Department of Energy and Climate Change in the UK. His book is a model of scientific and intellectual rigor.¶ Energy ideologies can be every bit as fervent as those of religion, so after suggesting Dr. MacKay’s book as an excellent starting point for a rational discussion of energy systems we’ll leave this necessary digression with a point to ponder. Whatever one believes about the causes of climate change, there is no denying that glaciers around the world are receding at an alarming rate. Billions of people depend on such glaciers for their water supplies. We have already seen cases of civil strife and even warfare caused or exacerbated by competition over water supplies. Yet these are trifling spats when one considers that the approaching demographic avalanche will require us to supply about three billion more people with all the water they need within just four decades.¶ There is no avoiding the fact that the water for all these people—and even more, if the glaciers continue to recede, as expected—will have to come from the ocean. That means a deployment of desalination facilities on an almost unimaginable scale. Not only will it take staggering amounts of energy just to desalinate such a quantity, but moving the water to where it is needed will be an additional energy burden of prodigious proportions. A graphic example can be seen in the case of California, its state water project being the largest single user of energy in California. It consumes an average of 5 billion kWh/yr, more than 25% of the total electricity consumption of the entire state of New Mexico [v].¶ Disposing of the salt derived from such gargantuan desalination enterprises will likewise take a vast amount of energy. Even the relatively modest desalination projects along the shores of the Persian Gulf have increased its salinity to the point of serious concern. Such circumscribed bodies of water simply won’t be available as dumping grounds for the mountains of salt that will be generated, and disposing of it elsewhere will require even more energy to move and disperse it. Given the formidable energy requirements for these water demands alone, any illusions about wind turbines and solar panels being able to supply all the energy humanity requires should be put to rest.¶ Energy Density and Reliability¶ Two of the most important qualities of fossil fuels that enabled their rise to prominence in an industrializing world is their energy density and ease of storage. High energy density and a stable and convenient long-term fuel store are qualities that makes it practical and economical to collect, distribute, and then use them on demand for the myriad of uses to which we put them. This energy density, and the dispatchability that comes from having a non-intermittent fuel source, are the very things lacking in wind and solar and other renewable energy systems, yet they are crucial factors in considering how we can provide reliable on-demand power for human society.¶ The supply of fossil fuels is limited, although the actual limits of each different type are a matter of debate and sometimes change substantially with new technological developments, as we’ve seen recently with the adoption of hydraulic fracturing (fracking) methods to extract natural gas from previously untapped subterranean reservoirs. The competition for fossil fuel resources, whatever their limitations, has been one of the primary causes of wars in the past few decades and can be expected to engender further conflicts and other symptoms of international competition as countries like India and China lead the developing nations in seeking a rising standard of living for their citizens. Even disregarding the climatological imperative to abandon fossil fuels, the economic, social, and geopolitical upheavals attendant upon a continuing reliance on such energy sources demands an objective look at the only other energy-dense and proven resource available to us: nuclear power.¶ We will refrain from discussing the much hoped-for chimera of nuclear fusion as the magic solution to all our energy needs, since it is but one of many technologies that have yet to be harnessed. Our concern here is with technologies that we know will work, so when it comes to harnessing the power of the atom we are confined to nuclear fission. The splitting of uranium and transuranic elements in fission-powered nuclear reactors is a potent example of energy density being tapped for human uses. Reactor-grade uranium (i.e. uranium enriched to about 3.5% U-235) is over 100,000 times more energy-dense than anthracite coal, the purest form of coal used in power generation, and nearly a quarter-million times as much as lignite, the dirty coal used in many power plants around the world. Ironically, one of the world’s largest producers and users of lignite is Germany, the same country whose anti-nuclear political pressure under the banner of environmentalism is globally infamous.¶ The vast majority of the world’s 440 commercial nuclear power plants are light-water reactors (LWRs) that use so-called enriched uranium (mentioned above). Natural uranium is comprised primarily of two isotopes: U-235 and U-238. The former comprises only 0.7% of natural uranium, with U-238 accounting for the remaining 99.3%. LWR technology requires a concentration of at least 3.5% U-235 in order to maintain the chain reaction used to extract energy, so a process called uranium enrichment extracts as much of the U-235 as possible from several kilos of natural uranium and adds it to a fuel kilo in order to reach a concentration high enough to enable the fission process. Because current enrichment technology is capable of harvesting only some of the U-235, this results in about 8-10 kilos of “depleted uranium” (DU) for every kilo of power plant fuel (some of which is enriched to 4% or more, depending on plant design). The USA currently has (largely unwanted) stockpiles of DU in excess of half a million tons, while other countries around the world that have been employing nuclear power over the last half-century have their own DU inventories.¶ Technological advances in LWR engineering have resulted in new power plants that are designated within the industry as Generation III or III+ designs, to differentiate them from currently-used LWRs normally referred to as Gen II plants. The European Pressurized Reactor (EPR), currently being built by AREVA in Finland, France and China, is an example of a Gen III design. It utilizes multiple-redundant engineered systems to assure safety and dependability. Two examples of Gen III+ designs are the Westinghouse/Toshiba AP-1000, now being built in China, and GE/Hitachi’s Economic Simplified Boiling Water Reactor (ESBWR), expected to be certified for commercial use by the U.S. Nuclear Regulatory Commission by the end of 2011. The distinguishing feature of Gen III+ designs is their reliance on the principle of passive safety, which would allow the reactor to automatically shut down in the event of an emergency without operator action or electronic feedback, due to inherent design properties. Relying as they do on the laws of physics rather than active intervention to intercede, they consequently can avoid the necessity for several layers of redundant systems while still maintaining ‘defense in depth’, making it possible to build them both faster and cheaper than Gen III designs—at least in theory. As of this writing we are seeing this playing out in Finland and China. While it is expected that first-of-a-kind difficulties (and their attendant costs) will be worked out so that future plants will be cheaper and faster to build, the experience to date seems to validate the Gen III+ concept. Within a few years both the EPR and the first AP-1000s should be coming online, as well as Korean, Russian and Indian designs, at which point actual experience will begin to tell the tale as subsequent plants are built.¶ The safety and economics of Gen III+ plants seem to be attractive enough to consider this generation of nuclear power to provide reasons for optimism that humanity can manage to provide the energy needed for the future. But naysayers are warning (with highly questionable veracity) about uranium shortages if too many such plants are built. Even if they’re right, the issue can be considered moot, for there is another player waiting in the wings that is so superior to even Gen III+ technology as to render all concerns about nuclear fuel shortages baseless.¶ The Silver Bullet¶ In the endless debate on energy policy and technology that seems to increase by the day, the phrase heard repeatedly is “There is no silver bullet.” (This is sometimes rendered “There is no magic bullet”, presumably by those too young to remember the Lone Ranger TV series.) Yet a fission technology known as the integral fast reactor (IFR), developed at Argonne National Laboratory in the 80s and 90s, gives the lie to that claim.¶ Below is a graph [vi] representing the number of years that each of several power sources would be able to supply all the world’s expected needs if they were to be relied upon as the sole source of humanity’s energy supply. The categories are described thusly:¶ Conventional oil: ordinary oil drilling and extraction as practiced today¶ Conventional gas: likewise¶ Unconventional oil (excluding low-grade oil shale). More expensive methods of recovering oil from more problematic types of deposits¶ Unconventional gas (excluding clathrates and geopressured gas): As with unconventional oil, this encompasses more costly extraction techniques¶ Coal: extracted with techniques in use today. The worldwide coal estimates, however, are open to question and may, in fact, be considerably less than they are ordinarily presented to be, unless unconventional methods like underground in situ gasification are deployed. [vii]¶ Methane Clathrates & Geopressured Gas: These are methane resources that are both problematic and expensive to recover, with the extraction technology for clathrates only in the experimental stage.¶ Low-grade oil shale and sands: Very expensive to extract and horrendously destructive of the environment. So energy-intensive that there have been proposals to site nuclear power plants in the oil shale and tar sands areas to provide the energy for extraction!¶ Uranium in fast breeder reactors (IFRs being the type under discussion here) Integral fast reactors can clearly be seen as the silver bullet that supposedly doesn’t exist. The fact is that IFRs can provide all the energy that humanity requires, and can deliver it cleanly, safely, and economically. This technology is a true game changer.

#### Resource scarcity causes global wars – highly probable

**Klare 2006** – professor of peace and world security studies at Hampshire College

(Michael, Mar 6 2006, “The coming resource wars” http://www.energybulletin.net/node/13605)

It's official: the era of resource wars is upon us. In a major London address, British Defense Secretary John Reid warned that global climate change and **dwindling natural resources are combining to increase the likelihood of violent conflict** over land, water and energy. Climate change, he indicated, “will make scarce resources, clean water, viable agricultural land even scarcer”—and this will “make the emergence of violent conflict more rather than less likely.” Although not unprecedented, Reid’s prediction of an upsurge in resource conflict is significant both because of his senior rank and the vehemence of his remarks. “The blunt truth is that the lack of water and agricultural land is a significant contributory factor to the tragic conflict we see unfolding in Darfur,” he declared. “We should see this as a warning sign.” Resource conflicts of this type are most likely to arise in the developing world, Reid indicated, but the more advanced and affluent countries are not likely to be spared the damaging and destabilizing effects of global climate change. With sea levels rising, water and energy becoming increasingly scarce and prime agricultural lands turning into deserts, internecine warfare over access to vital resources will become a global phenomenon. Reid’s speech, delivered at the prestigious Chatham House in London (Britain’s equivalent of the Council on Foreign Relations), is but the most recent expression of a growing trend in strategic circles to view environmental and resource effects—rather than political orientation and ideology—as the most potent source of armed conflict in the decades to come. With the world population rising, global consumption rates soaring, energy supplies rapidly disappearing and climate change eradicating valuable farmland, the stage is being set for persistent and worldwide struggles over vital resources. Religious and political strife will not disappear in this scenario, but rather will be channeled into contests over valuable sources of water, food and energy.

#### Water scarcity causes extinction

**Coddrington 10** (7/1, http://www.tomorrowtoday.co.za/2010/07/01/a-looming-crisis-world-water-wars/

PhD-Business Adminstration & Guest lecturer at top business schools, including the London Business School, Duke Corporate Education and the Gordon Institute of Business Science.)

People go to war when their way of life is threatened. I have written before about the many issues we face in the coming years that threaten our way of life. These include global warming/climate change, pollution, pandemics, nuclear bombs, intelligent machines, genetics, and more. More and more I am becoming convinced that the next major regional/global conflict will be over water. We are much more likely to have water wars in the next decade than nuclear ones. And I were to guess, I’d say that it is most likely to happen in around North East Africa. This is a region with its own internal issues. But it also has the foreign involvement of America, China, the Middle Eastern Arab nations, and (increasingly) Israel. Quite a potent mix… Last week, Addis Ababa, Ethiopia hosted the 18th regular meeting of the Council of Ministers of Water Affairs of the Nile Basin countries. In the lead up to the conference, Ethiopia, Rwanda, Uganda, Tanzania and Kenya, the five countries that are all upstream of Egypt and Sudan concluded a water-sharing treaty – to the exclusion of Egypt and Sudan. This has obviously reignited the longstanding dispute over water distribution of the world’s longest river in the world’s driest continent. Egypt is currently the largest consumer of Nile water and is the main beneficiary of a 1929 treaty which allows it to take 55.5 billion cubic metres of water each year, or 87% of the White and Blue Nile’s flow. By contrast, Sudan is only allowed to draw 18.5 billion cubic metres. On attaining independence Sudan refused to acknowledge the validity of the Nile water treaty and negotiated a new bilateral treaty with Egypt in 1959. Kenya, Tanzania and Uganda also expressly refused to be bound by the treaty when they attained independence, but have not negotiated a new treaty since then. Under the 1929 treaty, Egypt has powers over upstream projects: The Nile Waters Agreement of 1929 states that no country in the Nile basin should undertake any works on the Nile, or its tributaries, without Egypt’s express permission. This gives Egypt a veto over anything, including the building of dams on numerous rivers in Kenya, Burundi, Rwanda, Tanzania, Ethiopia, and by implication Egypt has control over agriculture, industry and infrastructure and basic services such as drinking water and electricity in these countries. This is surely untenable. But if the other countries broke the treaty, would Egypt respond with force? Since the late 1990s, Nile Basin states have been trying unsuccessfully to develop a revised framework agreement for water sharing, dubbed the Nile Basin Initiative (NBI). In May 2009, talks held in Kinshasa broke down because Egypt and Sudan’s historical water quotas were not mentioned in the text of the proposed agreement. Water ministers met again in July 2009 in Alexandria, where Egypt and Sudan reiterated their rejection of any agreement that did not clearly establish their historical share of water. This is an untenable position. Upstream states accuse Egypt and Sudan of attempting to maintain an unfair, colonial-era monopoly on the river. Egyptian officials and analysts, however, defend their position, pointing out that Egypt is much more dependent on the river for its water needs than its upstream neighbours. Egypt claims that Nile water accounts for more than 95% of Egypt’s total water consumption, although they appear to be working hard to reduce both their water usage (they’re stopping growing rice, for example) and their dependence on the Nile.

### Solvency

#### Contention 4: Solvency

#### Loan guarantees solve – conservative arguments about cronyism and risk underestimation ignore 20 years of data to the contrary

**Griffith and Caperton, 12** - John Griffith is a Policy Analyst with the Economic Policy team at the Center for American Progress. Richard Caperton is the Director of Clean Energy Investment at the Center (Major Analysis: Federal Loans And Loan Guarantees Have A Huge Benefit But A Low And Predicatable Cost, 5/3, <http://thinkprogress.org/climate/2012/05/03/475978/major-analysis-federal-loans-and-loan-guarantees-have-a-huge-benefit-but-a-low-and-predicatable-cost/>)

These programs typically run at very low cost to taxpayers. On average, every $1 allocated to loan and guarantee programs generates more than $99 of economic activity from individuals, businesses, nonprofits, and state and local governments, according to our analysis.¶ But in the wake of certain widely publicized credit blunders, most notably this past summer’s bankruptcy announcement from solar company Solyndra LLC, some have called into question Washington’s ability to manage financial risk. Conservative critics contend that the government is incapable of accurately pricing risk, and that political pressure encourages government agencies to routinely underestimate the risk to taxpayers when extending credit.¶ Government underpricing of risk is a convenient theory for free-market ideologues but it runs contrary to the overwhelming evidence.¶ Our review of federal government credit programs back to 1992 shows that on average the government is quite accurate in its risk pricing. In fact, the majority of government credit programs cost less than originally estimated, not more. Specifically, we found that:¶ Based on initial estimates over the past 20 years, the government expected its credit programs to cost taxpayers 79 cents for every $100 loaned or guaranteed. Based on recently updated data, those cost predictions were reasonably accurate but slightly underestimated. The current budgetary impact of these programs is about 94 cents per $100 loaned or guaranteed.¶ There’s little evidence that credit programs are biased toward underpricing risk. In fact, a little more than half of all nonemergency federal credit programs will cost the government less than what they are expected to over the life of the program.¶ The remainder is accounted for by the losses suffered by the Federal Housing Administration on loans made in 2008 during the peak of the housing crisis. Excluding that book of loans, all nonemergency federal credit programs cost slightly less than expected.¶ Conservative critics often portray a world in which government bureaucrats haphazardly issue loans and loan guarantees without considering taxpayer exposure to risk. That’s simply not the case. This issue brief explains how the government prices credit risk in the federal budget, how well those cost estimates have reflected reality over the years, and why the government is in a particularly good position to assume certain types of risk.¶ Budgeting for credit risk¶ Federal government agencies adhere to strict budget and accounting standards to carefully assess the risks and potential losses associated with credit programs. Here’s how it works.¶ Before an agency can issue any loans or loan guarantees, Congress must first authorize and allocate funding for the program. In most cases Congress starts by determining how much money the program will be authorized to guarantee or loan and then appropriates a certain percentage of that amount to cover the program’s expected cost to the government. That cost estimate—assessed by both the agency administering the program and the president’s Office of Management and Budget—takes into account expected repayments, defaults, recoveries, and any interest or fees collected over the life of the loan, adjusted to current dollars.¶ The net cost to the federal government as a percentage of total dollars loaned or guaranteed is known as the subsidy rate. As an example, say Congress approves a $100 million loan guarantee program within the Department of Agriculture. The department models expected market conditions and loan activity and then estimates a subsidy rate, which the Office of Management and Budget independently estimates as a check on the agency’s methodology. Let’s say the estimated subsidy rate is 0.75 percent. That means the government expects to take a net loss of 75 cents for every $100 it guarantees over the life of those loans. To cover expected losses on the $100 million in loan guarantees, the government sets aside $750,000 in a special account at the Treasury Department. This is similar to a loan loss reserve at a private bank.¶ Each subsequent year, the Office of Management and Budget and the agencies recalculate the subsidy rate to reflect actual loan performance, current economic conditions, and anything else administrators may have learned about a program. These revised numbers are reported in the president’s budget each year, which gives us a pretty good idea of each program’s “actual” costs and the government’s ability to assess financial risk.¶ If conservative claims were accurate in saying that the federal government cannot accurately price for risk, then one would expect the initial cost estimates to be significantly lower than the more recent re-estimates. Using the Department of Agriculture example above, if the critics were right, the re-estimated subsidy rate would presumably be much higher than 0.75 percent, and actual outlays would be higher than estimated. Let’s see how the government’s risk estimates actually stack up.¶ Government risk estimates are quite accurate¶ To test this theory, we analyzed credit data published in the president’s 2013 budget. We compared initial and updated cost estimates, also known as subsidy re-estimates, for each book of nonemergency loans and loan guarantees for each federal credit program since 1992, the first year for which comprehensive data are available.¶ We limit our analysis to nonemergency credit programs, omitting programs created in response to the recent financial crisis. This includes programs created through the Troubled Asset Relief Program—the so-called Wall Street rescue package passed by Congress at the height of the housing and financial crises—and the U.S. Department of the Treasury’s purchase of securities issued by the two troubled housing finance giants Fannie Mae and Freddie Mac. Both of these programs are temporary, atypically large, and are accounted for in the federal budget using different standards than all other credit programs.¶ If we had included these “emergency” programs, it would drastically skew the overall results—but skew them in favor of our basic argument. Based on our analysis of data published in the 2013 budget, these programs will cost the government about $130 billion less than initially expected. So their inclusion would make it seem as though the government significantly overestimated the cost of all credit programs over the past 20 years, which is not the case.¶ We also exclude any federal credit program that is not listed in the federal credit supplement of president’s budget, and any program that did not publish a subsidy re-estimate in the 2013 budget. We do this both because complete data are unavailable for these programs and because their costs are not recorded in the federal budget. Notably, this includes insurance programs through the Federal Deposit Insurance Corporation, mortgage guarantees offered by the two housing finance giants Fannie Mae and Freddie Mac (both now under government conservatorship), and guarantees on mortgage-backed securities offered by the government corporation Ginnie Mae.¶ Here’s what we found out about nonemergency federal credit programs. Federal agencies have issued $5.7 trillion worth of these loans or loan guarantees since 1992. Based on our analysis of initial estimates, the government expected these programs to cost taxpayers about 79 cents for every $100 loaned or guaranteed, or a 0.79 percent subsidy rate overall.¶ Of course, no one expects those estimates to be perfect. Many of these loans such as home mortgages or funding for large infrastructure projects take decades to pay back. Government financial analysts are charged with the difficult task of modeling payments, defaults, recoveries, and market conditions for the entire life of the loan, so some error has to be expected.¶ But as it turns out, the initial estimates weren’t very far off. The current budgetary impact of these credit programs is about 94 cents per $100 loaned or guaranteed, or a 0.94 percent subsidy rate, according to our analysis of updated subsidy estimates. To put that in a budgetary context, while issuing nearly $6 trillion in loans and guarantees over the past 20 years, the government initially predicted about $45 billion in total costs to taxpayers, but the actual costs were slightly higher—about $53 billion.¶ That difference—$8 billion over two decades or $400 million per year—might seem high at first. But it amounts to just 0.15 percent of the total dollars loaned or guaranteed by the government and 0.02 percent of all government spending over that period.(see Figure 1)¶ Of course, the federal government’s performance on individual programs varied substantially. Some programs overestimate risks, while others underestimate. But as mentioned above, some conservatives argue that political pressures cause the government to systemically underprice costs to taxpayers when issuing loans or guarantees.¶ The data show this to be untrue. Of the 104 nonemergency credit programs administered since 1992, our analysis shows that most have actually overestimated total subsidy costs. Fifty-six programs overpriced risk over their lifetimes, while 48 programs underpriced risk. (see Figure 2)¶ Our analysis only takes into account lifetime costs for each program, not the federal government’s ability to estimate costs on an individual year’s portfolio of loans. Indeed, critics often point to individual data points such as the Solyndra bankruptcy as evidence of the government’s inability to price financial risk. But what matters most is actually the net budgetary impact over time of these inaccuracies, which is what is measured in Figure 1.¶ Overall these overestimates and underestimates—whether across programs or in individual books of business—tend to roughly balance out in the long run, give or take a reasonable margin of error. As we show in the following section, however, all of these underestimated losses can actually be attributed to a single year of mortgage guarantees made at the height of the housing crisis.

#### Government support is vital-~--it overcomes financial barriers to nuclear that the market cannot

Yanosek 12 Kassia, entrepreneur-in-residence at Stanford University’s Steyer-Taylor Center for Energy Policy and Finance and a private equity investor in the energy sector as a principal at Quadrant Management and Founder of Tana Energy Capital LLC, " Financing Nuclear Power in the US", Spring, energyclub.stanford.edu/index.php/Journal/Financing\_Nuclear\_Power\_by\_Kassia\_Yanosek

Over the course of the last decade, it appeared that concerns about carbon emissions, aging coal fleets, and a desire for a diversified generation base were reviving the U.S. utility sector interest in building new nuclear plants. Government and companies worked closely on design certification for Generation III reactors, helping to streamline the licensing process. New loan guarantees from the federal government targeted for nuclear projects were created as part of the 2005 Energy Policy Act. Consequently, dozens of projects entered the planning stages. Following more than 30 years in which no new units were built, it looked as if the U.S. nuclear industry was making significant headway. However, it is yet to be seen how many new nuclear projects will actually make it beyond blueprints due to one of the largest barriers to new nuclear construction: financing risk. Large upfront capital costs, a complex regulatory process, uncertain construction timelines, and technology challenges result in a risk/return profile for nuclear projects that is unattractive for the capital markets without supplementary government or ratepayer support. To many investors, nuclear seems too capital-intensive. Nuclear energy has attractive qualities in comparison to other sources of electricity. A primary motivation to pursue the development of nuclear energy in the U.S. has been its low operating fuel costs compared with coal, oil, and gas-fired plants. Over the lifetime of a generating station, fuel makes up 78% of the total costs of a coal-fired plant. For a combined cycle gas-fired plant, the figure is 89%. According to the Nuclear Energy Institute, the costs for nuclear are approximately 14%, and include processing, enrichment, and fuel management/disposal costs. Today’s low natural gas prices have enhanced the prospects of gas-fired power, but utilities still remain cautious about over-investing in new natural gas generation given the historical volatility of prices. Furthermore, nuclear reactors provide baseload power at scale, which means that these plants produce continuous, reliable power to consistently meet demand. In contrast, renewable energies such as wind or solar are only available when the wind blows or the sun shines, and without storage, these are not suitable for large-scale use. Finally, nuclear energy produces no carbon emissions, which is an attractive attribute for utilities that foresee a carbon tax being imposed in the near future. Given nuclear’s benefits, one may wonder why no new nuclear units have been ordered since the 1970s. This hiatus is in great part due to nuclear’s high cost comparative to other alternatives, and its unique set of risks. As a result, financing nuclear has necessitated government involvement, as the cost of nuclear typically exceeds that of the cost of conventional generation technologies such as coal and natural gas fired generation on a levelized cost of energy (LCOE) basis. LCOE represents the present value of the total cost of building and operating a generating plant over its financial life, converted to equal annual payments and amortized over expected annual generation, and is used to compare across different power generation technologies. For both regulated utilities and independent power producers, nuclear is unattractive if the levelized cost exceeds that of other technologies, since state utility commissions direct regulated utilities to build new capacity using the technology with the lowest LCOE. Furthermore, capital costs are inherently high, ranging in the billions or tens of billions of dollars, and are compounded by financing charges during long construction times. Without government support, financing nuclear is currently notpossible in the capital markets. Recently, Constellation Energy and NRG separately pulled the plug on new multi-billion dollar plants, citing financing problems. Projects, however, will get done on a one-off basis. Southern Company’s Vogtle Plant in Eastern Georgia is likely to be the sponsor of the first new generation to be constructed, taking advantage of local regulatory and federal support. Two new reactors of next-generation technology are in the permitting stage, which will bring online 2,200 megawatts (MW) of new capacity, and will cost $14 billion. The project will take advantage of tax credits and loan guarantees provided in the 2005 Energy Policy Act.

#### And, loan guarantees solve nuclear expansion – shows investors the government has skin in the game, and incentivizes quick agency approval

Adams 10—Publisher of Atomic insights Was in the Navy for 33 years Spent time at the Naval Academy Has experience designing and running small nuclear plants (Rod, Concrete Action to Follow Strongly Supportive Words On Building New Nuclear Power Plants, atomicinsights.com/2010/01/concrete-action-to-follow-strongly-supportive-words-on-building-new-nuclear-power-plants.html)

Loan guarantees are important to the nuclear industry because the currently available models are large, capital intensive projects that need a stable regulatory and financial environment. The projects can be financed because they will produce a regular stream of income that can service the debt and still provide a profit, but that is only true if the banks are assured that the government will not step in at an inopportune time to halt progress and slow down the revenue generation part of the project. Bankers do not forget history or losses very easily; they want to make sure that government decisions like those that halted Shoreham, Barnwell’s recycling facility or the Clinch River Breeder Reactor program are not going to be repeated this time around. For the multi-billion dollar projects being proposed, bankers demand the reassurance that comes when the government is officially supportive and has some “skin in the game” that makes frivolous bureaucratic decisions to erect barriers very expensive for the agency that makes that decision. I have reviewed the conditions established for the guarantee programs pretty carefully – at one time, my company ([Adams Atomic Engines, Inc.](http://www.atomicengines.com)) was considering filing an application. The loan conditions are strict and do a good job of protecting government interests. They were not appropriate for a tiny company, but I can see where a large company would have less trouble complying with the rules and conditions. The conditions do allow low or no cost intervention in the case of negligence or safety issues, but they put the government on the hook for delays that come from bad bureaucratic decision making.

#### Plan is modeled internationally

**Blees et al** 11 (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) [http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/](http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http%3A//bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/)

There are many compelling reasons to pursue the rapid demonstration of a full-scale IFR, as a lead-in to a subsequent global deployment of this technology within a relatively short time frame. Certainly the urgency of climate change can be a potent tool in winning over environmentalists to this idea. Yet political expediency—due to widespread skepticism of anthropogenic causes for climate change—suggests that the arguments for rolling out IFRs can be effectively tailored to their audience. Energy security—especially with favorable economics—is a primary interest of every nation.¶ The impressive safety features of new nuclear power plant designs should encourage a rapid uptick in construction without concern for the spent fuel they will produce, for all of it will quickly be used up once IFRs begin to be deployed. It is certainly manageable until that time. Burying spent fuel in non-retrievable geologic depositories should be avoided, since it represents a valuable clean energy resource that can last for centuries even if used on a grand scale.¶ Many countries are now beginning to pursue fast reactor technology without the cooperation of the United States, laboriously (and expensively) re-learning the lessons of what does and doesn’t work. If this continues, we will see a variety of different fast reactor designs, some of which will be less safe than others. Why are we forcing other nations to reinvent the wheel? Since the USA invested years of effort and billions of dollars to develop what is arguably the world’s safest and most efficient fast reactor system in the IFR, and since several nations have asked us to share this technology with them (Russia, China, South Korea, Japan, India), there is a golden opportunity here to develop a common goal—a standardized design, and a framework for international control of fast reactor technology and the fissile material that fuels them. This opportunity should be a top priority in the coming decade, if we are serious about replacing fossil fuels worldwide with sufficient pace to effectively mitigate climate change and other environmental and geopolitical crises of the 21st century.

#### IFR’s S-PRISM design is really safe

**Blees et al 11** (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/

Metal Fuel: The Ultimate Safety Valve¶ One of the most important of the many superlatives of the IFR is its use of a metal fuel comprised of uranium, plutonium and zirconium, and the ingenious manner in which the Argonne team solved the problems of fuel expansion and fuel fabrication, as well as the potentially dangerous overheating scenario. Unlike the fuel fabrication of oxide-fueled reactors that requires the dimensions of the fuel pellets to be uniform to very exacting tolerances, the metal fuel for the IFR can be simply injected into molds and then cooled and inserted into metal tubes (cladding) with a great deal of dimensional tolerance, with a sodium bond filling any voids. If an accident situation occurs that would cause the core to overheat, such as a loss of coolant flow accident, the metal fuel itself will expand, causing neutron leakage to terminate the chain reaction, relying on nothing but the laws of physics.¶ The passive safety characteristics of the IFR were tested in EBR-II on April 3, 1986, against two of the most severe accident events postulated for nuclear power plants. The first test (the Loss of Flow Test) simulated a complete station blackout, so that power was lost to all cooling systems. The second test (the Loss of Heat Sink Test) simulated the loss of ability to remove heat from the plant by shutting off power to the secondary cooling system. In both of these tests, the normal safety systems were not allowed to function and the operators did not interfere. The tests were run with the reactor initially at full power.¶ In both tests, the passive safety features simply shut down the reactor with no damage. The fuel and coolant remained within safe temperature limits as the reactor quickly shut itself down in both cases. Relying only on passive characteristics, EBR-II smoothly returned to a safe condition without activation of any control rods and without action by the reactor operators. The same features responsible for this remarkable performance in EBR-II will be incorporated into the design of future IFR plants, regardless of how large they may be [xi].¶ While the IFR was under development, a consortium of prominent American companies led by General Electric collaborated with the IFR team to design a commercial-scale reactor based upon the EBR-II research. This design, currently in the hands of GE, is called the PRISM (Power Reactor Innovative Small Module). A somewhat larger version (with a power rating of 380 MWe) is called the S-PRISM. As with all new nuclear reactor designs (and many other potentially hazardous industrial projects), probabilistic risk assessment studies were conducted for the S-PRISM. Among other parameters, the PRA study estimated the frequency with which one could expect a core meltdown. This occurrence was so statistically improbable as to defy imagination. Of course such a number must be divided by the number of reactors in service in order to convey the actual frequency of a hypothetical meltdown. Even so, if one posits that all the energy humanity requires were to be supplies solely by IFRs (an unlikely scenario but one that is entirely possible), the world could expect a core meltdown about once every 435,000 years [xii]. Even if the risk assessment understated the odds by a factor of a thousand, this would still be a reactor design that even the most paranoid could feel good about.

#### IFRs are ready for commercial application – solves tech leadership and coal plants

**Kirsh 11** (Steven T. Kirsh, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, “Why Obama should meet Till,” 9/28/11) http://bravenewclimate.com/2011/09/28/why-obama-should-meet-till/¶ I will tell you the story of an amazing clean power technology that can use nuclear waste for fuel and emit no long-lived nuclear waste; that can supply clean power at low cost for our planet, 24×7, for millions of years without running out of fuel. I will tell you why this technology is our best bet to reduce the impact of global warming on our planet. And finally, I will tell you why nobody is doing anything about it and why this needs to be corrected.¶ If you act on this letter, you will save our country billions of dollars and allow us to become leaders in clean energy. If you delegate it downward, nothing will happen.¶ I have no vested interest in this; I am writing because I care about the future of our planet¶ First, since we met only briefly during the Obama campaign, let me provide a little background about myself. I am a high-tech entrepreneur and philanthropist based in Silicon Valley. I have received numerous awards for my philanthropy. For example, in 2003, I was honored to receive a National Caring Award presented by then Senator Clinton. The largest engineering auditorium at MIT is named in my honor. The first community college LEED platinum building in the nation is also named in my honor.¶ I am also active in Democratic politics. In the 2000 election, for example, I was the single largest political donor in the United States, donating over $10 million dollars to help Al Gore get elected. Unfortunately, we lost that one by one vote (on the Supreme Court).¶ I have no vested interest in nuclear power or anything else that is described below. I write only as someone who cares about our nation, the environment, and our planet. I am trying to do everything I can so my kids have a habitable world to live in. Nothing more.¶ Dr. James Hansen first made me aware of fast reactors in his letter to Obama in 2009¶ As an environmentalist, I have been a fan of Jim Hansen’s work for nearly two decades. Many consider Dr. Hansen to be the world’s leading expert on global warming. For example, Hansen was the first person to make Congress aware of global warming in his Senate testimony in 1988. Hansen is also Al Gore’s science advisor.¶ In 2009, Dr. Hansen wrote a letter to President Obama urging him to do just three things that are critical to stop global warming: 1) phase out coal plants, 2) impose a feebate on carbon emissions with a 100% rebate to consumers and 3) re-start fourth generation nuclear plants, which can use nuclear waste as fuel. Hansen’s letter to Obama is documented here: http://www.guardian.co.uk/environment/2009/jan/02/obama-climate-change-james-hansen¶ Upon reading Hansen’s recommendations, I was fascinated by the last recommendation. The fourth-generation power plants Hansen advocated sounded too good to be true. If what Hansen was saying was true, then why wasn’t our nation jumping on that technology? It made no sense to me.¶ Lack of knowledge, misinformation, and the complexity of nuclear technology have hampered efforts to get a fast reactor built in the US¶ I spent the next two years finding out the answer to that question. The short answer is three-fold: (1) most people know absolutely nothing about the amazing fourth generation nuclear power plant that we safely ran for 30 years in the US and (2) there is a lot of misleading information being spread by seemingly respectable people (some of whom are in the White House) who never worked on a fourth generation reactor that is totally false. It’s not that they are misleading people deliberately; it’s just that they were either listening to the wrong sources or they are jumping to erroneous conclusions. For example, the most popular misconception is that “reprocessing is a proliferation risk.” That statement fails to distinguish between available reprocessing techniques. It is absolutely true for the French method but it is absolutely not true for the technology described in this letter! The third reason is that the technology is complicated. Most people don’t know the difference between oxide fuel and metal fuel. Most people don’t know what a fast reactor is. Most people can’t tell you the difference between PUREX, UREX, and pyroprocessing. So people with an agenda can happily trot out arguments that support their beliefs and it all sounds perfectly credible. They simply leave out the critical details.¶ We don’t need more R&D. We already have a technology in hand to help us solve global warming and safely get rid of our nuclear waste at low cost. But we aren’t doing anything with it. That’s a serious mistake.¶ Today, our nation faces many serious challenges such as:¶ How can we avert global warming?¶ How can we dispose of our existing nuclear waste safely?¶ How can we generate base-load carbon-free power at very low cost?¶ How can we avoid creating any additional long-lived nuclear waste?¶ How can we grow our economy and create jobs?¶ How can we become the world leader in clean energy?¶ How can we do all of the above while at the same time spending billions less than we are now?¶ The good news is that we already have a proven technology that can address all of these problems. It is a technology that has enjoyed over 30 years of bi-partisan Congressional and Presidential support. It is an advanced nuclear technology that was invented in 1951 by the legendary Walter Zinn and then refined and perfected over a 30 year period, from 1964 to 1994 by Dr. Charles Till who led a team of 1,200 people at the Argonne National Laboratory. Till’s reactor was known as the Integral Fast Reactor (IFR) because it both produced power and recycled its own waste back into the reactor. This is the technology that Hansen referenced in his letter to the President.¶ The IFR is a fourth-generation nuclear design that has several unique and valuable characteristics:¶ It can use our existing nuclear waste (from power plants and weapons) as fuel; we have over 1,000 years of power available by just using today’s nuclear waste. Instead of trying to bury that “waste” in Yucca Mountain, we could be using it for fuel in fast reactors.¶ It generates no long-lived nuclear waste.¶ It is safer than today’s light water reactor (LWR) nuclear power plants. Unlike the Fukushima LWR reactors (a second generation nuclear technology invented 50 years ago), the IFR does NOT require electricity to shut down safely. The IFR shuts down passively if a mishap occurs; no operator intervention or active safety systems are required. They ran the Three Mile Island and Chernobyl scenarios on a live reactor and the reactor shut itself down safely, no operator intervention required, just as predicted. In addition, unlike with LWRs, the IFR runs at low pressure which adds to the safety profile.¶ It reduces the risk of nuclear proliferation because: (1) it eliminates the need for enrichment facilities (which can be used for making nuclear bomb material), (2) the nuclear material that is used in the IFR is not suitable for making bombs and (2) because the nuclear material in the reactor and in the reprocessing hot cell is too “hot” to be stolen or used in a weapon.¶ Experts at General Electric (GE) believe that the IFR has the potential to produce power for less than the price of coal. Dr. Loewen can confirm that if you have any doubts.¶ GE already has an IFR design on the table that they would like to build as soon as possible. Dr. Loewen can confirm that as well.¶ The US Nuclear Regulatory Commission, in January 1994, issued a pre-application safety evaluation report in which they found no objections or impediments to licensing the IFR. You can see the NRC report in the 8 minute video.¶ The design is proven. It produced electric power without mishap for 30 years before the project was abruptly cancelled.¶ Dr Charles Till¶ The IFR’s ability to solve the nuclear waste problem should not be underestimated. As respected nuclear experts have pointed out, a practical solution to the nuclear waste problem is required if we are to revive nuclear power in the United States. The Blue Ribbon Commission (BRC) on America’s Nuclear Future basically concluded this: “continue doing the same thing we are doing today and keep doing R&D.” That was predictable because it was a consensus report; everyone had to agree. So nothing happened. And because there was no consensus from the BRC , there is less money for nuclear because there is no solution to the waste problem. It’s a downward death spiral.¶ Please pardon me for a second and allow me to rant about consensus reports. In my 30 year career as an entrepreneur, I’ve raised tens of millions of millions of dollars in investment capital from venture capitalists all over the world. I always ask them how they make investment decisions. They always tell me, “If we had to get all partners to agree on an investment, we’d never make any investments. If you can get two partners to champion your company, that is sufficient to drive an investment decision.” Therefore, if you want to get nothing done, ask for a consensus report. If you want to actually solve problems, you should listen to what the people most knowledgeable about the problem are saying.¶ Dr Yoon I. Chang¶ Had President Obama asked the Commissioners on the Nuclear Regulatory Commission (NRC) who have the most knowledge of fast reactors the same question that he tasked the BRC with, he would have gotten a completely different answer. They would have told President Obama that fast reactors and pyroprocessing are the way to go and we better get started immediately with something that we already know works because there is still a ten year time if we were to start the reactor building process today. Their advice leads to a viable solution that we know will work and it will make the US a leader in clean nuclear power. Following the BRC’s consensus advice will lead to decades of inaction. Totally predictable.¶ If we put a national focus on developing and cost reducing the IFR, we’d have a killer product and lead the world in being a clean energy leader¶ It would be great if we had a long-term strategy and vision for how we become energy independent and solve the global warming problem and help our economy at the same time. The IFR can play a key role in that vision. If we put a national focus on developing and commercializing the IFR technology we invented, we can create jobs, help our trade balance, mitigate global warming, become energy independent, show the world a safe way to get rid of nuclear waste, and become the leaders in clean power technology.¶ Nuclear power is the elephant in the room. Even though we haven’t built a new nuclear plant in 30 years, nuclear still supplies 70% of the clean energy in America today. That feat was largely accomplished in a single ten year period. Renewables have had 3 decades to “catch up” and they aren’t anywhere close. Nuclear’s continued dominance shows that nuclear power is indeed the elephant in the room when it comes to being able to install clean energy quickly and affordably.¶ The bad news is that President Clinton decided that this technology, which would have produced unlimited amounts of base-load carbon-free power for a price as low as anything else available today, was not needed and cancelled the project in 1994.¶ Cancelling the IFR was a big mistake. It’s still the world’s best fast nuclear technology according to an independent study by the Gen IV International Forum.¶ Many top scientists all over the world believe that President Clinton’s decision was a huge mistake. The Senate had voted to continue to fund it. The project had been supported by six US Presidents; Republicans and Democrats. In fact, the project’s biggest proponent was Republican President Richard Nixon who said in 1971, “Our best hope today for meeting the Nation’s growing demand for economical clean energy lies with the fast breeder reactor.”¶ Republican Senator Kempthorne said of the IFR cancellation:¶ Unfortunately, this program was canceled just 2 short years before the proof of concept. I assure my colleagues someday our Nation will regret and reverse this shortsighted decision. But complete or not, the concept and the work done to prove it remain genius and a great contribution to the world.¶ While I am not a big fan of Senator Kempthorne, I couldn’t agree more with what he said in this particular case.¶ The IFR remains the single best advanced nuclear power design ever invented. That fact was made clear when in 2002, over 240 leading nuclear scientists from all over the world (in a Gen IV International Forum sponsored study) independently evaluated all fourth-generation nuclear designs and ranked the IFR the #1 best overall advanced nuclear design.¶ The IFR was cancelled in 1994 without so much as a phone call to anyone who worked on the project. They didn’t call then. They haven’t called since. They simply pulled the plug and told people not to talk about the technology.¶ The US government invested over $5 billion dollars in the IFR. Fast reactor R&D is largest single technology investment DOE has ever made. According to a top DOE nuclear official (Ray Hunter, the former NE2 at DOE), the “IFR became the preferred path because of waste management, safety, and economics.” The reactor produced power for 30 years without incident. Despite that track record, before it was cancelled, nobody from the White House ever met with anyone who worked on the project to discuss whether it should be terminated or not. It was simply unilaterally terminated by the White House for political reasons. Technical experts were never consulted. To this day, no one from the White House has met with Dr. Till to understand the benefits of the project. The technical merits simply did not matter.¶ I urge you to recommend to President Obama that he meet personally with Dr. Charles Till so that the President can hear first hand why it is so critical for the health of our nation and our planet that this project, known as the Integral Fast Reactor (IFR), be restarted. Dr. Till headed the project at Argonne National Laboratory until his retirement in 1997. He is, without a doubt, the world’s leading expert on IFR technology.¶ Want to solve global warming? Easy. Just create a 24×7 clean power source that costs the same as coal. Prominent scientists believe that the IFR can achieve this.¶ Dr. Hansen has pointed out many times that it is imperative to eliminate all coal plants worldwide since otherwise, we will never win the battle against global warming. But we know from experience that treaties and agreements do not work. Here’s a quote from an article (“The Most Important Investment that We Aren’t Making to Mitigate the Climate Crisis”) that I wrote in December 2009 published in the Huffington Post:¶ If you want to get emissions reductions, you must make the alternatives for electric power generation cheaper than coal. It’s that simple. If you don’t do that, you lose.¶ The billions we invest in R&D now in building a clean and cheaper alternative to coal power will pay off in spades later. We have a really great option now — the IFR is on the verge of commercial readiness — and potential competitors such as the Liquid Fluoride Thorium Reactor (LFTR) are in the wings. But the US government isn’t investing in developing any of these breakthrough new base-load power generation technologies. Not a single one.¶ I found it really amazing that global leaders were promising billions, even hundreds of billions in Copenhagen for “fighting climate change” when they weren’t investing one cent in the nuclear technologies that can stop coal and replace it with something cheaper.¶ [ Note: 6 days ago, on September 22, 2011, DOE agreed to give $7.5M to MIT to do R&D on a molten-salt reactor. That’s good, but we should be building the technology we already have proven in 30 years of operational experience before we invest in unproven new technologies. ]¶ Dr. Loewen has personally looked at the costs for the building the IFR in detail and believes the IFR can generate power at a cost comparable to a coal plant. So it’s arguably our best shot at displacing coal plants. This is precisely why Dr. Hansen believes that the IFR should be a top priority if we want to save our planet.¶ It isn’t just nuclear experts that support the IFR¶ US Congressman John Garamendi (D-CA) is also a major IFR supporter. When he was Lt. Governor of California, Congressman Garamendi convened a panel of over a dozen our nation’s top scientists to discuss the IFR technology. As a result of that meeting, Garamendi became convinced that the IFR is critically important and he is currently trying very hard to get a bill passed in the House to restart it. Unfortunately, virtually everyone in Congress seems to have forgotten about this project even though in the 1970’s it was the President’s top energy priority. Nothing has changed since then. No other clean energy technology has been invented that is superior to the IFR for generating low-cost carbon-free base-load electric power.¶ Bill Gates also found exactly the same thing when he looked at how to solve the global warming problem. As he explained in a recent TED talk, renewables will never solve the climate crisis. The only viable technology is fourth-generation nuclear power and the best advanced nuclear technology is the IFR. That is why this is Gate’s only clean energy investment. Gates’ TerraPower Travelling Wave Reactor (TWR) is a variant of the IFR design. When Gates approached DOE to try to build his reactor in the US, he was told to build it outside of the US.¶ Nobel prize winner Hans Bethe (now deceased) was an enthusiastic supporter. Freeman Dyson called Bethe the “supreme problem solver of the 20th century. Chuck Till told me the following story of Bethe’s support for the IFR:¶ A tale from the past: A year or two before the events I’ll describe, Hans Bethe had been contacted by the Argonne Lab Director for his recommendation on who to seek to replace the existing head of Argonne’s reactor program.¶ Bethe told him the best choice was already there in the Lab, so it was in this way that I was put in charge. I had had quite a few sessions with him in the years leading up to it, as we were able to do a lot of calculations on the effects of reactor types on resources that he didn’t have the capability at his disposal to do himself.¶ So when I wanted to initiate the IFR thrust, the first outside person I went to was Bethe at Cornell. After a full day of briefing from all the specialists I had taken with me, he suggested a brief private meeting with me. He was direct. He said “All the pieces fit. I am prepared to write a letter stating this. Who do you want me to address it to? I think the President’s Science Advisor, don’t you?” I said the obvious – that his opinion would be given great weight, and would give instant respectability.¶ He went on, “I know him quite well. Who else?” I said I was sure that Senator McClure (who was chairman of Senate Energy and Resources at the time) would be relieved to hear from him. That the Senator would be inclined to support us, as we were fairly prominent in the economy of the state of Idaho, and for that reason I had easy access to him. But to know that Hans Bethe, a man renowned for his common sense in nuclear and all energy matters, supported such an effort would give him the Senator solid and quotable reason for his own support, not dismissible as parochial politics, that the Senator would want if he was to lead the congressional efforts. “Yes,” he said in that way he had, “I agree.”¶ I’ve always thought that the President’s Science Advisor’s intervention with DOE, to give us a start, was not the result of our meeting him, but rather it was because of the gravitas Hans Bethe provided with a one page letter.¶ How do we lead the world in clean energy if we put our most powerful clean energy technology on the shelf?!?¶ President Obama has stated that he wants the US to be a leader in clean energy. I do not see how we achieve that if we allow our most advanced clean energy technology to sit on the shelf collecting dust and we tell one of America’s most respected businessmen that he should build his clean energy technology in another country. We have an opportunity here to export energy technology to China instead of importing it. But due to Clinton’s decision, we are allowing the Russians to sell similar fast reactor technology to the Chinese. It should have been us.¶ Re-starting the IFR will allow us to cancel a $10 billion stupid expenditure. The IFR only costs $3B to build. We’d get more, pay less. On pure economics alone, it’s a no brainer.¶ Finally, even if you find none of the arguments above to be compelling, there is one more reason to restart the IFR project: it will save billions of dollars. Today, we are contracting with the French to build a MOX reprocessing plant in Savannah River. The cost of that project is $10 billion dollars. We are doing it to meet our treaty obligations with the Russians. Former top DOE nuclear managers agree this is a huge waste of money because we can build an IFR which can reprocess 10 times at much weapons waste per year for a fraction of that cost.¶ The Russians are laughing at our stupidity. They are going to be disposing of their weapons waste in fast reactors, just like we should be. The Russians are also exporting their fast reactors to the Chinese. Had the US not cancelled our fast reactor program, we would be the world leader in this technology because our technology remains better than any other fourth generation technology in the world.¶ If you delegate this to someone else, nothing will happen. Here’s why.¶ Delegating this letter downward from the White House to someone in DOE to evaluate will result in inaction and no follow up. I know this from past attempts that have been made. It just gets lost and there is no follow up. Every time. The guys at DOE want to do it, but they know that they will get completely stopped by OMB and OSTP. Both Carol Browner and Steven Chu asked former DOE nuclear management what to do about nuclear waste. They were told that using fast reactors and reprocessing was the way to go. But nothing happened. So Chu has given up trying. According to knowledgeable sources, the White House has told DOE in no uncertain terms, “do not build anything nuclear in the US.” It’s not clear who is making these decisions, but many people believe it is being driven by Steven Fetter in OSTP.¶ Dr. Till knows all of this. He knows that unless he personally meets with the President to tell the story of this amazing technology, nothing will happen.¶ I’ve discussed the IFR with Steve Fetter and he has his facts wrong. Fetter is basically a Frank von Hippel disciple: they have written at least 14 papers together! It was von Hippel who was largely responsible for killing the IFR under Clinton.¶ So von Hippel’s misguided thought process is driving White House policy today. That’s a big mistake. Professor von Hippel twists the facts to support his point of view and fails to bring up compelling counter arguments that he knows are true but would not support his position. He’s not being intellectually honest. I’ve experienced this myself, firsthand. For example, von Hippel often writes that fast reactors are unreliable. When I pointed out to him that there are several examples of reliable fast reactors, including the EBR-II which ran for decades without incident, he said, that these were the “exceptions that prove the rule.” I was floored by that. That’s crazy. It only proves that it is complicated to build a fast reactor, but that it can easily be done very reliably if you know what you are doing. There is nothing inherent to the technology that makes it “unreliable.” You just have to figure out the secrets. When von Hippel heard that Congressman Garamendi was supporting the IFR, he demanded a meeting with Garamendi to “set him straight.” But what happened was just the opposite: Garamendi pointed out to von Hippel that von Hippel’s “facts” were wrong. Von Hippel left that meeting with Garamendi with his tail between his legs muttering something about that being the first time he’s ever spoken with anyone in Congress who knew anything about fast nuclear reactors. In short, if you watch a debate between von Hippel and Garamendi (who is not a scientist), Garamendi easily wins on the facts. If you put von Hippel up against someone who knows the technology like Till, Till would crush von Hippel on both the facts and the arguments. But the Clinton White House never invited Till to debate the arguments with von Hippel. They simply trusted what von Hippel told them. Big mistake.¶ There are lots of problems with von Hippel’s arguments. For example, von Hippel ignores reality believing that if the USA doesn’t do something then it will not happen. That’s incredibly naieve and he’s been proven wrong. The USA invented a safe way to reprocess nuclear waste that isn’t a proliferation risk called pyroprocessing. The nuclear material is not suitable for making a bomb at any time in the process. But we never commercialized it because von Hippel convinced Clinton to cancel it. The French commercialized their reprocessing process (PUREX) which separates out pure plutonium and makes it trivial to make bomb material. So because countries need to reprocess, they pick the unsafe technology because they have no alternative. Similarly, because von Hippel had our fast reactor program cancelled, the Russians are the leaders in fast reactor technology. They’ve been using fast reactor technology for over 30 years to generate power commercially. But we know the Russians have a terrible nuclear safety record (e.g., Chernobyl). The fact is that the Chinese are buying fast reactors from the Russians because there is no US alternative. The problem with von Hippel’s arguments are that the genie is out of the bottle. We can either lead the world in showing how we can do this safely, or the world will choose the less safe alternatives. Today, von Hippel’s decisions have made the world less safe. I could go on and on about how bad von Hippel’s advice is, but this letter is already way too long.¶ MIT was wrong in their report about “The Future of the Nuclear Fuel Cycle”¶ The only other seemingly credible argument against building fast reactors now comes from MIT. The report’s recommendation that we have plenty of time to do R&D appears largely to be driven by one person, co-chair Ernie Moniz.¶ Four world-famous experts on nuclear power and/or climate change and one Congressman challenged Moniz to a debate on the MIT campus on his report. Moniz declined.¶ The report has several major problems. Here are a few of them.¶ The MIT report is inconsistent. On the one hand it says, “To enable an expansion of nuclear power, it must overcome critical challenges in cost, waste disposal, and proliferation concerns while maintaining its currently excellent safety and reliability record.” We agree with that! But then it inexplicably says, “… there are many more viable fuel cycle options and that the optimum choice among them faces great uncertainty…. Greater clarity should emerge over the next few decades… A key message from our work is that we can and should preserve our options for fuel cycle choices by …[continuing doing what we are doing today] … and researching technology alternatives appropriate to a range of nuclear energy futures.” So even though we have a solution now that can be deployed so we can enable an expansion of nuclear power as soon as possible, MIT advises that we should spend a few more decades because we might find something better than the IFR. This is just about the dumbest thing I’ve ever heard coming from MIT. If you ask any scientist who knows anything about global warming, they will tell you we are decades late in deploying carbon-free power. Had we aggressively ramped fast nuclear closed-cycle reactors decades ago and promoted them worldwide, we wouldn’t be anywhere close to the disastrous situation we are in today. So we are decades too late in ramping up nuclear power, and Moniz wants us to spend decades doing more R&D to get a solution that might be lower cost than the IFR. That’s insane.¶ The report looks at the market price of uranium, but the market price completely ignores the environmental impacts of uranium mining. Shouldn’t that be taken into account? It’s like the cost of gas is cheap because the market price doesn’t include the hidden costs: the impact on the environment and on our health.¶ Do you really think that people are going to embrace expansion of uranium mining in the US? The MIT report is silent on that. So then we are back to being dependent on other countries for uranium. Wasn’t the whole point to be energy independent? The IFR provides that now. We wouldn’t have to do any uranium mining ever again. After a thousand years, when we’ve used all our existing nuclear waste as fuel, we can extract the additional fuel we need from seawater, making our seas less radioactive. We can do that for millions of years.¶ The MIT report ignores what other countries are doing. Obama wants the US to be a leader in clean energy technology. You do that by building the most advanced nuclear designs and refining them. That’s the way you learn and improve. MIT would have us stuck on old LWR technology for a few decades. Does anyone seriously think that is the way to be the world leader? There is virtually no room for improvement in LWR technology. IFR technology is nearly 100 times more efficient, and it emits no long term nuclear waste. If you are a buyer of nuclear power in China, which nuclear reactor are you going to pick? The one that is 100 times more efficient and generates no waste? Or the one that is 100 times less efficient and generates waste that you better store for a million years? Wow. Now that’s a real tough question, isn’t it. Gotta ponder that one. I’m sure Apple Computer isn’t taking advice from Moniz. If they were, they’d still be building the Apple I. Ernie should get a clue. The reason Apple is a market leader is because they bring the latest technology to market before anyone else, not because they keep producing old stuff and spend decades doing R&D to see if they can come up with something better. Other countries are not hampered by MIT’s report. France and Japan recently entered into an agreement with the US DOE whereby we’re giving them the IFR technology for them to exploit. Even though we are stupid, they aren’t stupid. The Chinese are ordering inferior oxide fueled fast reactors from Russia. If the US were building metal-fueled fast reactors with pyroprocessing, it’s a good bet the Chinese would be buying from us instead of the Russians. But if we take Moniz’s advice to not build the world’s best advanced nuclear technology we already have, then there is no chance of that happening. By the time we get to market with a fast reactor, it will be all over. We’ll arrive to the market decades late. Another great American invention that we blew it on.¶ There will always be new technologies that people will propose. But the IFR is a bird in the hand and we really need a solution now we can depend on. If something comes along later that is better, that’s great. But if it doesn’t, we will have a viable technology. We can’t afford to get this wrong. We have already run out of time. Any new nuclear designs are decades away from deployment.¶ On September 22, 2011, DOE agreed to give MIT $7.5 millions of dollars on starting R&D on a fourth generation molten salt reactor design that have never been proven. While it might work, the very smart scientists at Oak Ridge National Laboratory spent well over a decade on this and were never able to make it work. So DOE is spending millions on an unproven design while spending nothing on the “sure thing” fourth generation reactor that we already know how to build and that ran flawlessly for 30 years. We are all scratching our heads on that one. It makes no sense. But the reason for this is clear: the mandate from the White House that nothing is to built means that DOE can only initiate research, and then cancel the project right before anything would be built. This is an excellent plan for demoralizing scientists and allowing other countries to lead the world in clean energy. Is that really what we want?? If so, then there are much less expensive ways to accomplish that.¶ At a minimum we should be investing in commercializing our “bird in the hand.” That way, if the new molten salt reactor experiments don’t work out, we’ll still have a viable solution to the nuclear waste problem. If we keep cancelling successful projects right before they are done, hoping for the next big thing, we will forever be in R&D mode and get nothing done. That’s where we are today with fourth generation nuclear.¶ I know this is an unusual request, but I also know that if the President is allowed to evaluate the facts first hand, I am absolutely convinced that he will come to the same conclusion as we all have.¶ I urge you to view an 8 minute video narrated by former CBS Morning News anchor Bill Kurtis that explains all of this in a way that anyone can understand. This video can be found at:¶ The video will amaze you.¶ If you would like an independent assessment of what I wrote above from a neutral , trustworthy, and knowledgeable expert, Bill Magwood would be an excellent choice. Magwood was head of nuclear at DOE under Clinton and Bush, and was the longest serving head of nuclear at DOE in US history. He served under both Clinton and Bush administrations. Magwood is familiar with the IFR, but the IFR was cancelled before he was appointed to head civilian nuclear at DOE. So Magwood has no vested interest in the IFR at all. More recently, Magwood was appointed by President Obama to serve on the NRC and is currently serving in that role. Of the current five NRC Commissioners, Magwood is by far, the person most knowledgeable (PMK) about fast reactors.¶ Thank you for your help in bringing this important matter to the President’s attention.¶ Summary¶ Nuclear power is needed. Renewables alone won’t do it.¶ In order to revive nuclear in the US, you must have a viable solution to the nuclear waste problem.¶ The French reprocess their nuclear waste, but their process is expensive, environmentally unfriendly, and has proliferation problems.¶ The USA developed an inexpensive, environmentally friendly, and proliferation resistant method to reprocess our waste (the IFR), but we cancelled it. That decision was a mistake.¶ We should restart the IFR in the US. It will cost $3B to build, but we can cancel the Areva MOX plant and save $10B to pay for it. So we’ll save money, save the planet from an environmental catastrophe, create jobs, get rid of our nuclear waste, and become the world leader in clean energy technology.¶ President Obama should meet personally with Dr. Charles Till, the world’s leading expert on fast reactor technology. Dr. Till will not waste his time meeting with anyone other than the President because he knows that without personal support of the President, nothing will happen. He’s right.¶ Supporters of this technology include Nobel prize winner Hans Bethe (now deceased), Steven Chu, Dr. James Hansen, Dr. Charles Till, Dr. Eric Loewen, Congressman John Garamendi, Bill Gates, and even the President of MIT. Even the board of directors of the historically anti-nuclear Sierra Club has agreed that they will not oppose building an IFR!¶ Opposition is from OSTP and OMB. We don’t know who or why. It’s a mystery to all my sources. Frank von Hippel thinks you cannot make fast reactors cheaply or reliably and maintains that stance even when the facts show that not to be the case. Ernie Moniz at MIT thinks we shouldn’t build anything now, but do more R&D for the next several decades hoping we can find something better.¶ Bill Magwood, an Obama appointee to the NRC, would be a reasonable choice to provide an objective assessment of the IFR. He has no vested interested in the IFR, but having been the longest serving head of DOE civilian nuclear in history, is familiar with the pros and cons of the technology.¶ Should OSTP and OMB be making these key decisions behind closed doors? Is this really reflective of what the President wants? He’s stated publicly he wants the US to be a world leader in clean energy. Is putting our best technology on the shelf, but licensing the French and Japanese to build it (Joint Statement on Trilateral Cooperation in the area of Sodium-cooled Fast Reactors signed on October 4, 2010 by DOE), the best way for the US to achieve the leadership that Obama said he wanted?¶ I am happy to provide you with additional information.

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### Solvency – AT: Cost Overruns

#### The aff solves -- increasing nuclear construction drives down costs and prevents overruns.

**Spencer, ‘8**

[Jack, Research Fellow in Nuclear Studies -- The Heritage Foundation, 3-19, “Finland's Rational Approach to Nuclear Power,” http://www.heritage.org/Research/Energyandenvironment/bg2117.cfm]

Critics have questioned the economic viability of nuclear power based on delays associated with Fin­land's reactor.[8] At $1.4 billion over budget and two years behind schedule, Finland's reactor has had its problems.[9] However, these delays and cost overruns are not necessarily indicative of the future economic viability of nuclear power. Olkiluoto 3 is a first-of-a-kind, large, multibil­lion-dollar power station. Assigning all of the costs of the first plant to future plants would not be accuate. Construction costs will be reduced as lessons learned from initial construction projects are inte­grated into future ones. Some of the overruns are simply a reflection of rising labor and material costs. These increases, which are not unique to the nuclear industry, would affect any project. Building the 3,200 windmills that would be needed to produce the same amount of electric­ity as Olkiluoto 3 will produce would likely suffer from the same price volatility.[10] A lack of skilled personnel, shortages of nuclear-qualified components and materials, and inexperi­enced vendors and subcontractors have also slowed progress.[11] Very few reactors have been ordered over the past three decades, and the industrial base and skill sets are simply not yet available to support the growing demand for commercial nuclear power. Although these risks should have been expected for a project like Olkiluoto 3, they are also correctable and will be resolved by the market over time**.**¶ As backlogs are created by new orders, nuclear suppliers will invest to expand capacity. For exam­ple, Japan Steel Works has already announced that it will expand its capacity to produce the large forg­ings used to manufacture reactor components. It is the sole supplier of these forgings on the world mar­ket. Other companies have made similar announce­ments to provide expanded uranium enrichment, mining, manufacturing, and used-fuel services. This growth in capacity will eventually meet demand and moderate some of the inflationary pressures that are driving up costs for Finland's newest reactor.

### Solvency – AT: Natural Gas

#### Gas supply crunch coming now – shale production ceilings and economics

Nelder, 12 [Chris, Smart Planet, February, Everything you know about shale gas is wrong, <http://www.smartplanet.com/blog/energy-futurist/everything-you-know-about-shale-gas-is-wrong/341>]

But now there’s even more bad news: U.S. gas production appears to have hit a production ceiling, and is actually declining in major areas. The startling revelation comes from a new [paper](http://www.theoildrum.com/node/8914) published today by Houston-based petroleum geologist and energy sector consultant Arthur Berman. Berman reached this conclusion by compiling his own production history of U.S. shale gas from a massive data set licensed from data provider HPDI. His well-by-well analysis found that total U.S. gas production has been on an “undulating plateau” since the beginning of 2009, and showed declines in some areas in 2011. This stands in stark contrast to recent data provided by the EIA, which shows shale gas production rising steadily for the past two years, and well into the future. The EIA’s forecast is bullish because it’s **mainly a view of demand**, **without great regard for supply limits**. But their historical supply data differs for a reason that will be no surprise to experienced observers: the data is bad. The EIA gets its data on shale gas production by sampling the reports of major operators, then applying a formula to estimate how much gas is actually being produced, according to Berman. This may explain why they only have official monthly historical production data for the [two years](http://www.eia.gov/dnav/ng/hist/ngm_epg0_fgs_nus_mmcfm.htm) (unofficially, [three](http://www.eia.gov/dnav/ng/ng_prod_shalegas_s1_a.htm)) of 2008 and 2009, and only annual data for 2010 and 2011. This has been a big red flag to me in my recent work on shale gas, accustomed as I am to EIA’s far more detailed and up-to-date monthly and weekly data on oil, and has made it nearly impossible to verify the claim that we’ve had “booming” gas production over the past two years. Data is also available directly from the states, but some **states have flawed reporting processes,** the granularity and reporting frequency varies (as low as every six months, in the case of Pennsylvania), and ultimately the data **isn’t available in a usable format**. It’s also inaccurate and incomplete, as one Pittsburgh newspaper recently [found out](http://www.post-gazette.com/pg/12008/1202172-503-0.stm). Berman reached the same conclusion, noting in his paper that “the data that EIA makes available does not have sufficient resolution to evaluate individual plays or states.” So he had to build his own database. An unprofitable treadmill One reason for the recent slowdown in production growth is that “unconventional” shale gas wells have to make up for the decline of conventional gas wells, which has accelerated from 23 percent per year in 2001 to 32 percent per year today. The U.S. now needs to replace 22 billion cubic feet per day (Bcf/d) of production each year just to maintain flat supply. Currently, all shale gas plays together produce around 19 Bcf/d. The shift to unconventional gas has put us on a production treadmill: We have to keep drilling like mad to maintain output because unconventional wells are far less productive and shorter-lived than conventional gas wells. Berman observes that an average gas well in Texas in 2010 produces one-fifth as much gas as an average conventional gas well did in 1972. In 1972, 23,000 gas wells produced 7.5 trillion cubic feet in Texas; in 2010, it took 102,000 wells to produce 6.4 trillion cubic feet. Another reason was that the spurt of production created a gas glut and drove prices far below the level of profitability. Data from a January, 2012 [presentation](http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NDUxNzk4fENoaWxkSUQ9NDc2OTUwfFR5cGU9MQ==&t=1) by the CEO of gas operator Range Resources showed that gas needs to sell for at least $4 per million BTU in order for operators to turn a profit. Source: Jonathan Callahan, [The Oil Drum](http://www.theoildrum.com/node/8900). Data from Range Resources. Berman is certain that the $4 threshold applies to new drilling on existing plays only; after accounting for land leasing, overhead and debt service, the threshold would be much higher. In any case, we can see that production flattened out when prices fell below $4 at the beginning of 2009. Source: Arthur Berman. Data from Natural Gas Intelligence. A gas price below $3 spells real trouble for operators, and flagging production is but the first effect. The next is debt: According to analysis by ARC Financial Research, the 34 top U.S. publicly traded shale gas producers are currently carrying a combined $10 billion quarterly cash flow deficit. And finally, **there will the destruction of forward supply, as new development grinds down.** Financing further development with debt in this environment will be extremely difficult, and eventually even the joint-venture sugar daddies that have sustained operators over the past few months will get cold feet. Without a reversal in price, gas production is guaranteed to decline. The gas gold rush is over Indeed, Berman concludes that “the gold rush is over at least for now with the less commercial shale plays.” Within the major producing areas of the U.S., which account for 75 percent of production, all except Louisiana have been either flat or declining in recent years. Overall, he sees evidence that 80 percent of existing U.S. shale gas plays are already approaching peak production. Rig counts have been falling, and major operators such as Chesapeake Energy and ConocoPhilips have announced slowdowns in drilling in the last month. The two major plays that do not show evidence of peaking yet are the newer ones: the Marcellus Shale in Pennsylvania and the Haynesville Shale in Louisiana. To see the influence of these two plays on overall production, compare the first chart below, which shows production from all shale plays, to the second, which removes production from those two plays: Source: Arthur Berman Source: Chart by Chris Nelder, from Arthur Berman’s worksheets The Haynesville surpassed the Barnett Shale in Texas last year as the top-producing shale play in the U.S., but it may be reaching a production plateau now. Worse, Berman’s analysis finds that despite its impressive production, the Haynesville is among the least economic of the shale plays, requiring gas prices above $7.00 per thousand cubic feet to sustain new drilling profitably, and nearly $9.00 per thousand cubic feet after accounting for leasing and other costs. (One thousand cubic feet is roughly equivalent to one million BTU.) A word of caution is in order here: A one-year decline in production in an unprofitable environment is not proof that shale gas has “peaked.” It’s certainly possible that renewed drilling could bring higher production when gas prices rise again. The operative question in that case is when. If gas prices recover within the next year or two, it will be relatively easy to bring new wells online rapidly. But if gas prices languish for longer than that, the most productive “core” areas of the plays could become exhausted because the wells deplete so quickly. Without sustained new drilling to replace their production, by the time producers begin drilling again in the remaining, less productive prospects, an air pocket could form in the supply line. Disinformation and diffusion theory Berman admits that it’s strange for his bottom-up analysis to produce results that are so wildly divergent from the claims of the operators and the data offered by the EIA. “I ask myself: Where could we be wrong?” he explained. “We’ve looked at the individual wells and it looks like they’ll produce less gas than the operators say, so where could we be wrong? Likewise on cost: There are no retained earnings, so how could they be saying they’re profitable?” Having scrutinized the financial reports of operators, Berman concludes that operators are being honest with the SEC, because if they aren’t, somebody will go to jail. But then they’re telling a very different story to the public, and to investors, particularly regarding their costs. This isn’t necessarily nefarious; it’s really just a way of working around the natural risks associated with new resource development. They’re playing for the future, not for immediate profitability. Early wildcatters gambled on debt-fueled drilling with the hope that they’d be able to hold the leases long enough to see prices rise again and put them nicely in the black, or flip them at a profit to someone who could. And the profit picture is substantial: according to the Range Resources presentation, when gas is $6, they’ll be realizing a 135 percent internal rate of return. “I think these companies realize—clearly—that the U.S. is moving toward a gas economy,” Berman observes. “The natural gas industry has been very successful at screwing up the coal industry. . . a huge part of the demand is from the power generation business. The President now thinks, incorrectly, that we’ve got 100 years of natural gas. [Op’erators think] ‘If we can just get all this land held, drilled, etc., then in a couple of years when the price recovers we’re going to make a fortune’. . . and they’re right!” I am inclined to agree. My own analysis suggests that [gas is trouncing coal](http://www.smartplanet.com/blog/energy-futurist/regulation-and-the-decline-of-coal-power/275) in the power generation sector. I am also strongly [against exporting LNG](http://www.smartplanet.com/blog/energy-futurist/the-siren-song-of-lng-exports/313), because it will increase domestic costs across the board, another point on which Berman and I agree. “If they go through with the permits to export LNG, then that’s gonna seal it,” he remarked. “All you have to do is commit to 20-year contracts to ship a few bcf per day. . . I fear what’s really going to happen is that we’re going to have to start importing LNG.” Ultimately, we have to ask why there seems to be such an enormous disconnect between the reality of the production and reserve data, and the wild-eyed claims of operators and politicians. Berman’s answer is blunt: “We’re in a weird place where it’s not in anybody’s vested interest to say that things aren’t wonderful,” he said, and went on to relate a few stories of his encounters with politicians. They admitted to him, straight-up, that they can’t tell the public the truth about energy issues like gas reserves and peak oil because nobody wants to hear it, and they’ll just wind up getting voted out of office. “This gets back to basic diffusion theory,” Berman muses, “where only 5 percent of people base their decisions on information, while the other 95 percent make decisions on what everybody else thinks.” That sounds right to me. It benefits everyone involved to tell happy lies, and benefits no one to own up to the current reality. That is true for everyone from the operators right on up to the President. Perhaps in the end—like government—we’ll simply get the energy policy we deserve.

### AT: Hypocrisy – Other Countries Disprove

#### This is stupid – every other country has violated the NPT more

**Ford 9** [“Nuclear Disarmament, ¶ Nonproliferation, ¶ and the “Credibility ¶ Thesis”, Christopher Ford, September 2009, senior fellow and director of the Center for Technology and ¶ Global Security at Hudson Institute¶ U.S. special representative for ¶ nuclear nonproliferation¶ principal deputy assistant ¶ secretary of state for verification, compliance]

Inconveniently for proponents of the credibility thesis, the truth seems to be that ¶ the United States has, for some time, been arguably the most serious about disarmament ¶ of the five NPT nuclear weapons states—or at least, perhaps more accurately, the least¶ serious of the five about its nuclear weaponry. After all, the United States today is the ¶ only NWS that is not building new and more modern strategic nuclear delivery systems ¶ or new nuclear weapons. The British, French, Russians, and Chinese are all building new ¶ ballistic missile submarines, while the Russians and Chinese are also building new landbased mobile missiles. The Russians are working hard on new warhead designs, ¶ apparently in part through the use of secret low-yield nuclear testing, in violation of their ¶ own proclaimed testing moratorium, and have developed a chillingly nuclear-friendly ¶ strategic doctrine that envisions the early and liberal use of nuclear weaponry (including 19 so-called “tactical” devices) in a range of warfighting scenarios, by no means limited to ¶ situations of nuclear threat or attack. China, for its part, despite decades of disarmament ¶ rhetoric, may also be conducting such secret low-yield tests, and is certainly—and ¶ uniquely, among the five—increasing the overall size of its nuclear arsenal. Even the ¶ ostentatiously disarmament-friendly British, in addition to building their new class of ¶ ballistic missile submarines, will likely soon need to build new warheads to tip the ¶ missiles they will deploy aboard these new vessels. ¶ ¶ 6¶ The alternative, after all, might be fatal to the cause of disarmament: it would be perverse indeed ¶ to insist that in order to achieve “real” disarmament, countries must relinquish nuclear weapons ¶ only when doing so would be against their national interests. Who would agree to such terms? ¶ Page 5 of ¶ Yet Washington has now abandoned its plans even to study the possibility of ¶ replacing existing warheads with a new model designed not to need underground nuclear ¶ testing, and has stopped its program to build a follow-on to the B-2 Spirit (a.k.a. ¶ “Stealth”) bomber. The United States is also the only power in the world to have a ¶ credible chance of replacing with sophisticated long-range conventional capabilities ¶ many missions that could previously only be accomplished with the relatively crude ¶ hammer blow of a nuclear weapon. Washington has for some years gradually been ¶ reducing, rather than increasing, the salience of nuclear weapons in its strategic posture.¶ 7¶ The United States’ continued possession of a sizeable (if shrinking) arsenal should not ¶ blind observers to the remarkable degree to which nuclear weaponry is no longer ¶ particularly relevant in U.S. thinking, and to which the United States seems ever more ¶ uninterested in its own nuclear capabilities.

### Solvency – AT: Export Restrictions

#### Export reform solves

Glasgow, October 12 [Partner, Pillsbury Winthrop Shaw Pittman LLP on Behalf of the *Nuclear* Energy Institute.NUCLEAR EXPORT CONTROLS A Comparative Analysis of National Regimes for the Control of Nuclear Materials, Components and Technology, <http://www.jdsupra.com/legalnews/nuclear-export-controls-a-comparative-87814/>]

The Obama Administration has recognized that the complexity of the archaic U.S. export control system often defeats its own purposes to facilitate legitimate trade with partners and prevent the diversion of sensitive technologies from intended users. In remarks on the U.S. export control system made on April 20, 2010, to the Business Executives for National Security, then-Secretary of Defense Robert Gates stated: The problem we face is that the current system, which has not been significantly altered since the end of the Cold War, originated and evolved in a very different era with a very different array of concerns in mind. … The current arrangement fails at the critical task of preventing harmful exports while facilitating useful ones. Following Secretary Gates’ remarks, the Administration launched the Export Control Reform (ECR) Initiative, with a stated objective of fundamentally reforming the U.S. export control system. The cornerstone of the ECR Initiative is to rebuild the two U.S. export control lists: the CCL, which forms part of the Export Administration Regulations, and the ITAR’s U.S. Munitions List. The ECR Initiative’s goal is to create a single control list, single licensing agency, unified information technology system, and enforcement coordination center.26

#### And, cost competition key

Rosner, 11 [Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S, Robert Rosner and Stephen Goldberg Energy Policy Institute at Chicago The Harris School of Public Policy Studies Contributor: Joseph S. Hezir, Principal, EOP Foundation, Inc. Technical Paper, Revision 1 November, 2011, <https://epic.sites.uchicago.edu/sites/epic.uchicago.edu/files/uploads/EPICSMRWhitePaperFinalcopy.pdf>]

Previous studies have documented the potential for a significant export market for U.S. SMRs, mainly in lesser developed countries that do not have the demand or infrastructure to accommodate GW-scale LWRs. Clearly, the economics of SMR deployment depends not only on the cost of SMR modules, but also on the substantial upgrades in all facets of infrastructure requirements, particularly in the safety and security areas, that would have to be made, and as exemplified by the ongoing efforts in this direction by the United Arab Emirates (and, in particular, by Abu Dhabi). This is a substantial undertaking for these less developed countries. Thus, such applications may be an attractive market opportunity for FOAK SMR plants, even if the cost of such plants may not have yet achieved all of the learning benefits.

#### If we answered licensing, we answered this argument

**NRC 12** [“Export-Import”, United States Nuclear Regulatory Commission, March 29, 2012, <http://www.nrc.gov/about-nrc/ip/export-import.html>]

The commodities under NRC export licensing authority (10 CFR 110.8 and 110.9) include the following:

nuclear reactors (10 CFR 110 Appendix A)

uranium enrichment facilities (10 CFR 110 Appendices B-H)

spent fuel reprocessing plants (10 CFR 110 Appendix I)

uranium and plutonium conversion plants (10 CFR 110 Appendix J)

heavy water or deuterium production plants (10 CFR 110 Appendix K)

nuclear fuel fabrication plants (10 CFR 110 Appendix O)

lithium isotope separation facilities (10 CFR 110 Appendix N)

equipment, component parts, and assemblies that are especially designed or prepared for exclusive use in any of the aforementioned facilities

special nuclear material (e.g., plutonium, enriched uranium, uranium-233)

source material (e.g., natural and depleted uranium, thorium)

byproduct material (10 CFR 110 Appendix L and Appendix P)

deuterium (heavy water)

nuclear grade graphite for nuclear end use (see 70 FR 41937, July 21, 2005)

### 2AC Electricity Prices

#### Electricity prices will increase – natural gas – only nuke solves

**Powers, 11/8/12 -** editor of Powers Energy Investor, devoted the last 15 years to studying and analyzing the energy sector(Bill, Business Insider, “US Shale Gas Won't Last Ten Years: Bill Powers” <http://www.businessinsider.com/us-shale-gas-wont-last-ten-years-bill-powers-2012-11>)

Bill Powers: My thesis is that the importance of shale gas has been grossly overstated; the U.S. has nowhere close to a 100-year supply. This myth has been perpetuated by self-interested industry, media and politicians. Their mantra is that exploiting shale gas resources will promote untold economic growth, new jobs and lead us toward energy independence.

In the book, I take a very hard look at the facts. And I conclude that the U.S. has between a five- to seven-year supply of shale gas, and not 100 years. That is far lower than the rosy estimates put out by the U.S. Energy Information Administration and others. In the real world, many companies are taking write-downs of their reserves.

Importantly, I give examples of how certain people and institutions are promoting the shale gas myth even as they benefit from it economically. This book will change a lot of opinions about how large the shale gas resources really are in the U.S. and around the planet.

TER: How did you obtain your information?

BP: I spent three years doggedly researching this book. Most of the information came from publicly available sources. I used a fair amount of work done by Art Berman, who has written the forward for the book. Art is a leading expert on determining the productivity of shale gas plays. I contacted a lot of other geologists and petroleum engineering professionals and had them review my conclusions about declining production.

Put simply: There is production decline in the Haynesville and Barnett shales. Output is declining in the Woodford Shale in Oklahoma. Some of the older shale plays, such as the Fayetteville Shale, are starting to roll over. As these shale plays reverse direction and the Marcellus Shale slows down its production growth, overall U.S. production will fall. At the same time, Canadian production is falling. And Canada has historically been the main natural gas import source for the U.S. In fact, Canada has already experienced a significant decline in gas production—about 25%, since a peak in 2002—and has dramatically slowed its exports to the United States.

TER: What does this mean for investors?

BP: The decline is a set-up for a gas crisis, a supply crunch that will lead to much higher prices similar to what we saw in the 1970s.

Interestingly, during the lead-up to that crisis, the gas industry mounted a significant advertising campaign trumpeting the theme, "There's plenty of gas!" Now, it is true that there was a huge ramp-up for gas during the post-World War II period that lasted through the late 1960s as demand for gas for the U.S. manufacturing base grew rapidly. But we hit a production peak in the early 1970s during a time of rapidly growing demand. This led to a huge spike in prices that lasted until 1984.

It was very difficult to destroy demand, so the crisis was resolved by building hundreds of coal-fired power plants and dozens of nuclear power plants. But today, gas-fired plants are popular as we try to turn away from coal. This time around, those options are no longer available. Nuclear plants are still an option, but the time and money involved in keeping our aging nuclear power plant fleet operational, let alone building new plants, will be quite significant.

TER: How will the contraction of the natural gas supply affect its price?

BP: We will see a new equilibrium price for gas at much higher levels than the present. I vehemently disagree with industry observers who say that the U.S. is the next big exporter of liquefied natural gas (LNG). I believe that the U.S. will soon be increasing LNG imports, and that U.S. prices will move back to world levels.

We are currently seeing between $13 per thousand cubic feet (Mcf) and $15/Mcf in South America as Brazil and Argentina import LNG. We're seeing $17/Mcf in Japan and similar prices in Korea. The only place that is not increasing its LNG imports right now is Europe, and that is being made up for by increasing demand in Asia.

#### Intermittency and land ensure only nuclear can solve stable electricity

**Loudermilk 11** Micah J. Loudermilk, Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University, 5/31/11, Small Nuclear Reactors and US Energy Security: Concepts, Capabilities, and Costs, www.ensec.org/index.php?option=com\_content&view=article&id=314:small-nuclear-reactors-and-us-energy-security-concepts-capabilities-and-costs&catid=116:content0411&Itemid=375

When discussing the energy security contributions offered by small nuclear reactors, it is not enough to simply compare them with existing nuclear technology, but also to examine how they measure up against other electricity generation alternatives—renewable energy technologies and fossil fuels. Coal, natural gas, and oil currently account for 45%, 23% and 1% respectively of US electricity generation sources. Hydroelectric power accounts for 7%, and other renewable power sources for 4%. These ratios are critical to remember because idealistic visions of providing for US energy security are not as useful as realistic ones balancing the role played by fossil fuels, nuclear power, and renewable energy sources. Limitations of renewables Renewable energy technologies have made great strides forward during the last decade. In an increasingly carbon emissions and greenhouse gas (GHG) aware global commons, the appeal of solar, wind, and other alternative energy sources is strong, and many countries are moving to increase their renewable electricity generation. However, despite massive expansion on this front, renewable sources struggle to keep pace with increasing demand, to say nothing of decreasing the amount of energy obtained from other sources. The continual problem with solar and wind power is that, lacking efficient energy storage mechanisms, it is difficult to contribute to baseload power demands. Due to the intermittent nature of their energy production, which often does not line up with peak demand usage, electricity grids can only handle a limited amount of renewable energy sources—a situation which Germany is now encountering. Simply put, **nuclear** power **provides virtually carbon-free baseload power generation, and renewable options are unable to replicate this, especially not on the scale required by expanding global energy demands**. Small nuclear reactors, however, like renewable sources, can provide enhanced, distributed, and localized power generation. As the US moves towards embracing smart grid technologies, power production at this level becomes a critical piece of the puzzle. Especially since renewable sources, due to sprawl, are of limited utility near crowded population centers, small reactors may in fact prove instrumental to enabling the smart grid to become a reality.

#### Manufacturing down now and nuclear solves

**Adams ’10** (Rod Adams. Naval War College diploma in National Policy and Strategy (with highest honors) May 2003 - GPA 4.0, Pro-nuclear advocate with small nuclear plant operating and design experience. Former submarine Engineer Officer. Founder, Adams Atomic Engines, Inc. Host and producer, The Atomic Show Podcast, “Nuclear Industry Can Lead a Revival in Skilled Labor and Manufacturing in the United States”, <http://atomicinsights.com/2010/11/nuclear-industry-can-lead-a-revival-in-skilled-labor-and-manufacturing-in-the-united-states.html>, November 15, 2010, LEQ)

The Nuclear Energy Institute, the American Nuclear Society and the North American Young Generation in Nuclear have been investing time and money into focused workforce development programs for several years. The people leading the effort are taking the action to ensure that there are educated and trained people who are ready to meet the challenge of continuing to reliably operate and maintain our existing fleet of 104 nuclear reactors at the same time that we are reestablishing our nuclear plant manufacturing and construction industry. In 1950 manufacturing accounted for more than 30 percent of all U.S. employment. These skilled labor careers provided an unprecedented standard of living for more than two decades following the end of World War II, allowing millions of Americans to purchase homes and autos and pay for their children to go to college. By 2006, manufacturing employment shrunk to a mere 10 percent of U.S. employment and with it the **bulk** of America’s well-paying **skilled labor careers**. **Prognosticators predicted manufacturing’s ultimate demise as a significant driver of the American economy**. But a look at the U.S. nuclear industry tells a different story: a narrative where job growth in the skilled trades is on an upward trend **and the industry can serve as a role model for the revitalization of the U.S. manufacturing sector through the creation of new careers and economic expansion.** In fact, it already has.

#### Electricity prices have skyrocketed – 5 year trends towards renewables proves

Daniel Simmons (director of state affairs at the Institute for Energy Research) May 17, 2012 “The Democrats' Plan to Jack Up Electricity Prices” http://www.usnews.com/opinion/blogs/on-energy/2012/05/17/the-democrats-plan-to-jack-up-electricity-prices

It is difficult to understand why some people want to see electricity prices increase even more. According to the USA TODAY, household electricity bills have "skyrocketed" the past five years adding about $300 to the yearly household electricity costs. With an economy that continues to struggle, you would think that politicians would be feverishly working to lower electricity prices, but instead many are working to further increase prices. The latest example is Democratic Sen. Jeff Bingaman's proposed "Clean Energy Standard." According to a recent study by the Energy Information Administration, the analytical arm of the Department of Energy, Senator Bingaman's plan would increase electricity prices by 18 percent by 2035. Senator Bingaman's proposal would require 24 percent of electricity generation in 2015 to be from "clean" sources, increasing to 84 percent by 2035. But the bill has a truly bizarre definition of what is "clean." For example, hydroelectric and nuclear plants placed in service before 1992 do not get full credit for being "clean," but hydroelectric and nuclear plants placed in service after 1991 are "clean." Only in Washington, D.C. would a hydroelectric plant only be considered "clean" if it placed in service in 1992, but not in 1991. [See a collection of political cartoons on energy policy.] Most people think of "clean energy" as energy that produces low amounts of pollution such as soot or toxic chemicals, but Senator Bingman's proposal does not concern itself with actual dirtiness. Instead, the bill defines "clean" only based on how much carbon dioxide a power plant emits. This is strange because carbon dioxide itself is not dirty—it is an odorless, colorless gas that is not toxic until carbon dioxide concentrations are many times higher than in the atmosphere. This "clean" energy standard is designed to reduce the amount of electricity generation from coal-fired power plants and replace it with higher-cost sources of electricity. This is why the Clean Energy Standard and other renewable energy mandates increase the costs of electricity. [Read the U.S. News debate: Should the Government Invest in Green Energy?] The supposed need for a Clean Energy Standard is even more puzzling when one considers the abundance of affordable energy resources we have at our disposal. In fact, the United States has the world's largest supply of coal—enough coal to satisfy our needs for at least the next 500 years. Instead of working to increase the price of electricity, it's about time policymakers work on reducing energy prices. But sadly, time after time,

#### Federal loan guarantees boost the economy in the short term.

**Zawatsky, ‘8**

[Jay, chief executive officer -- havePower, LLC, 4-9, The National Interest, “Inside Track: Going Nuclear on Energy,” <http://www.nationalinterest.org/PrinterFriendly.aspx?id=17332>]

How much does this all cost? Less than you would think. Far from breaking the bank, it will actually enrich the treasury. The cost to build it all is $3 trillion over ten years. But, no worries: Establish a federal lending institution, along the lines of Freddie Mac or Fannie Mae, to create a secondary market for revenue-based loans originated by existing commercial lenders to the utilities and the hydrogen retailers. Money would flow into these loans from all around the world, because they would be backed by physical plant and equipment producing the world’s most important commodity, power. Money flowing into the United States would stabilize the free-falling dollar. Interest rates would go down. This would make us all richer to boot, as the stock market (in which most people have a substantial portion of their retirement savings), reacting to lower budget deficits, lower interest rates and energy security, would move higher in a sustainable way.

#### No econ impact

Robert Jervis 11, Professor in the Department of Political Science and School of International and Public Affairs at Columbia University, December 2011, “Force in Our Times,” Survival, Vol. 25, No. 4, p. 403-425

Even if war is still seen as evil, the security community could be dissolved if severe conflicts of interest were to arise. Could the more peaceful world generate new interests that would bring the members of the community into sharp disputes? 45 A zero-sum sense of status would be one example, perhaps linked to a steep rise in nationalism. More likely would be a worsening of the current economic difficulties, which could itself produce greater nationalism, undermine democracy and bring back old-fashioned beggar-my-neighbor economic policies. While these dangers are real, it is hard to believe that the conflicts could be great enough to lead the members of the community to contemplate fighting each other. It is not so much that economic interdependence has proceeded to the point where it could not be reversed – states that were more internally interdependent than anything seen internationally have fought bloody civil wars. Rather it is that even if the more extreme versions of free trade and economic liberalism become discredited, it is hard to see how without building on a preexisting high level of political conflict leaders and mass opinion would come to believe that their countries could prosper by impoverishing or even attacking others. Is it possible that problems will not only become severe, but that people will entertain the thought that they have to be solved by war? While a pessimist could note that this argument does not appear as outlandish as it did before the financial crisis, an optimist could reply (correctly, in my view) that the very fact that we have seen such a sharp economic down-turn without anyone suggesting that force of arms is the solution shows that even if bad times bring about greater economic conflict, it will not make war thinkable.

#### The economy is resilient

**Economist,** Economist Intelligence Unit – Global Forecasting Service, 11/16/’**11**

(<http://gfs.eiu.com/Article.aspx?articleType=gef&articleId=668596451&secID=7>)

The US economy, by any standard, remains weak, and consumer and business sentiment are close to 2009 lows. That said, the economy has been surprisingly resilient in the face of so many shocks. US real GDP expanded by a relatively robust 2.5% in the third quarter of 2011, twice the rate of the previous quarter. Consumer spending rose by 2.4%, which is impressive given that real incomes dropped during the quarter (the savings rate fell, which helps to explain the anomaly.) Historically, US consumers have been willing to spend even in difficult times. Before the 2008-09 slump, personal spending rose in every quarter between 1992 and 2007. That resilience is again in evidence: retail sales in September were at a seven-month high, and sales at chain stores have been strong. Business investment has been even more buoyant: it expanded in the third quarter by an impressive 16.3% at an annual rate, and spending by companies in September on conventional capital goods (that is, excluding defence and aircraft) grew by the most since March. This has been made possible, in part, by strong corporate profits. According to data compiled by Bloomberg, earnings for US companies in the S&P 500 rose by 24% year on year in the third quarter. All of this has occurred despite a debilitating fiscal debate in Washington, a sovereign debt downgrade by a major ratings agency and exceptional volatility in capital markets. This reinforces our view that the US economy, although weak, is not in danger of falling into a recession (absent a shock from the euro zone). US growth will, however, continue to be held back by a weak labour market—the unemployment rate has been at or above 9% for 28 of the last 30 months—and by a moribund housing market.

#### There in so such thing as the global economy—economic links are regional

**Fletcher 2010** – Adjunct Fellow at the San Francisco office of the U.S. Business and Industry Council (7/7, Ian, Huffington Post, “The myth of the global economy”, http://www.huffingtonpost.com/ian-fletcher/the-myth-of-the-global-ec\_b\_638546.html, props to Mustafa for the cite, WEA)

If there's one thing everyone knows these days, whether they're happy about it or not, it's that we live in a "global" economy. This fact is taken as so obvious that anyone who disputes it is regarded as not so much wrong as simply ignorant -- not even worth arguing with. So it may come as a shock to many that, in reality, the cliche that we live in a borderless global economy does not survive serious examination. The key is to ignore the Thomas Friedmanesque rhetoric the media is flooded with and get down to some hard numbers. The easiest hard number is this: Because the U.S. is roughly 25 percent of the world economy, a truly borderless world would imply that imports and exports would each make up 75 percent of our economy, since our purchase and sale transactions would be distributed around the world. This would entail a total trade level (imports plus exports) of 150 percent of GDP. Instead, our total trade level is 29 percent: imports are 17 percent and exports 12 percent. So our economy is nowhere near borderless. Furthermore, as our trade is almost certainly destined to be balanced by import contraction, rather than an export boom, in the next few years, our trade level is almost certainly poised to go down, not up. So unless the U.S. can somehow magically find a way to keep sucking in $300 to $700 billion a year in imports it doesn't pay for with exports, America in a few years will be importing significantly less and will be a less globalized economy. A truly unified world economy would also mean that rates of interest and profit would have to be equal everywhere--because if they weren't, the differences would be arbitraged away by the financial markets. But this is nowhere near being the case: Interest rates and corporate profits vary widely around the world. Economists James Anderson and Eric van Wincoop have calculated that the average cost of international trade (ignoring tariffs) is the equivalent of a 170 percent tariff. Even between adjacent and similar nations like the U.S. and Canada, national borders still count: Canadian economist John McCallum has documented that trade between Canadian provinces is on average 20 times as large as the corresponding trade between Canadian provinces and American states. And much of international trade is interregional anyway, not global, being centered on European, North American, and East Asian blocs; this is true for just under 50 percent of both agriculture and manufactured goods. In reality, the world economy remains what it has been for a very long time: a thin crust of genuinely global economy (more visible than its true size due to its concentration in media, finance, technology, and luxury goods) over a network of regionally-linked national economies, over vast sectors of every economy that are not internationally traded at all (70 percent of the U.S. economy, for example). On present trends, it will remain roughly this way for the rest of our lives. The world economy in the early 21st century is not even remotely borderless. Another stubborn reality is that, contrary to what some people seem to think, the nation-state is a long way from being economically irrelevant. Most fundamentally, it remains relevant to people because most people still live in the nation where they were born, which means that their economic fortunes depend upon wage and consumption levels within that one society. Unemployed Americans are learning this the hard way right now. Capital is a similar story. Even in the early 21st century, it hasn't been globalized nearly as much as often imagined. And it also cares very much about where it lives, frequently for the same reasons people do. (Few people wish to live or invest in Zimbabwe; many people wish to live and invest in California.) For a start, because 70 percent of America's capital is human capital, a lot of capital behaves exactly as people do, simply because it is people. Another 12 percent has been estimated by the World Bank to be social capital, the value of institutions and knowledge not assignable to individuals. So although liquid financial capital can indeed flash around the world in the blink of an electronic eye, this is only a fraction (under 10 percent) of any developed nation's capital stock. Even most nonhuman capital resides in things like real estate, infrastructure, physical plant, and types of financial capital that don't flow overseas -- or don't flow very much. (Economists call this "don't flow very much" phenomenon home bias, and it is well documented.) As a result, the output produced by all this capital is still largely tied to particular nations. So although capital mobility certainly causes big problems of its own, it is nowhere near big enough to literally abolish the nation-state as an economic unit. Will it do so one day? Even this is unlikely. Even where famously dematerializing and globalizing assets, like fiber optic telecom lines, are added -- assets that supposedly make physical location irrelevant--they are still largely being added where existing agglomerations of capital are. For example, although fiber optic backbones have gone into places like Bangalore, India, which were not global economic centers a generation ago, big increments of capacity have also gone into places like Manhattan, Tokyo, Silicon Valley, and Hong Kong, which were already important. As a result, existing geographic agglomerations of capital are largely self-reinforcing and here to stay, even if new ones come into being in unexpected places (often through decisions made by national governments). And these agglomerations have national shape because of past history; legacy effects can be extremely durable. Previous technological revolutions, such as the worldwide spread of railroads, were at least as big as current innovations like the Internet, and they didn't abolish the nation-state. Ironically, the enduring relevance of the national economy is clearest in some of the "poster child" countries of globalization, like Japan, Taiwan, South Korea, Singapore, and Ireland. In each of these nations, economic success was the product of policies enacted by governments that were in some sense nationalist. Japan industrialized after the Meiji Restoration of 1868 to avoid being colonized by some Western power. Taiwan did it out of fear of mainland China. South Korea did it out of fear of North Korea. Ireland did it to escape economic domination by England. In each case, the driving force was not simply desire for profit. This exists in every society (including resource-rich basket cases like Nigeria, where it merely produces gangsterism), but does not reliably crystallize into the policies needed for economic growth. The driving force was national political needs that found a solution in economic development.

### 2AC QER CP

#### Agent counterplans are a voting issue for deterrence – they kill aff ground and shift the debate to a focus on implementation – it is impossible to defend every aspect of our agent. It also kills topic education because the literature base isn’t deep enough for a year’s worth of agent debates.

#### Permutation – do both

**Permutation – do the counterplan**

**Permutation – [do cp text]**

#### No implementation

Barlas, ‘12

[Stephen, Financial Executive Magazine, Jan/Feb, “Does the U.S. Really Need An Energy Policy?” http://wa-dcwriter.blogspot.com/2012/01/does-us-really-need-energy-policy.html]

But it is highly unlikely that Obama's Blueprint will lead to a firmer footing for U.S. energy security than past Blueprints from other presidents, or, perhaps more importantly, whether a Blueprint is even necessary. Obama's Blueprint policy is a loosely knit set of policies which focus on producing more oil at home and reducing dependence on foreign oil by developing cleaner alternative fuels and greater efficiency. The Blueprint is not the result of any particular deep thinking or strategy. The President's Council of Advisors on Science and Technology (PCAST) called for the development of such a strategy in its November 2010 Report to the President on Accelerating the Pace of Change in Energy Technologies Through an Integrated Federal Energy Policy. The PCAST called for a Quadrennial Technology Review (QTR) as the first step in preparing a Quadrennial Energy Review. The DOE completed the QTR in November 2011, six months after Obama published his Blueprint. Steven E. Koonin, Under Secretary for Science, DOE, says the QTR is limited in scope and all the DOE felt it could get done given budget and time. "Technology development absent an understanding and shaping of policy and market context in which it gets deployed is not a productive exercise," he states. At this point there is no indication that the DOE will even undertake the much more important QER, much less complete it any time soon. The larger reality is that any energy independence plan proposed by any U.S. President--whether based on a QER or not--has as much a chance of coming to fruition as Washington's hapless Redskins have of getting into the Super Bowl. In any case, the rhetoric of President after President aside, maybe the U.S. doesn't even need an energy independence or energy security policy. The biggest energy input for industrial and commercial business users is natural gas. Natural gas prices are incredibly important, both because the fuel is used directly to run industrial processes, heat facilities and commercial buildings, and make products such as fertilizers, pharmaceuticals, plastics and other advanced materials. Thanks to the Shale Revolution, the Energy Information Administration (EIA) forecasts natural gas prices will stay low for the foreseeable future, rising to $4.66 m/BTU in 2015 and $5.05 m/BTU in 2020. That is good news for the owners of 15,000 to 17,000 industrial boilers in this country, most of which use natural gas (and many of those who still use coal are switching to natural gas). In addition, companies such as Dow Chemical are restarting operations at facilities idled during the recession, Bayer is in talks with companies interested in building new ethane crackers at its two industrial parks in West Virginia, and Chevron Phillips Chemical and LyondellBasell, are considering expanding operations in the U.S. Fracking has also had a much less remarked-upon effect on petroleum prices, which are important to businesses with transportation fleets. New oil sources are spurting from the Bakken and Eagles Ford shale plays. U.S. oil prices have fallen from $133.88 a barrel of Texas intermediate crude in June 2008 to $86.07 today. The EIA predicts oil prices will rise to $94.58/bbl in 2015 and $108.10/bbl in 2020. Beyond the flood of natural gas washing over them, U.S. companies are also benefitting from three decades of investments--most of which made without federal subsidies or support--into facility energy efficiency. Ralph Cavanagh, Co-Director, Energy Program, Natural Resources Defense Council, member of Electricity Advisory Board at the DOE, says the most important single solution for U.S. businesses worried about energy prices and energy access is aggressive energy efficiency. "Energy independence is the wrong issue," he says. "It is reducing the cost of energy services and improving energy security. "U.S. business has done a tremendous job in energy efficiency over the past three decades," he states. "It takes less than one-half of a unit of energy to create $1 of economic value than it did in 1973. Industry has done that by upgrading the efficiency of process equipment and upgrading lighting." Others may well argue that the U.S. needs, and has always needed, an energy policy, but one narrowly targeted. Kenneth B Medlock III, PhD, Deputy Director, Energy Forum, James A Baker III Institute for Public Policy at Rice University, notes that the DOE and the Gas Research Institute helped develop, with federal funding, the horizontal drilling (i.e. fracking) technology that Mitchell Energy (now a part of Devon Energy) pioneered. "Government ought to be focused on research & development," he states. He also is a supporter of loan guarantees to promote investment activity in frontier technologies, and argues that as long as there are more good bets than bad bets in that kind of portfolio, the funds committed in total are a good investment. But spectacular failures like Solyndra and other less publicized busts such as Beacon Power's Chapter 11 filing kill the prospect of any additional congressional funding for energy loan guarantees of any kind. That is true even when legislation has bi-partisan support, which is the case for the Energy Savings and Industrial Competitiveness Act of 2011 (S. 1000) which would, among other things, provide grants for a revolving loan program designed to develop energy-saving technologies for industrial and commercial use. The bill passed the Senate Energy Committee by a vote of 18-3 in July. However, the Congressional Budget Office has pegged the cost of the bill's provisions at $1.2 billion over five years. That is a serious barrier to passage. And in any case, even if it did pass, the bill would simply authorize funding. Congressional appropriations committees would have to approve the money as part of the DOE's budget, which would be highly unlikely, Solyndra aside, since similar programs authorized by the 2005 and 2007 energy bills are still begging for appropriations.

#### White House blocks recommendation solvency

**Kirsh 11** (Steven T. Kirsh, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, "Why Obama should meet Till," 9/28/11) http://bravenewclimate.com/2011/09/28/why-obama-should-meet-till/-http://bravenewclimate.com/2011/09/28/why-obama-should-meet-till/

If you delegate this to someone else, nothing will happen. Here’s why. Delegating this letter downward from the White House to someone in DOE to evaluate will result in inaction and no follow up. I know this from past attempts that have been made. It just gets lost and there is no follow up. Every time. The guys at DOE want to do it, but they know that they will get completely stopped by OMB and OSTP. Both Carol Browner and Steven Chu asked former DOE nuclear management what to do about nuclear waste. They were told that using fast reactors and reprocessing was the way to go. But nothing happened. So Chu has given up trying. According to knowledgeable sources, the White House has told DOE in no uncertain terms, “do not build anything nuclear in the US.” It’s not clear who is making these decisions, but many people believe it is being driven by Steven Fetter in OSTP.

#### Links to politics – energy action triggers unpopularity and their link scenario

#### Resolved government action key to certainty – counterplan isn’t a clear choice for investors

Deutch, ‘11

[John M., Massachusetts Institute of Technology, May, “An Energy Technology Corporation Will Improve the Federal Government’s Efforts to Accelerate Energy Innovation,” http://www.brookings.edu/~/media/Research/Files/Papers/2011/5/energy%20corporation%20deutch/05\_energy\_corporation\_deutch\_paper.PDF]

IDEAL CONDITIONS FOR SUCCESSFUL TECHNOLOGY DEMONSTRATION PROGRAMS There also are important conditions for realizing a successful technology demonstration program from a selected set of projects. I list the conditions that are desirable for a successful program and compare some of these conditions with the conditions that have existed in DOE’s past demonstration efforts. 1. A stable government energy policy—for example, a known greenhouse gas emissions charge—is needed. In the absence of stable policy, a demonstration program must be pursued either on the basis of existing policy or in anticipation of changed policy. In the latter case, the demonstration project is not commercially viable so government assistance is required. A national energy plan that sets a comprehensive framework also would be welcome. Certainty about tax provisions, subsidies, and regulation guide private investment decisions, and signal which technical advances will have and which will not have value in the future. The best example is the effect that the absence of a carbon emissions charge has on investment and technology development in low-carbon electricity generation: nuclear, solar, and coal with carbon capture and sequestration. Absent a carbon charge, there is little incentive for the private sector to make such investments. It might still be sensible for the DOE to finance a technology demonstration that is “out of the money” on a commercial basis, in the absence of a carbon policy, while providing information and realistic options to the private sector if and when the policy changes. 2. Clarity about the purpose of energy policy is also important. It is easy to have a single goal and complicated to have multiple goals, especially when the combination is intended to overwhelm any doubt about the virtue of the policy. Current energy policy seeks to advance several objectives: to encourage the transition from fossil to renewable energy sources, to reduce oil imports, to reduce carbon emissions, to create jobs, to improve U.S. international competitiveness for green technologies, and to lower the costs of energy for the consumer. Alternative policy goals will involve trade-offs. For example, a carbon charge will reduce emissions but also lift the cost of electricity for the consumer. Sound public policy requires clarity about the balance struck among the trade-offs resulting from different policy choices. Sound public policy also requires a comprehensive multiyear plan that describes how the interrelated energy policies will influence different energy sectors of the economy: transportation, power, industry/commercial, and residential. Such a plan will help guide private sector deployment and technology development investment decisions. Absent a stable plan, how should a utility decide whether to build a low-cost but high-carbon-emitting pulverized coal plant for electricity generation or a high-cost but largely carbon-free nuclear power plant? A disciplined and documented procedure is needed to select the portfolio of technology demonstration projects that are intended to provide options for private sector investment. There should be explicit criteria for selecting the projects—for example, prospects for reducing emissions, reducing oil imports, stimulating renewables, creating jobs, and improving competitiveness. To reiterate, a single objective—for example, reducing emissions—is simplest, but multiple objectives are the rule and require explicit weighting in the selection process. I believe the important criteria should be reducing external environmental cost, improving energy security, and lowering the cost of energy for the U.S. consumer. Job creation and competitiveness are broader economic objectives that are not unique to the energy sector.

#### No solvency advocate is a voting issue for deterrence - literature should determine theoretical legitimacy, it increases topic education, incentivizes research skills and ensures the chance for fair affirmative responses – research outweighs and is the core value of debate

#### Delay

PCAST, ‘10

[President’s Council of Advisors on Science and Technology, 11-10, “REPORT TO THE PRESIDENT ON

ACCELERATING THE PACE OF CHANGE IN ENERGY TECHNOLOGIES THROUGH AN INTEGRATED FEDERAL ENERGY POLICY,” http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-energy-tech-report.pdf]

Our most important recommendation is that the Administration establish a new process that can forge a more coordinated and robust Federal energy policy, a major piece of which is advancing energy innovation. Many Executive Branch agencies and departments must be engaged, with leadership from the Executive Office of the President. This is needed because “energy policy” is an amalgam, and often derivative, of policies for environment, competitiveness, security, finance, land use, and more. The President should establish a Quadrennial Energy Review (QER) process that will provide a multiyear roadmap that lays out an integrated view of short-, intermediate-, and long-term energy objectives; outlines legislative proposals to Congress; puts forward anticipated Executive actions coordinated across multiple agencies; and identifies resource requirements for the development and implementation of energy technologies. The Secretary of Energy should provide the Executive Secretariat for the QER. While the QER will be a product of the Administration, substantial input from the Congress, the energy industry, academia, NGOs, and the public at large will be essential to the process. A staged process should be implemented now so as to provide some elements of a QER during each of the next four years. We recommend that the Secretary of Energy prepare and implement a DOE-Quadrennial Energy Review, focused on energy technology innovation, as a component of the full interagency QER on a shorter timescale. The DOE-QER should include roadmaps for key energy technologies, an integrated plan for the involvement of the national laboratories in energy programs, portfolio assessments that lay out the optimal deployment of resources, identification, and projections of demonstration projects, and identification of funding needs for each technology. This QER will also be prepared with strong input from many sources inside and outside of the Administration including industry, business, state and local governments, non-governmental organizations, and consumers. A complete and integrated QER will take longer to mature. While a good start should be made in 2011, the full government-wide QER should be targeted for delivery in early 2015. PCAST encourages Congress to use the QER as a basis for a 4-year authorization process that guides annual appropriations. The Federal investment in energy research, development, demonstration, and deployment (RDD&D) is incommensurate with the objective of leadership in energy technology innovation. We recommend a substantial increase – to $16 billion per year – in Federal support for energy RDD&D. Given the difficulty of increasing appropriated funds to this level and the importance of “front-loading” the required investment to jump start innovation, we recommend an alternative approach. The President should engage the private sector and Congress so as to generate about $10 billion per year of additional RDD&D funding through new revenue streams. This increase will provide the U.S. with the potential to leapfrog to development and deployment of the advanced energy technologies that will define a robust 21st century energy system.

### Politics DA 2AC

#### No trade war or escalation

Costa 9-17-2010 Daniel “India cries wolf: new u.s. visa fees are consistent with international obligations” The Hill, Online

Although it appears now that India will hold off on filing a formal complaint to the WTO, at least until after the U.S.-India Trade Policy Forum later this month and President Obama’s visit to India in November (where the topic will be discussed bilaterally), the State Department is now reviewing the matter. Setting aside for now a discussion about the wisdom of using the new visa fees to further fortify a border that’s more secure than ever (instead of funding oversight and enforcement of visa programs) – I will outline a few good reasons why the Obama administration and Congress should not take these threats seriously. First, WTO rules do not dictate how its members can or should set immigration policies or fees. In fact, WTO law allows the U.S. to impose new fees and requirements, so long as they do not nullify or impair the benefits countries get from the U.S.’s commitments. Nothing prevents a country from “applying measures to regulate” people entering and staying in the country, “including those measures necessary to protect the integrity of…its borders.” This is exactly how the new fees work and what they aim to accomplish – they are processing fees which fund border protection and do not reduce the total number of H-1B visas granted or restrict L-1 use in any way. The fee amount, $2000 or $2250, is also reasonable (and even negligible), compared to the profits of these companies and the cost savings they get when hiring H-1B and L-1s. A representative of Infosys confirmed this when he stated he didn’t think the fees “will have any material impact on our financials,” in part because the “fee cost is a mere 0.4 percent of the cost and even doubling the fee will not make much of a difference.” NAASCOM, the trade group that represents Indian offshoring companies, estimates the total yearly cost to the companies will be $200-250 million. But using NAASCOM’s own estimates on how many visas they use, my calculations reveal that (even using the most liberal estimates), this number cannot be much higher than $100 million (although I predict the actual amount will be much lower), in an industry that grew 5.5 percent and generated $50 billion in revenue just this past year. Second, and most importantly, the new fees are not discriminatory, because they do not treat Indian companies any less favorably than American firms in a way that would put them at a competitive disadvantage in the marketplace. News coverage has made it seem that only Indian companies must pay the new fees – but this is incorrect. American companies must also pay them if they fall under the purview of the law, and some do: Cognizant (a major player in the industry, with a revenue forecast of $4.46 billion for 2010), Logic Planet (93 percent of its 95 employees have H-1Bs) and DVR Softek (90 percent of 50). Next, in terms of regulations affecting the use of temporary work visas and individual company composition, India has a credibility gap vis-à-vis the United States. Although any company in the U.S. (large or small) may have 100 percent of its workforce made up of temporary foreign workers on H-1B and L-1 visas, as I detailed in a previous report, India is much more restrictive. New Indian regulations passed in 2009 allow companies operating in India to have no more than one percent of their workers on “Employment visas,” the Indian equivalent of the H-1B and L-1, and that one percent cannot exceed a total of 20 employees.

#### Relations are resilient- visa policy won’t have an impact

Times of India ’10 9-11 “Roemer allays fears over Ohio outsourcing ban” Online

Chidambaram on Thursday also strongly condemned the plan of an American pastor to burn copies of holy Quran to mark the 9\11 attacks. Roemer said he conveyed to Chidambaram the US did not subscribe to the action of pastor Terry Jones, whose announcement sparked worldwide outrage. "I certainly expressed to Chidambaram that the US is strongly condemning any action to burn Quran. This is disruptive, divisive, disrespectful and also this does not represent American values in shape and form. The minister and I talked about this," he said. The ambassador said Indo-US relations have reached a new stage, which now includes counter-terrorism, green partnership, apart from trade and commerce. Referring to the outsourcing issue, Roemer said some similar actions from certain other states in the US — passing resolutions banning outsourcing in 2005 — also did not affect Indo-US relations.

#### **No impact to US-India relations**

Das 11 – Premvir, former Director General, Defence Planning Staff, and member of the National Security Advisory Board (May 1, 2011 <http://www.business-standard.com/india/news/premvir-das-indo-us-engagement-atcrossroads/434038/>)

For more substance to be given to the relationship, a larger overview of national interest is needed. If a multipolar Asia is what India wants and a unipolar continent is what China seeks, then the US becomes a very important factor in our calculus. Its interests in Asia are enormous and it cannot let China assume a hegemonic role. Without **‘using’ the US**, it is not possible for India to secure the Asia that it wants. On another plane, **none of its** global **aspirations** can be met without the proactive support of the US — seats in the Security Council, on the high table of world trade, in groups controlling nuclear technology or in several other multilateral forums, fall in this category. The real question is whether a close engagement impacts adversely our relations with other countries — for example, Russia, Iran and Myanmar, even China, our core interests in South Asia and, indeed our concerns vis-a-vis Pakistan. These cannot be easily brushed aside but close scrutiny will show that while all these are manageable by us, the larger canvas is not. In sum, close relations with the US are critical to India’s rise, first as an Asian power and then as a global player of consequence. If this is true, then defence cooperation between the two countries must be taken a few notches further. Its contours can be four-fold.

#### Obama XO’s have already poisoned the well

Joel Gehrke (Commentary writer for the Washington Examiner) January 3, 2013 “Obama unilaterally rewrites immigration law again” http://washingtonexaminer.com/obama-unilaterally-rewrites-immigration-law-again/article/2517460#.UOaJz3frorg

President Obama issued a rule yesterday through the Department of Homeland Security to put illegal immigrants who have United States citizens in their immediate families on the fast track to permanent legal status. “This final rule facilitates the legal immigration process and reduces the amount of time that U.S. citizens are separated from their immediate relatives who are in the process of obtaining an immigrant visa,” DHS Secretary Janet Napolitano said in a statement. The Illegal Immigration Reform and Immigrant Responsibility Act, which Bill Clinton signed in 1996 in order to deter illegal immigration, requires illegal immigrants who have overstayed their visa to leave the country while applying for a new one. “Someone who has overstayed a visa for more than six months is barred from reentering the U.S. for three years; those who overstay more than a year are barred for 10 years,” the Los Angeles Times explained yesterday. “The final rule establishes a process that allows certain individuals to apply for a provisional unlawful presence waiver before they depart the United States to attend immigrant visa interviews in their countries of origin,” DHS explained. This change would allow people to live in the United States while pursuing an immigrant visa, although they would still have to return to their original country to pick up that visa. “The change will have a significant impact on American families by greatly reducing the time family members are separated from those they rely upon,” United States Citizenship and Immigration Services Director Alejandro Mayorkas said in a statement. Even if the policy could have bipartisan support, the unilateral nature of the maneuver could complicate negotiations over changing immigration law. “If Obama continues to force his preferred policies on the country without discussion or legislation, and simply on the basis of his personal agenda, he is unlikely to find willing partners when it comes time for significant immigration action,” a Senate Republican aide told The Washington Examiner.

#### Immigration reform wont pass – GOP obstructionism and fiscal priorities

Ewen MacAskill (writer for The Guardian) January 4, 2013 “Wounded Boehner is re-elected as speaker” Lexis

But, crucially, the political make-up is largely unchanged. There are a few more Democrats and fewer Tea Party-backed Republicans, but essentially the balance remains the same, with the Democrats in control of the Senate and warring Republicans with a majority in the House. This Congress looks on course to be as unproductive as the last one, paralysed by the civil war being fought inside the Republican caucus in the House between the Tea Party-backed members and more moderate and pragmatic ones. Barack Obama has an ambitious second-term programme that includes immigration reform and gun control, but that could be put in jeopardy by looming battles over spending cuts and the debt ceiling, and the unwillingness of Republicans to work with the president.

#### Hagel will be nominated as defense secretary – confirmation process will be a huge fight

Chuck Todd (writer for ABC News) January 4, 2013 “Hagel likely to be nominated for Defense Secretary next week” http://firstread.nbcnews.com/\_news/2013/01/04/16353378-hagel-likely-to-be-nominated-for-defense-secretary-next-week?lite

Multiple sources on Capitol Hill and in key special-interest groups involved in national security issues say they have been told to be prepared for a Chuck Hagel nomination for Defense Secretary, either as early as Monday or perhaps more likely Tuesday of next week. Related: Former Sen. Chuck Hagel apologizes for gay comment While it's still possible for the president to have a change of heart, all signs are pointing to a Hagel nomination. That said, a White House spokesperson tells NBC News pretty emphatically that the president has not made a final decision and does not expect the president to make a final decision until he gets back from Hawaii. The White House spokesperson adds, the "chatter" about Hagel-as-the-pick in the national-security and Capitol Hill communities is "premature." That said this spokesperson acknowledged Hagel is a "leading contender." For what it's worth, the reason a lot of outside sources are being given a heads up on Hagel is that the White House knows if Hagel is indeed the president's choice, it's going to be a real fight. There are as many as 10 Democratic senators who could vote no, Capitol Hill sources say. But Hagel has some big backers besides the president who would become the key point people in getting Hagel over the finish line – Vice President Joe Biden and Rhode Island Sen. Jack Reed, both of whom are huge proponents of Hagel. Asked on MSNBC’s Morning Joe about the opposition to Hagel, Obama political adviser David Axelrod defended the former Republican Nebraska senator. “It speaks to the larger problem that we’re talking about, which is, we have to get the point, where, first of all, independence is admired and not discouraged, and we can disagree on some things and still work together on others,” Axelrod said. “And the notion that we demonize people because of a position that they’ve taken and disqualify them on that basis is what’s destroying the ability to get things done in this town.” Bottom line: It appears to be Hagel, but the White House says no final decision has been made.

#### Debt ceiling thumps immigration

Benjy Sarlin (writer for TPM, Talking Points Memo) January 3, 2013 “Debt Fight Threatens To Overshadow Obama’s Immigration Push” http://tpmdc.talkingpointsmemo.com/2013/01/debt-fight-threatens-to-overshadow-obamas-immigration-push.php

President Obama may be celebrating a victory on taxes over the House GOP this week, but the fiscal cliff agreement sets up an even nastier spending battle in the coming months, potentially complicating what was supposed to be his No. 1 legislative priority: immigration reform. Supporters of reform insist that Obama and Congress can walk and chew gum at the same time, especially given that the same demographic trends sending panicked Republicans to the negotiating table will persist. “There’s still a 2014 election scheduled,” Laura Vazquez, a legislative analyst for the National Council of La Raza, told TPM. “The president wants to move quickly with the momentum coming out of the election, which gives us a chance to get started very soon — as soon as the inauguration happens we’re ready to go.” Unfortunately for Obama and his reform allies, the fiscal cliff fight that dominated Washington’s attention since the election is only extended by the deal struck this week. Scheduled spending cuts to defense and domestic programs are postponed for two months, and Republicans are threatening a simultaneous standoff over the debt ceiling. As the president made clear in his statement announcing the fiscal cliff deal, every minute spent on these issues eats at his other priorities, a list that now includes gun control as well: “We can settle this debate, or at the very least, not allow it to be so all-consuming all the time that it stops us from meeting a host of other challenges that we face — creating jobs, boosting incomes, fixing our infrastructure, fixing our immigration system, protecting our planet from the harmful effects of climate change, boosting domestic energy production, protecting our kids from the horrors of gun violence.” Immigration advocates are still expecting big movement this month from the White House on comprehensive reform, especially in the president’s State of the Union address. With Republican leaders publicly calling for a debate on the issue before the 2014 elections in the hopes of winning over Latino voters, Obama still has his best shot yet at moving a bill through Congress. But there are still plenty of things that can derail reform efforts, some possibly exacerbated by an extended debate on taxes and spending. Republican presidential candidates are threatened by an energized Latino vote, but most members of Congress are in safe districts where their biggest threat is a conservative primary challenger. The closer the 2014 election season gets, the more skittish those Members could grow about taking difficult votes even as national party builders demand swift action. There may be some positive signs for immigration reform buried in the fiscal cliff fight as well. In order to pass the Senate’s tax bill, Speaker Boehner relied mostly on Democratic support, violating a Republican taboo against bringing items to the floor that the majority of the GOP caucus opposes. Given the very real possibility of a tea party revolt over immigration reform, he may need to do the same again to carry a comprehensive bill across the finish line. “Our guess is a bill worth supporting — that doesn’t mean a perfect one — that could make it out of a Republican House is likely going to have a similar makeup to the fiscal cliff vote,” Marshall Fitz, director of immigration policy at the Center for American Progress, told TPM. But there’s no guarantee that Boehner, whose hold on his conference is at the weakest of his tenure, will want to invite yet another GOP civil war to pass a White House priority loathed by a substantial portion of his members. If the debt ceiling talks widen the rift between him and the rank and file, immigration could become that much harder to advance. While Fitz suggested that immigration should be a much easier sell to the average Republican than violating a tax pledge, he expressed concern that moderates might lay low, leaving more restrictionist voices, like Iowa Rep. Steve King (R-IA), to rally opposition in conservative media.

#### Gun control and debt ceiling thump immigration

David Nakamura and Tara Bahrampour (writers for the Washington Post) January 3, 2013 “

White House pushes forward on immigration ahead of bigger reform fight” <http://www.washingtonpost.com/politics/white-house-seems-poised-to-retool-deportation-laws/2013/01/03/7cb52930-55db-11e2-8b9e-dd8773594efc_story.html>

Although Obama has pledged to push for comprehensive legislation early in his second term, the White House’s timetable has been complicated by the prospect of another round of fiscal negotiations over the debt ceiling in February and the president’s pledge to support a gun-control bill in the wake of the mass school shooting in Newtown, Conn. Both of those issues are likely to embroil the White House in bitter, time-consuming political battles with Republicans, particularly in the GOP-controlled House. Advocates said they are hopeful that Republicans will respond more favorably to immigration reform because the party is eager to broaden its appeal to minority groups in the wake of Obama’s election victory.

#### Nuclear power has tons of political support.

Koplow, ‘11

[Doug, founder of Earth Track, Inc., has worked on natural resource subsidy issues for more than 20 years, mainly in the energy sector, holds a B.A. in economics from Wesleyan University, M.B.A. from the Harvard Graduate School of Business Administration, Union of Concerned Scientists, February, “Nuclear Power: Still Not Viable Without Subsidies,” http://www.ucsusa.org/assets/documents/nuclear\_power/nuclear\_subsidies\_report.pdf]

The industry and its allies are now pressuring all levels of government for large new subsidies to support the construction and operation of a new generation of reactors and fuel-cycle facilities. The substantial political support the industry has attracted thus far rests largely on an uncritical acceptance of the industry’s economic claims and an incomplete understanding of the subsidies that made—and continue to make—the existing nuclear fleet possible.

#### PC not key

**Klein, 3/19/12** [The Unpersuaded Who listens to a President? by [Ezra Klein](http://www.newyorker.com/magazine/bios/ezra_klein/search?contributorName=ezra%20klein) March 19, 2012, Ezra Klein is the editor of Wonkblog and a columnist at the Washington Post, as well as a contributor to MSNBC and Bloomberghttp://www.newyorker.com/reporting/2012/03/19/120319fa\_fact\_klein#ixzz1p36PrMbH]

This, Edwards says, is the reality facing modern Presidents, and one they would do well to accommodate. “In a rational world, strategies for governing should match the opportunities to be exploited,” he writes. “Barack Obama is only **the latest** in a **long line** of presidents who have not been able to transform the political landscape **through** their efforts at **persuasion**. When he succeeded in achieving major change, it was by mobilizing those ***predisposed* to support** him and driving legislation through Congress on a party-line vote.”

That’s easier said than done. We don’t have a system of government set up for Presidents to drive legislation through Congress. Rather, we have a system that was designed to encourage division between the branches but to resist the formation of political parties. The parties formed anyway, and they now use the branches to compete with one another. Add in minority protections like the filibuster, and you have a system in which the job of the President is to persuade an opposition party that has both the incentive and the power to resist him.

Jim Cooper says, “We’ve effectively lost our Congress and gained a parliament.” He adds, “At least a Prime Minister is empowered to get things done,” but “we have the extreme polarization of a parliament, with party-line voting, without the empowered Prime Minister.” And you can’t solve that with a speech.

#### Winners win

**Halloron, 10** [Liz, National Public Radio, “For Obama what a difference a win will make”, <http://www.npr.org/templates/story/story.php?storyId=125594396>]

Amazing what a win in a **major legislative battle** will do for a president's spirit. (Turmoil over spending and leadership at the Republican National Committee over the past week, and the release Tuesday of a major new and largely sympathetic book about the president by New Yorker editor David Remnick, also haven't hurt White House efforts to drive its own, new narrative.) Obama's Story New Yorkereditor David Remnick has a new book out about Obama. Listen to an interview with Remnick and read a review. ['The Bridge': Remnick On The Ascent Of Obama](http://www.npr.org/templates/story/story.php?storyId=125595945&ps=rs) April 6, 2010 ['Bridge' Tells Obama's Story, Just As We Remember It](http://www.npr.org/templates/story/story.php?storyId=125093691&ps=rs) April 5, 2010 Though the president's national job approval ratings failed to get a boost by the passage of the health care overhaul — his numbers have remained steady this year at just under 50 percent — he has earned grudging respect even from those who don't agree with his policies. "He's achieved something that virtually everyone in Washington thought he couldn't," says Henry Olsen, vice president and director of the business-oriented American Enterprise Institute's National Research Initiative. "And that's given him confidence." The protracted health care battle looks to have taught the White House something about power, says presidential historian Gil Troy — a lesson that will inform Obama's pursuit of his initiatives going forward. "I think that Obama realizes that **presidential power is a muscle**, and the more you exercise it, the stronger it gets," Troy says. "He exercised that power and had a success with health care passage, and now he wants to make sure people realize it's not just a blip on the map." The White House now has an opportunity, he says, to change the narrative that had been looming — that the Democrats would lose big in the fall midterm elections, and that Obama was looking more like one-term President Jimmy Carter than two-termer Ronald Reagan, who also managed a difficult first-term legislative win and survived his party's bad showing in the midterms. Approval Ratings Obama is exuding confidence since the health care bill passed, but his approval ratings as of April 1 remain unchanged from the beginning of the year, according to [Pollster.com](http://www.pollster.com/polls/us/jobapproval-obama.php). What's more, just as many people disapprove of Obama's health care policy now as did so at the beginning of the year. According to the most recent numbers: Forty-eight percent of all Americans approve of Obama, and 47 disapprove. Fifty-two percent disapprove of Obama's health care policy, compared with 43 percent who approve. **Stepping Back From A Precipice** Those watching the re-emergent president in recent days say it's difficult to imagine that it was only weeks ago that Obama's domestic agenda had been given last rites, and pundits were preparing their pieces on a failed presidency. Obama himself had framed the health care debate as a referendum on his presidency. A loss would have "ruined the rest of his presidential term," says Darrell West, director of governance studies at the liberal-leaning Brookings Institution. "It would have made it difficult to address other issues and emboldened his critics to claim he was a failed president." The conventional wisdom in Washington after the Democrats lost their supermajority in the U.S. Senate when Republican Scott Brown won the Massachusetts seat long held by the late Sen. Edward Kennedy was that Obama would scale back his health care ambitions to get something passed. "I thought he was going to do what most presidents would have done — take two-thirds of a loaf and declare victory," says the AEI's Olsen. "But he doubled down and made it a vote of confidence on his presidency, parliamentary-style." "You've got to be impressed with an achievement like that," Olsen says. But Olsen is among those who argue that, long-term, Obama and his party would have been better served politically by an incremental approach to reworking the nation's health care system, something that may have been more palatable to independent voters Democrats will need in the fall. "He would have been able to show he was listening more, that he heard their concerns about the size and scope of this," Olsen says. **Muscling out a win** on a sweeping health care package may have invigorated the president and **provided evidence of leadership**, but, his critics say, it remains to be seen whether Obama and his party can reverse what the polls now suggest is a losing issue for them. **Golden Boy Tested** One of the questions that has trailed Obama is how he would deal with criticism and the prospect of failure, says Troy, a McGill University history professor and visiting scholar affiliated with the bipartisan Policy Center in Washington. "He is one of those golden boys who never failed in his life, and people like that are often not used to criticism and failure," Troy says. Obama and his campaign were temporarily knocked for a loop early in the 2008 presidential campaign by then-GOP vice presidential candidate Sarah Palin's "zingers," Troy says, "and Obama was thrown off balance again by the loss of the Massachusetts Senate seat." The arc of the health care debate reminded observers that Obama is not just a product of Harvard, but also of tough Chicago politics, Troy says. "You don't travel as far and as fast as Barack Obama without having a spine of steel," he says. "He has an ability to regenerate, to come back, and knows that there is no such thing as a dirty win: a win is a win" — even if it infuriates the progressive wing of the president's party, which wanted far more sweeping changes to the nation's health care system. **GOP Stumbles** Obama's new mojo has been abetted, in a way, by high-profile troubles at the Republican National Committee. RNC Chairman Michael Steele has been under fire over the past week for his spending on private jets and limousines, and a staffer resigned after submitting to the committee a nearly $2,000 tab for a visit by young party members to a risque Los Angeles nightclub. The disarray intensified Monday with the resignation of the committee's chief of staff, and growing anger among top GOP strategists and fundraisers. "Steele has kept Republicans off-message," says West, of Brookings. "Every story about RNC spending is one less story about their views on health care at a time when news coverage has shifted in a more favorable direction." The distraction continued Monday when detractors accused Steele of playing the race card after he told ABC News that as an African American, he, like Obama, is being held to a higher standard. White House Spokesman Robert Gibbs, when asked about Steele's assertion, said the RNC chairman's problem "isn't the race card, it's the credit card." The controversy, Olsen says, hasn't been good for the Republicans' preparations for elections in terms of money and organization. But he doesn't view it as "a voter issue." **How Win Translates** When Reagan won his tough legislative battle in the early 1980s, it was over tax cuts, something voters saw as directly related to the then-dismal economy. Obama has long made a case for health care reform as a big piece of economic reform, but it's a difficult argument to make to voters, Olsen says, particularly when many of the health care law's major provisions don't go into effect for another four years. But observers like Troy say they believe that though initially unrelated, a boost in employment among Americans would encourage voters to look more favorably on the health care overhauls. "The perceived success of health care legislation rides on job creation," Troy says. Economists have recently declared the nation's recession, which began in 2007, over. But the unemployment rate has remained stubbornly at just under 10 percent. "I think he understands he's in a crucial period of his presidency," Olsen says. "He's taken a lot of risks, and there's not immediate rewards." Obama faces continuing tests on other big domestic issues, including Wall Street reform, the economy and climate change, as well as myriad foreign policy challenges ranging from testy relations with Israel and uncertainties about Iran's nuclear capabilities, to wars in Iraq and Afghanistan. Late last month, the administration and Russia agreed to a new nuclear arms treaty that is expected to be signed Thursday in advance of an international summit in Washington. The world is waiting, Troy says, to see how the president's renewed confidence plays out on the international stage. But the newly invigorated president continues to encourage voters to wait and see what his efforts produce.

### 2AC Adv CP

Perm do both

Other countries

Links ptx and exports because causes more nuke power globally

#### Other countries say no and only the perm solves

**Tindale, 11** [Stephen Tindale is an associate fellow at the CER, June 2011, Center for European Reform, <http://www.cer.org.uk/sites/default/files/publications/attachments/pdf/2011/pb_thorium_june11-153.pdf>]

Reducing the risk of nuclear weapons proliferation A fourth anti-nuclear argument is that nuclear power stations are closely linked to nuclear weapons. The US built nuclear weapons before it constructed nuclear power stations, but since then every country that has acquired nuclear weapons (except Israel) did so by building nuclear power stations. So concerns about proliferation are a valid and forceful argument against nuclear power. One way to combine global expansion of nuclear power with stronger control on weapons proliferation would be to establish an international nuclear fuel bank. Nuclear fuel would be enriched at an internationally-controlled facility and supplied to different countries, with the spent fuel and plutonium then returned to that facility after the generation of electricity. This approach has been promoted by, among others, the Nuclear Threat Initiative, which includes among its leading participants former US secretaries of state Henry Kissinger and George Schultz, former US secretary of defense William Perry and former US senator Sam Nunn. However, **there is not yet any agreement on setting up such an international nuclear fuel bank**. An alternative, and more achievable, approach to combining nuclear power expansion with weapons proliferation control would be to promote thorium molten salt reactors instead of uranium solid fuel reactors. Some uranium solid fuel reactors require that the uranium is enriched. (Uranium in which the isotope U-235 is more than 20 per cent of the total is referred to as highly enriched unranium (HEU). HEU can be use for weapons, although the term ‘weaponsgrade material’ refers to uranium in which U-235 is 90 per cent. 30 countries use HEU in reactors. Modern uranium reactors can use low enriched uranium, in which U-235 is 3-4 per cent.) All uranium solid fuel reactors then produce plutonium. Thorium fuel does not require enrichment, and thorium molten salt reactors do not produce plutonium, so the threat of weapons proliferation would be substantially reduced. It would not, however, be removed completely. The thorium is transformed during the process into a form of uranium – U-233 – which could in theory be used in nuclear weapons. This has not yet been done, so thorium molten salt reactors represent a smaller proliferation risk than uranium hard fuel reactors do. However, the safest approach to proliferation prevention would be to combine development of molten salt reactors with the establishment of an **internationally-controlled** nuclear fuel bank.

#### Causes massive backlash

**Weiss 9** [Leonard Weiss, affiliated scholar at Stanford University's Center for International Security and Cooperation, “reliable energy supply and nonproliferation”, Nonproliferation Review, Vol. 16, No. 2, 2009]

The problem of global warming has fostered much talk of a ‘‘nuclear renaissance’’ as a response to the need to reduce carbon emissions. But it is a virtual certainty that increasing the spread of nuclear energy technology will result in an increased risk of nuclear weapons proliferation and nuclear terrorism. Schemes to mitigate this increased risk include internationalized nuclear fuel assurances for countries that forego national fuel cycle facilities, but fears of cartelization as well as states’ natural desire to control their energy destiny have made proposals such as those of Acheson-Lilienthal, INFA in the NNPA, and the more recent ones from ElBaradei and NTI\*even with President Obama’s endorsement\*difficult to implement and perhaps ineffective if implemented. Thus, NPT Article IV remains a problem and a vehicle for raising the risk of proliferation as long as it is cast as giving the right of full access to nuclear technologies to NPT state parties. That is not to say that nuclear fuel assurances cannot be successful under certain special conditions and circumstances. But the acceptability of these conditions is problematic for any country sensitive to its sovereignty or for any potential proliferators. Any system creating tiers of limited suppliers and recipients is likely to engender complaints of discrimination and a class system for recipients that will be resented.

#### Obama already pushing and failing

**Horner and Meier 9** [Daniel Horner and Oliver Meier, Arms Control Today, “Talks on Fuel Bank Stalled at IAEA”, October 2009]

Plans to establish an international nuclear fuel bank, a key part of nonproliferation programs put forward by several world leaders, have failed to receive the support they need to start being put in place. The International Atomic Energy Agency (IAEA) Board of Governors ended its September meeting with little progress since June, the last time the board met. Earlier this year, advocates of the proposed fuel bank had talked about a timetable under which the board in June would have directed the IAEA Secretariat to flesh out a proposal for the September meeting and the board could have then endorsed it. But at the June meeting, some of the board’s 35 members balked at the plans. The board essentially decided to continue discussing the plan at a conceptual level. The talks have not made much headway since then, sources at the September meeting said. IAEA Director-General Mohamed ElBaradei, President Barack Obama, and others have strongly backed the fuel bank concept. The aim of the fuel bank proposals is to dissuade countries from pursuing their own uranium-enrichment programs by providing them with an assured supply of fuel at market prices. The bank would serve as backup to existing commercial mechanisms for countries with good nonproliferation credentials. In February 2004, President George W. Bush proposed a version of this approach in a speech at the National Defense University in Washington. (See ACT, March 2004.) But Bush’s version required countries to “renounce” enrichment and spent fuel reprocessing and was combined with a call for a ban on enrichment- and reprocessing-related exports to states that do not already operate fuel cycle facilities. That approach led to complaints from many potential recipients, and U.S. officials eventually turned away from such language. All proposals so far, however, have come from current or potential supplier states, while potential recipients have been largely indifferent or critical. (See ACT, January/February 2009.)

#### Conditionality is bad – generates 2ac strategic skew by disincentivizng best use of offense – creates argumentative irresponsibility making debate poor advocate training – rigorous pre-round research solves offense

**US federal nuclear leadership is key to science diplomacy**

**AAAS ‘8** ((American Association for the Advancement of Science, 10 July 2008, “Energy Expert Calls on United States to Take Leadership in Nuclear Energy Framework”, <http://www.aaas.org/news/releases/2008/0710nuclear_energy.shtml>, [Miller])

**The** next U.S. **president will have a historic opportunity to exercise leadership in** increasing the global investment in **nuclear** technology**, energy expert Victor Reis said** at a AAAS briefing. But the stakes are higher than just finding an alternative to the rising price of oil and coal. Reis, a senior advisor to Secretary of Energy Samuel W. Bodman, said that a well-designed nuclear energy framework could drive global growth by bringing affordable, reliable energy to the developing world, address climate change through clean energy production, and promote international security by securing nuclear materials around the world. **"By increasing the civilian nuclear enterprise, the** next U.S. **president can make use of a historic opportunity to simultaneously attack the biggest interlocking issues that society will face for the next 50 years**," said Reis. Speaking at AAAS headquarters in Washington, D.C., Reis said that around 1.6 billion people, or 25% of the world's population, live without access to electricity and 2.4 billion, or 35%, rely on traditional, carbon-rich biomass like wood for their energy needs because they have no access to modern fuels. Because experts have found a strong correlation between electricity use and almost every statistic for quality of life including life expectancy, literacy, education, and gross domestic product per capita, Reis said, it is imperative that developed nations bring power to the world's neediest citizens. In addition to being an effective technology to meet the future energy needs of the developing world, Reis said that nuclear power generation is better for the environment because it does not release carbon dioxide into the atmosphere. In order to meet a conservative target of maintaining atmospheric carbon dioxide levels below 550 parts per million—a goal echoed in a 2008 report by the Intergovernmental Panel on Climate Change—while still fulfilling the world's energy needs, Reis says that governments must invest heavily in nuclear technology. "A lot of people around the world don't have access to electricity, and you don't want them to burn carbon-rich sources like coal," said Reis, adding that he doesn't see "how you can realistically address climate change without nuclear power." Reis said he is encouraged that many politicians, including those running for president, recognize climate change as among the most pressing issues for their first term in office. Sponsored by the AAAS Center for Science, Technology, and Security Policy, the 2 June briefing on nuclear energy brought together scientists, policy makers, students, and the media. At the event, Benn Tannenbaum, the Center's associate program director, said that he has noticed an increasing amount of opinion and commentary articles on nuclear technology in the nation's largest newspapers, suggesting that it is becoming a heavily discussed issue. "Nuclear energy has tremendous implications for the coming century," said Tannenbaum. "It's absolutely that vital that policy makers make informed decisions with the help of scientists to determine if and how nuclear energy programs move forward. The stakes are incredibly high." Reis said that regardless of U.S. domestic plans to increase nuclear energy production, a widespread global initiative to generate electricity using nuclear power is already underway. Around the world, there are already 439 nuclear reactors in 31 countries, representing 16% of the world's total electricity production. In the United States alone, there are 104 reactors representing 20% of domestic electricity production. Reis added that there are around 93 nuclear power-generating facilities on order or planned globally. He pointed out, however, that there are many challenges to increasing nuclear power around the world, most notably ensuring that radioactive materials used in nuclear power production are not obtained by terrorists or rogue states. One controversial solution announced in 2006 by the administration of U.S. President George W. Bush is the Global Nuclear Energy Partnership (GNEP), an international agreement that has been signed by 21 nations including the United States, the United Kingdom, Russia, China, and France. Under GNEP, the United States and other nations with advanced civilian nuclear energy production facilities would be responsible for safely reprocessing spent nuclear fuel from energy production and then would export it to be reused for other nations' energy programs. This would reduce the number of nuclear enrichment and reprocessing sites around the world, Reis said. He said that the Reliable Replacement Warhead (RRW) program, announced by Bush in 2004, would also help to significantly reduce the overall number of weapons in the U.S. nuclear arsenal while modernizing their design. Weapons experts believe that this may encourage other nations including Russia to reduce their stockpiles. While some experts like former Secretaries of State George P. Shultz and Henry A. Kissinger suggest that nations should aim to achieve a nuclear weapons-free world, others such as former Secretary of Defense Harold Brown and former Director of Central Intelligence John Deutch believe that it is an unreasonable goal and poor policy. Beyond the proliferation of enriched nuclear material, many critics of nuclear power production in the United States fear the increased amount of toxic materials that need to be transported from the reactors to storage after they are used. Reis said he understood those concerns but pointed to the 100 million miles of safe travel that the Department of Energy has overseen for the nation's nuclear weapons and energy materials. He said the same procedures can be applied to commercial nuclear energy. In addition, many nuclear power critics fear the consequences of reactor accidents like the 1986 Chernobyl accident in the Soviet Union and the 1979 Three Mile Island accident near Harrisburg, Pennsylvania. Reis once again pointed out the globe's "remarkable" safety record during more than 12,000 reactor-years of operation with significant improvements made to world's nuclear infrastructure following the incidents. The Three Mile Island incident caused no documented injuries and led to important improvements in U.S. and global safety operations, he said. He added that the Chernobyl disaster involved a reactor that was poorly designed and did not have sufficient containment, which lead to a new generation of reactors with higher safety specifications. Another significant issue with nuclear energy production is where to store the radioactive materials. One controversial proposal is to transport all waste to the Yucca Mountain Repository, a geological storage facility1000 feet deep in the Nevada desert. While the plan has its advantages, such as the ability to retrieve the materials after they are deposited, Reis said that many find the program "geographically unfair" because it makes one region assume the entire burden of the nation's nuclear waste. Regardless of the decision to increase nuclear energy production over the coming decades, Reis said that the Department of Energy (DOE) is able and ready to meet the new challenges of the 21st Century. With over 12,440 Ph.D. scientists, 25,000 visiting scientists, and 17 laboratories across the country, Reis said that **the DOE laboratories "represent one of the biggest scientific collections in the world [and] maybe in the history of civilization."** Beyond access to some of the **top scientific minds and computers** in the world, Reis highlighted several major DOE achievements including **maintaining six top research facilities**, certifying the U.S. nuclear weapons arsenal without underground testing, **helping other nations** secure their nuclear materials, and cleaning up the Rocky Flats weapons production facility and helping convert it into a wildlife refuge. In addition, Reis said that the DOE has nine years of successful operation of its Waste Isolation Pilot Plant (WIPP). Located in Carlsbad, New Mexico, the facility is an underground radioactive waste repository serving as a frontrunner for the Yucca Mountain site. "**Because of the implications of nuclear energy, good or bad, it is important that the** next **administration seize the opportunity for global leadership by using the Department of Energy's world leading assets**," Reis said. Reis added that **the nuclear enterprise could become a vehicle for international cooperation**, echoing a December 1953 speech by U.S. President Dwight D. Eisenhower in which he pledged to devote the nation's "entire heart and mind to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life."

**Science diplomacy accesses every impact**

**Fedoroff ‘8** (Nina, Science and Technology Advisor to the Secretary of State, “Making Science Diplomacy more Effective”, Testimony before the House Science Subcommittee on Research and Science Education, 4-2, <http://legislative.nasa.gov/hearings/4-2-08%20Fedoroff.pdf>)

**Science by its nature facilitates diplomacy because it strengthens political relationships, embodies powerful ideals, and creates opportunities** for all. The global scientific community embraces principles Americans cherish: transparency, meritocracy, accountability, the objective evaluation of evidence, and broad and frequently democratic participation. Science is inherently democratic, respecting evidence and truth above all. Science is also a common global language, able to bridge deep political and religious divides. Scientists share a common language. Scientific interactions serve to keep open lines of communication and **cultural understanding**. As scientists everywhere have a common evidentiary external reference system, members of ideologically divergent societies can use the common language of science to cooperatively address both domestic and the increasingly trans-national and global problems confronting humanity in the 21st century. There is a growing recognition that science and technology will increasingly drive the successful economies of the 21st century. Science and technology provide an immeasurable benefit to the U.S. by bringing scientists and students here, especially from developing countries, where they see democracy in action, make friends in the international scientific community, become familiar with American technology, and contribute to the U.S. and global economy. For example, in 2005, over 50% of physical science and engineering graduate students and postdoctoral researchers trained in the U.S. have been foreign nationals. Moreover, many foreign-born scientists who were educated and have worked in the U.S. eventually progress in their careers to hold influential positions in ministries and institutions both in this country and in their home countries. They also contribute to U.S. scientific and technologic development: According to the National Science Board`s 2008 Science and Engineering Indicators, 47% of full-time doctoral science and engineering faculty in U.S. research institutions were foreign-born. Finally, some types of science - particularly those that address the grand challenges in science and technology - are inherently international in scope and collaborative by necessity. The ITER Project, an international fusion research and development collaboration, is a product of the thaw in superpower relations between Soviet President Mikhail Gorbachev and U.S. President Ronald Reagan. This reactor will harness the power of nuclear fusion as a possible new and viable energy source by bringing a star to earth. ITER serves as a symbol of international scientific cooperation among key scientific leaders in the developed and developing world - Japan, Korea, China, E.U., India, Russia, and United States - representing 70% of the world`s current population. The recent elimination of funding for FY08 U.S. contributions to the ITER project comes at an inopportune time as the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project had entered into force only on October 2007. The elimination of the promised U.S. contribution drew our allies to question our commitment and credibility in international cooperative ventures. More problematically, it jeopardizes a platform for reaffirming U.S. relations with key states. It should be noted that even at the height of the cold war, the United States used science diplomacy as a means to maintain communications and avoid misunderstanding between the world`s two nuclear powers - the Soviet Union and the United States. In a complex multi-polar world, relations are more challenging, the threats perhaps greater, and the need for engagement more paramount. Using Science Diplomacy to Achieve National Security Objectives The welfare and stability of countries and regions in many parts of the globe require[s] a concerted effort by the developed world to address the causal factors that render countries fragile and cause states to fail. Countries that are unable to defend their people against starvation, or fail to provide economic opportunity, are susceptible to extremist ideologies, autocratic rule, and abuses of human rights. As well, the world faces common threats, among them **climate change, energy and water shortages, public health emergencies, environmental degradation, poverty, food insecurity, and religious extremism**. These threats can undermine the national security of the United States, both directly and indirectly. Many are blind to political boundaries, **becoming regional or global threats**. The United States has no monopoly on knowledge in a globalizing world and the scientific challenges **facing humankind** are enormous. Addressing these common challenges demands common solutions and necessitates **scientific cooperation**, common standards, and common goals. We must increasingly harness the power of American ingenuity in science and technology through strong partnerships with the science community in both academia and the private sector, in the U.S. and abroad among our allies, to advance U.S. interests in foreign policy. There are also important challenges to the ability of states to supply their populations with sufficient food. The still-growing human population, rising affluence in emerging economies, and other factors have combined to create unprecedented pressures on global prices of staples such as edible oils and grains. Encouraging and promoting the use of contemporary molecular techniques in crop improvement is an essential goal for US science diplomacy. An essential part of the war on terrorism is a war of ideas. The creation of economic opportunity can do much more to combat the rise of fanaticism than can any weapon. The war of ideas is a war about rationalism as opposed to irrationalism. Science and technology put us firmly on the side of rationalism by providing ideas and opportunities that improve people`s lives. We may use the recognition and the goodwill that science still generates for the United States to achieve our diplomatic and developmental goals. Additionally, the Department continues to use science as a means to reduce the proliferation of the weapons` of mass destruction and prevent what has been dubbed `brain drain`. Through cooperative threat reduction activities, former weapons scientists redirect their skills to participate in peaceful, collaborative international research in a large variety of scientific fields. In addition, new global efforts focus on improving **biological**, chemical, and **nuclear security** by promoting and implementing **best scientific practices as a means to enhance security, increase global partnerships, and create sustainability.**

### Exports DA 2AC

#### Massive nuclear incentives just passed – non-unique’s perception link

**Yurman ’12** (Nuclear energy R&D budgets spared major cuts Posted on January 5, 2012 by dyurman| 3 Comments Congress trims funding while adding new priorities By Dan Yurman Dan Yurman, nuclear blogger Dan Yurman publishes Idaho Samizdat, a blog about nuclear energy, and is a frequent contributor to ANS Nuclear Cafe.

A Congress that has public approval ratings in the single digits because of deficit-related gridlock managed to get some of the federal budget out the door for 2012. The Energy & Water Appropriation Bill, **which covers funding** for the U.S. Department of Energy, contains $768 million for nuclear energy programs. Nuclear energy at the DOE fared better than some other high profile DOE programs. The Obama administration’s poster child for a green economy—Energy Efficiency & Renewable Energy—suffered a cut of $1.9 billion, reducing the funding request by the White House by more than half. The DOE’s Science programs also saw a significant reduction of $616 million from the President’s budget. And, nationwide environmental cleanup of DOE sites suffered a reduction of $469 million. Emphasis on small modular reactors Of the $768 million in the bill for the nuclear energy program at the DOE, $439 million is allocated to nuclear energy research and development. A key element of the appropriation is a $67 million line item for licensing technical support for light water reactors. It provides funds for first-of-a-kind engineering support for two reactor designs and sites. Supporters of fast reactor SMR designs had hoped for appropriation language that would have advanced their cause, but it didn’t appear in the committee report related to licensing activities. Within a line item of $136 million for reactor concepts, $29 million is provided for advanced R&D on SMR concepts that presumably would include some fast reactor work scope.

#### Steadfast barriers to exports now

Renauer, 10/2/12 [seasoned investor in the financial markets He earned his University degree in Biology before discovering the stock market Over the past decade he has become actively involved in trading individual stocks, and options. “Driving Natural Gas Prices Part 1: Exports”, <http://seekingalpha.com/article/900261-driving-natural-gas-prices-part-1-exports>]

Just a glance at the map of world estimated LNG prices and it's hard to imagine why there aren't more export terminals being constructed around the clock. Unfortunately for natural gas producers in the US, there are [regulatory](http://www.fossil.energy.gov/programs/gasregulation/authorizations/Questions.html) [hurdles](http://www.fossil.energy.gov/programs/gasregulation/authorizations/Questions.html) in place that limit exports of natural gas, especially to non free trade agreement (Non-FTA) countries.

#### Exports won’t be profitable for decades

**State-Journal 12** [Study: Natural gas exports likely unprofitable for decades, Sep 15, 2012, West Virginia State-Journal]

While discussion of exporting liquefied natural gas has focused on the effect on domestic prices, a new study finds that international prices will be the limiting factor.¶ In fact, not much U.S. gas is likely to find a market overseas through at least 2040, according to "U.S. LNG Exports: Truth and Consequence," published Aug. 10 by the James Baker Institute for Public Policy at Rice University in Houston, Texas.¶ Baker Institute economist and report author Kenneth B. Madlock cites several reasons.¶ First, the current price differential — around $3 per million British thermal units in the U.S., with imports to Japan at around $17 — is transitory, Madlock wrote.¶ Prices are so low in the U.S. now because a mild winter coincided with a surge in production. And they're so high in Japan only while suppliers adjust to that country's sudden shift from nuclear power to natural gas following the March 2011 tsunami that knocked out the Fukushima nuclear plant.¶ In addition, the amount of export capacity proposed in the U.S. would have a significant effect on global prices.¶ "LNG trade in 2011 totaled 32 (billion cubic feet per day, or bcfd)," Madlock wrote.¶ "Currently, in the U.S. alone there is over 17 bcfd of export capacity in various stages of proposal and development," he continued. "If even one-third of this capacity is built and placed into operation, it will dramatically alter the ability to supply the Asian market with natural gas."¶ Indeed, even without being exported, U.S. shale gas has been reducing prices in Europe and Asia by displacing gas that could have been imported here.¶ "LNG supplies whose development was anchored to the belief that the United States would be a premium market have been diverted to European and Asian buyers," Madlock wrote. ¶ That downward price pressure is changing the pricing paradigm, he wrote -- from the long-time practice of indexing contracts to the price of oil to indexing them instead to the lower spot price.¶ Finally, Madlock sees plenty of conventional and unconventional gas supplies available for development globally.¶ "The apparent profitable export option from the U.S. market based on current market conditions is transitory, as current market conditions beget a supply response abroad that erodes current price differentials," he concludes.¶

#### No link—LNG in the U.S. is inevitable and the link is linear at best

**Weeks, 5** (Jennifer, E: The Environmental Magazine, “Highly combustible: debating the risks and benefits of LNG,” Nov-Dec 2005, http://findarticles.com/p/articles/mi\_m1594/is\_6\_16/ai\_n15947809)

"Given the enormity of our energy needs, a segment of our supply has to come from LNG," says former U.S. Representative Philip Sharp, who served as Congressional chair of the National Commission on Energy Policy and is now president of Resources for the Future, an environmental think tank in Washington, D.C. "There's no way that cleaner sources add up to what we need, and gas is much cleaner than coal or oil. LNG should not become an excuse for failing to press forward on energy efficiency and renewable fuels, but we have to deal within the confines of our political and economic institutions, and changes in the energy system are incremental," says Sharp.

#### Russian econ is resilient – budget flexibility, reserve funds, and falling ruble check total collapse

Jason Bush 7-2-2012; Reuters columnist, Oil-price slide highlights risks to Putin's Russia http://articles.economictimes.indiatimes.com/2012-07-02/news/32508636\_1\_oil-price-largest-oil-producer-peter-westin

Analysts say the impact on Russia of lower oil prices may be milder than during previous falls. "In the short term, in the next one to three years, we are fine," said Tchakarov. He noted that according to Finance Ministry calculations, every one dollar fall in the oil price means that the government loses around 55 billion roubles ($1.7 billion) in oil-related taxes over the course of a year. With the budget presently balancing at around $115 per barrel, an oil price of $90 per barrel, if sustained over a full year, would leave the government short to the tune of around $40 billion a year. But that is still just a fraction of the $185 billion that Russia has stashed away in two fiscal reserve funds, designed to stabilise the budget in just such an emergency. Even at $60 per barrel - the average oil price during the crisis year of 2009 - the reserve funds could cover the shortfall for about two years. "I find this worrying about the budget at this moment a little beside the point," said Clemens Grafe, chief Russia economist at Goldman Sachs. "The fiscal buffers they have to absorb this are going to be sufficient without cutting expenditure." Analysts also point out that since the previous financial crisis in 2008-2009, the central bank has radically changed the exchange rate regime, allowing the rouble to fall in line with the cheaper oil price. Since oil began its latest slide in mid-March, the rouble has lost around 15 percent of its value against the dollar. "The rouble weakened exactly in line with the oil price. And a weaker rouble is very good because it will secure the rouble equivalent of oil taxes for the budget," said Evgeny Gavrilenkov, chief economist at Troika Dialog.

#### No impact to Russian economy

Blackwill, 09 – former associate dean of the Kennedy School of Government and Deputy Assistant to the President and Deputy National Security Advisor for Strategic Planning (Robert, RAND, “The Geopolitical Consequences of the World Economic Recession—A Caution”, http://www.rand.org/pubs/occasional\_papers/2009/RAND\_OP275.pdf, WEA)

Now on to Russia. Again, five years from today. Did the global recession and Russia’s present serious economic problems substantially modify Russian foreign policy? No. (President Obama is beginning his early July visit to Moscow as this paper goes to press; nothing fundamental will result from that visit). Did it produce a serious weakening of Vladimir Putin’s power and authority in Russia? No, as recent polls in Russia make clear. Did it reduce Russian worries and capacities to oppose NATO enlargement and defense measures eastward? No. Did it affect Russia’s willingness to accept much tougher sanctions against Iran? No. Russian Foreign Minister Lavrov has said there is no evidence that Iran intends to make a nuclear weapon.25 In sum, Russian foreign policy is today on a steady, consistent path that can be characterized as follows: to resurrect Russia’s standing as a great power; to reestablish Russian primary influence over the space of the former Soviet Union; to resist Western eff orts to encroach on the space of the former Soviet Union; to revive Russia’s military might and power projection; to extend the reach of Russian diplomacy in Europe, Asia, and beyond; and to oppose American global primacy. For Moscow, these foreign policy first principles are here to stay, as they have existed in Russia for centuries. 26 None of these enduring objectives of Russian foreign policy are likely to be changed in any serious way by the economic crisis.

#### Corruption inevitably crushes growth – and no short-term reforms will pass or be effectively implemented

Alexei Devyatov 6-15-2011; Chief Economist at URALSIB Capital, “ Russia Economy 2H11 Outlook: Reduced Impact of Oil on Russian Economic Growth” <http://www.bne.eu/story2735/Reduced_Impact_of_Oil_on_Russian_Economic_Growth>

We expect the Russian economy to grow about 4% on average in 2011-13 and starting from 2014, at 2-4%. Russia is an extremely interesting case. On the one hand, it has huge human capital and abundant natural resources. On the other hand, there is a lack of opportunities for transforming that potential into strong economic growth and prosperity. The main obstacles are an uncompetitive economy, an addiction to oil; poor demographics; weak institutions; and as a consequence, a poor investment climate. Administrative barriers make it more difficult for entrepreneurs to enter the market, which reduces competition and results in higher prices. The businesses suffer from pervasive corruption, which has effectively turned into unofficial tax burden in Russia. To attain rapid economic growth and prosperity, Russia needs to drastically improve its institutions, which means removing an entire class of corrupt officials. Unfortunately, over the last ten years, little has changed in terms of the quality of institutions, not least because those interested in maintaining the status quo have sufficient power to effectively block the reforms. Still we see the potential for gradual institutional changes as the government intensifies its efforts to fight corruption, to improve investment climate, and to modernize the economy

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### Electricity Prices

#### Prices high now and other alt causes are bigger

**Bastasch ‘9-21** (Report: More than 200 coal-fired generators slated for shutdown Published: 11:29 PM 09/21/2012 By Michael Bastasch, daily caller staff writer, political analyst,

Within the next three to five years, **more than 200 coal-fired electric generating units will be shut down across 25 states due to EPA regulations and factors including cheap natural gas, according to a new report** by the American Coalition for Clean Coal Electricity (ACCCE). “This is further evidence that **EPA is waging a war on coal, and a war on affordable electricity prices** and jobs. EPA continues to ignore the damage that its new regulations are causing to the U.S. economy and to states that depend on coal for jobs and affordable electricity,” said Mike Duncan, president and CEO of ACCCE, in a statement. However, ACCCE notes that EPA policies may have played a role more than 4,800 megawatts of announced closures not included on in their report which would bring total shutdowns to 241 coal generator in 30 states — more than 36,000 MW of electric generation or 11 percent of the U.S. coal fleet. The most affected states include Ohio, Pennsylvania, West Virginia, Virginia, and North Carolina, which will see a combined 103 coal-fired generators shut down. “Actually **our utility rates are higher** and the impact is such that it’s going to interfere with the quality of life that a lot of individuals have in my community,” said John McNeil, mayor of Red Springs, N.C., in an ACCCE video — one of the heavily affected states.

#### shale industry unsustainability and high decline rates prove

Berman, 11/12/12 [Arthur, lecturer at Rice Graduate School of Management, geological consultant with 32 years of experience in petroleum exploration and production, M.S. Geology Colorado School of Mines, B.A Amherst College, published 50 articles on geology, member of the National Petroleum Council and on the Board of Directors of ASPO USA editorial board of The Oil Drum, and an associate editor of the AAPG (American Association of Petroleum Geologists) Bulletin, “Shale Gas Will be the Next Bubble to Pop - An Interview with Arthur Berman”, <http://oilprice.com/Interviews/Shale-Gas-Will-be-the-Next-Bubble-to-Pop-An-Interview-with-Arthur-Berman.html>]

A lot of investors from other parts of the world, particularly the oil-rich parts have been making somewhat high-risk investments in the United States for many years and, for a long time, those investments were in real estate. Now these people have shifted their focus and are putting cash into shale. There are two important things going on here, one is that the capital isn't going to last forever, especially since shale gas is a commercial failure. Shale gas has lost hundreds of billions of dollars and investors will not keep on pumping money into something that doesn’t generate a return. The second thing that nobody thinks very much about is the decline rates shale reservoirs experience. Well, I've looked at this. The decline rates are incredibly high. In the Eagleford shale, which is supposed to be the mother of all shale oil plays, the annual decline rate is higher than 42%. They're going to have to drill hundreds, almost 1000 wells in the Eagleford shale, every year, to keep production flat. Just for one play, we're talking about $10 or $12 billion a year just to replace supply. I add all these things up and it starts to approach the amount of money needed to bail out the banking industry. Where is that money going to come from? Do you see what I'm saying? Oilprice.com: You've been noted suggesting that shale gas will be the next bubble to collapse. How do you think this will occur and what will the effects be? Arthur Berman: Well, it depends, as with all collapses, on how quickly the collapse occurs. I guess the worst-case scenario would be that several large companies find themselves in financial distress. Chesapeake Energy recently had a very close call. They had to sell, I don't know how many, billions of dollars worth of assets just to maintain paying their obligations, and that's the kind of scenario I'm talking about. You may have a couple of big bankruptcies or takeovers and everybody pulls back, all the money evaporates, all the capital goes away. That's the worst-case scenario.

#### that ensures catastrophic price spikes

Maize, 12/1/12 [“Is Shale Gas Shallow or the Real Deal?”, Kennedy, Veteran Journalist Kennedy Maize has spent the past 40 years working as a journalist, analyst, and manager in the private sector and federal government, with over 35 years of that focused on energy and environmental topics. Over that time, he has seen myriad examples of how group think, policy fads, and bad judgment can result in colossal failures, particularly in the field of atomic energy. Maize has seen, up close and personal, the demise of the U.S. Atomic Energy Commission, the arrival of the U.S. Nuclear Regulatory Commission, the birth of the U.S. Department of Energy, the failures of nuclear flight, the hubris of atomic earthmoving, the boom and bust uranium market, the birth and death of breeder reactors, and the 60-year wandering in the wilderness of nuclear waste policy. After graduating from Penn State and graduate study at the University of Maryland, Kennedy Maize worked for newspapers in Pennsylvania, New York, and Virginia and the Associated Press in Baltimore. He then spent five years in management at the National Institute of Health and the U.S. Nuclear Regulatory Commission before taking a job covering energy, environment, and business topics for Editorial Research Reports, a division of Congressional Quarterly, where his work appeared in over 1,000 daily newspapers in the U.S. during the mid-to-late 1970s. Maize became a staff writer and editor at The Energy Daily, a preeminent energy trade paper, on March 28, 1979, the day the Three Mile Island accident began outside Harrisburg, Pa. Over more than 10 years at The Energy Daily, he covered the nuclear and coal industries, including stories involving the Clinch River Breeder Reactor, the U.S. Synthetic Fuels Corp., the Powder River Basin coal leasing scandal, and the Chernobyl explosion. In 1993, he founded The Electricity Daily, where he was the editor for 14 years, writing about changes in the electricity business, the rise and fall of Enron, the stagnation of the nuclear power business, and the arrival of market forces in the utility field. Since 2006, he has been an editor at POWER magazine, and the founder of MANAGING POWER magazine, where he has written about the Fukushima catastrophe, the emergence of shale gas and decline of coal, and the often ill-advised push for renewable electricity technologies <http://www.powermag.com/gas/Is-Shale-Gas-Shallow-or-the-Real-Deal_5188.html>]

In an interview with POWER, Berman argued that the boom in drilling shale gas wells has obscured a long-term decline in conventional gas supply. But a coming rapid decline in shale production, he said, will soon reveal the overall limits to the gas boom, and volatility and upward pressure could return to natural gas prices. “It’s not a problem for today or tomorrow,” Berman said, “but it is coming. Once we work through the current oversupply, if capital is not forthcoming,” prices will spike. The gas supply bubble will burst. Because of the current gas glut, with long prices in the range of $3 per million cubic feet (mcf), drilling shale gas wells has tanked, noted Berman. Chesapeake Energy, the most bullish of the shale gas players, is selling assets and shifting rigs to drilling for oil because the company just can’t make money on $3 gas. “I can see a time not too many months away when we could see gas supply in rather serious decline,” Berman said, noting that “there is plenty of gas, but it takes a long time to shift momentum back” to gas drilling. At a 2010 meeting in Washington, as low gas prices were resulting in a decline in new drilling, Berman commented, “Shale plays are marginally commercial at best.” Greatly complicating the supply equation, said Berman, is the nature of shale gas wells. “Shale wells decline 30 to 40% per year,” he said. “Conventional wells decline 20 to 25%. What most don’t grasp is how many wells it takes just to keep supply flat.” In the Barnett Shale in Texas, where Berman is most familiar with the geology, he calculates that the annual decline in the gas resource is 1.7 bcf/day. In order to add to the net Barnett production, Berman says, companies would have to drill 3,880 wells, at a cost of $12 billion. “We are setting ourselves up for a potential reduction in supply and price will go up,” said Berman. “I don’t know how much it will go up, and there is a check-and-balance with coal. There will be gas-coal switching if prices do go much higher than now.”

#### Econ resilient – IMF checks

**Business Week 2010** (7/19, IMF to Seek $250 Billion Boost to Lending Capacity, http://www.businessweek.com/news/2010-07-19/imf-to-seek-250-billion-boost-to-lending-capacity.html, WEA)

July 19 (Bloomberg) -- The International Monetary Fund is seeking a boost in its lending capacity to $1 trillion, from the current $750 billion, at a Group of 20 summit in South Korea in November, according to a Korean government official. The increase would help strengthen a global financial safety net to counter crises, the official said on condition of anonymity because the talks are private. South Korea is chair of the G-20 this year. IMF Managing Director Dominique Strauss-Kahn told the Financial Times that a boost to $1 trillion in IMF lending firepower was a “correct forecast.” Strauss-Kahn has sought to enhance the IMF’s role in serving as a buttress against financial crises, already overseeing a trebling in the fund’s war-chest to $750 billion since early 2009. While the IMF doesn’t foresee the global economy sinking back into a recession, the European debt crisis and elevated U.S. unemployment threaten to curtail the recovery. “They will have to increase the lending capacity over time to contain a crisis more effectively,” said Ham Joon-Ho, a professor of international economics and finance at Yonsei University in Seoul. Ham added that the IMF will also need to work to encourage members to line up contingency financing with the fund, which most have steered clear of given concern such a step would carry the “stigma” of signaling financial trouble.

### China Impact

#### Predictive evidence—resilience and interdependence will increase

**Dongxiao, 12** (CHEN Dongxiao: Vice President of SIIS, and Ph.D. in Law received from the Department of International Politics of Fudan University. Jan. 5, 2012. “China-US Relations in 2012: Caution Ahead,” http://chinausfocus.com/slider/no-reason-for-chagrin-over-china-us-relations-but-cautious-management-needed-in-2012/, Callahan)

Three driving forces have contributed to the improvement in US-China relations in 2011: mutual commitment, multi-function mechanisms, and increasing interdependence. Beijing and Washington both stressed their commitment to building a cooperative partnership based on mutual respect and mutual benefit following a rocky year of bilateral relations in 2010. Both sides have stressed that the relationship between China and the United States should be cooperative and mutually beneficial rather than zero-sum, and that the two sides should stand together in the face of difficulty and carry out cooperation on an equal footing. The mutual commitment between China and the US has been bolstered by an increasing number of bilateral mechanisms with policy communication, coordination, and implementation functions (“C2I”). 2011 has seen of the growth of “C2I” mechanisms intensify. with a number of new initiatives, including High-level Consultation on People-to-People Exchanges, the US-China Governors Forum, and the Strategic Security Dialogue and Asia-Pacific Affairs Consultation under the framework of Strategic and Economic Dialogue (S&ED). While the former two initiatives have either reflected thriving interaction in cross-cultural domains or tapped the huge potential of sub-national cooperation across the Pacific, the latter two mechanisms have greatly upgraded capacity to address difficult and sensitive military and security issues in bilateral relations n and build confidence in US-China relations. The **60 plus bilateral mechanisms**, plus frequent exchanges of informal visits and workshops between senior officials have built an impressive level of institutionalization in US-China bilateral relations that has enhanced the predictability of relations between the two countries and helped consolidate the foundation of the relations. The substance of the bilateral relationship, in essence, is not to follow the two presidents’ agreements in words, but to follow the roadmap in action, and those bilateral mechanisms have built significant capacity to do this. Thirdly and perhaps most fundamentally, **the growing interdependence** across the Pacific and emerging agenda of global governance has served as the “ballast” in the bilateral relationship. Despite numerous trade disputes between the two countries, economic interdependence has been steadily enhanced, manifested either by the hike of bilateral trade and investment volume, symbiotic financial relations, or the economic restructuring now underway in both countries. **This interdependence has transcended economics,** and is growing increasingly comprehensive in nature.

### India Impact

#### Relations are inevitable regardless of government ties

**Mathai 12** (Ranjan is the Foreign Secretary of India, 2012, “India's foreign secretary addresses Washington,”http://www.indusbusinessjournal.com/ME2/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=E3E6AF44D3C44BED9F987F95ECDD2066)

However, given our different circumstances, history, location and levels of development, we will occasionally have differing perspectives and policies. But, this can be a source of great value and strength in our dialogue; and, it also enables us to work together for a broad global consensus on issues of common interest. But, for that, we should attach real value to each other's perspectives and appreciate each other's interest and sensitivities; and, when we differ, we should be able to speak candidly and respectfully to each other, and **insulate the vast common ground** between us **from** the **differences in our relationship**. We must remember that while we may have occasionally different perspectives, **we are also united by a fundamental stake in each other’s success**, because in succeeding individually, we can advance our common interests and inspire a world mirrored in our ideals. And, **even if our** two **governments did nothing**, it would still be an extraordinary relationship, because of the growing ties of kinship between our people and the vitality of private partnerships of enterprise, innovation, research and education across every field of human endeavor. But, I believe that we have the political momentum, public goodwill, a comprehensive architecture of engagement, comfort and confidence in the relationship, the experience of bold and ambitious undertakings, a proven capacity to work through challenges and, as we have seen in recent years, a growing habit of taking tangible steps on a regular basis to advance our cooperation. So, as I look ahead, we will continue to consolidate and affirm our strategic partnership, by completing existing projects and focusing on the wealth of new opportunities that we have. We should continue to stay in close touch on the current challenges in the world, in our neighborhood and beyond. And, we should, above all, continue to strengthen and expand the long-term strategic framework of our relationship, so that we can fully harness the boundless opportunities that this relationship has for our people and the substantial benefit that it can bring to this world.

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#### Immigration reform wont pass – Republicans are too afraid of their base backlashing

Wolf Blitzer (CNN Host, The Situation Room) and Michael Crowley (Time magazine political correspondent) January 3, 2013 “Resolving Fiscal Crisis; Al Jazeera Makes Major Move on U.S.; Behind-the-Scenes at the White House; Asteroid to Make close Call with Eart” transcript from ‘The Situation Room’ Lexis

BLITZER: Your colleague, Michael Greenwald (ph), has a strong piece in the new issue of "Time" in which he says, among other things, "Obama's second term is shaping up to be full of non-stop, overt partisan warfare. Congressional scholars say the modern GOP has taken the confirmation process to new extremes." Go ahead and elaborate." CROWLEY: Well, you know, Wolf, to some degree, these are powers that have always been there but the norms in Washington are changing. People are more aggressive about exercising powers they have. You know, there's just a little bit less of politeness, there's a little bit less of -- this is the decorum. This is how we've always done it. People are saying, where is our leverage? How can we use it? How can we maximize it? And people are finding new ways to do it. They're being more aggressive. And again, it's just a very tense partisan atmosphere right now. We just came out of this election. There's a lot of bitterness over that. They're fighting over the budget. And also, I think that there's evidence that shows that Republicans in Congress are more conservative than they were, thanks to a lot of backers, including the way primaries are working out on the Republican side. More conservatives who really have a stomach for a fight. They're not interested in compromising, but they're not interesting in Washington traditions like deferring to the president to let him choose his team of advisers, which is kind of a long- standing Washington point of etiquette which has kind of gone out the window now. BLITZER: What area where there could be some bipartisan cooperation is a sensitive issue that wasn't tackled during the first term, comprehensive immigration reform. The president clearly wants to do something this year. There are some Republicans, Marco Rubio, for example, he looks to be ready to cooperate, Lindsey Graham of South Carolina. You think that they're going to get something done? I remember the Bush administration, President Bush, trying to work with Senator Kennedy, Senator McCain, couldn't do it then. CROWLEY: I'm a skeptic, Wolf. I may be too cynical. And my prediction is not worth much more than anyone else's, but I would just say that the reason I'm skeptical is the passion about immigration within the republican base that I've seen personally and you probably have as well, but, you know, in my travels on the campaign trail, particularly, the Republican primaries, it was no issue that infuriated Republican primary voters like the immigration. The rhetoric they used. I was at a town hall forum where I heard a guy talking about threatened to shoot people coming across the boarder. There is so much anger. Now, I haven't heard conservatives say that do you think the party is waking up, that some of the key Republican media outlets might be changing their tone, making a little bit easier coming some of the anger and making it easier for Republicans to make (ph) a deal, but I remain skeptical. BLITZER: Don't you think the Republicans, though, want to reach out to Hispanic community and demonstrate that they are not simply walking away completely from them? CROWLEY: That's right. And so, that's the bind they face, but I just think that the base is not there yet. The Republicans who vote in primaries, who will be voting in the midterm primaries as we go into the midterm Congressional elections and who will shape the next presidential primary, they're not there yet.

#### Immigration reform wont pass

Ryu Spaeth (writer for The Week) January 3, 2013 “Will Congress' budget battles kill immigration reform and gun control?” <http://theweek.com/article/index/238367/will-congress-budget-battles-kill-immigration-reform-and-gun-control>

Congress' budget battles are only expected to get gorier over the next couple of months, as Republicans and Democrats try to reach a deal that would prevent $1.2 trillion in crippling spending cuts, a U.S. debt default, and a government shutdown. However, the White House insists that President Obama "is planning to move full steam ahead with the rest of his domestic policy agenda," say Elise Foley and Sam Stein at The Huffington Post. Immigration reform and gun control are at the top of the list, but the chances of their quick passage seem slim given the heated atmosphere in Congress. "The negative effect of this fiscal cliff fiasco is that every time we become engaged in one of these fights, there's no oxygen for anything else," an unidentified Senate Democratic aide told HuffPo. "It's not like you can be multi-tasking — with something like this, Congress just comes to a complete standstill." The key to congressional action is to strike when the iron is hot. In the case of immigration reform, the GOP has to feel the sting of Mitt Romney's defeat as if it were yesterday. Supporters of gun control, an issue that had been all but abandoned before the school shooting in Connecticut, say Obama must act while public opinion is on their side. As time passes, it's only logical to assume that a sense of urgency will give way to the gravitational pull of preserving the status quo. And, of course, there is the boulder-sized obstacle known as the GOP-controlled House, which has proven time and again that it has no interest in compromising with Democrats on pretty much anything. In addition to keeping immigration and gun control in the spotlight, the Obama administration may have to adopt the same strategy it used (or stumbled upon) in the deal to extend the Bush tax cuts for all but the wealthiest Americans, which involved securing strong Republican support in the Senate. On immigration, at least, GOP party leaders are reportedly eager to reach a deal in order to give Republicans a better shot at wooing Latino voters. As Karen Tumulty and Peter Wallsten write at The Washington Post:

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### 1AC Plan – with S-PRISM

#### The United States federal government should substantially increase loan guarantees for integral fast reactors using the S-PRISM design.

### Proliferation

#### Advantage 1: Prolif

#### Nuclear power construction is likely worldwide – Inaction on IFRs is killing US leadership and ability to influence prolif

**Shuster 11** [Joseph Shuster, founder of Minnesota Valley Engineering and Chemical Engineer, 9-8-2011, "Response to Draft Report From Obama’s Blue Ribbon Commission (BRC) on America’s Nuclear Future dated July 29, 2011," Beyond Fossil Fools]

Contrary to the commission’s declarations on the matter, the U.S. is in danger of losing its once ¶ strong nuclear leadership. As a result we would have less to say about how nuclear materials are ¶ to be managed in the world and that could expose the U.S. to some inconvenient if not downright ¶ dangerous consequences. China is now building a large pilot plant said to be identical to our ¶ successful EBR-II plant that proved the design of the IFR. Meanwhile in the U.S. after complete ¶ success, EBR II was shut down, not for technical reasons but for political reasons during the ¶ Clinton administration, a decision destined to be one of the worst in our nation’s history.¶ Much of the world is already committed to a nuclear future with some countries eagerly waiting ¶ to license the American version of Generation IV Fast Reactors—the IFR. We still have the best ¶ IFR technology in the world but have squandered much of our lead, partly by allowing a largely ¶ unqualified commission two years of useless deliberation. What we really did was give our ¶ competitors an additional two years to catch up.

#### IFR restores leadership on nuclear issues – key to contain proliferation

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "IFR FaD context – the need for U.S. implementation of the IFR," 2/18/10) http://bravenewclimate.com/2010/02/18/ifr-fad-context/-http://bravenewclimate.com/2010/02/18/ifr-fad-context/

ON THE NEED FOR U.S. IMPLEMENTATION OF THE INTEGRAL FAST REACTOR¶ The IFR ties into a very big picture — international stability, prevention of war, and avoiding “proliferation” (spread) of nuclear weapons.¶ – The need for energy is the basis of many wars, including the ones we are engaged in right now (Iraq and Afghanistan). If every nation had enough energy to give its people a decent standard of living, that reason for conflict would disappear.¶ – The only sustainable energy source that can provide the bulk of the energy needed is nuclear power.¶ – The current need is for more thermal reactors — the kind we now use.¶ – But for the longer term, to provide the growing amount of energy that will be needed to maintain civilization, the only proven way available today is with fast-reactor technology.¶ – The most promising fast-reactor type is the IFR – metal-fueled, sodium-cooled, with pyroprocessing to recycle its fuel.¶ – Nobody knows yet how much IFR plants would cost to build and operate. Without the commercial-scale demo of the IFR, along with rationalization of the licensing process, any claims about costs are simply hand-waving guesses.¶ \* \* \* \*¶ Background info on proliferation (of nuclear weapons). Please follow the reasoning carefully.¶ – Atomic bombs can be made with highly enriched uranium (90% U-235) or with good-quality plutonium (bomb designers want plutonium that is ~93% Pu-239).¶ – For fuel for an LWR, the uranium only has to be enriched to 3 or 4% U-235.¶ – To make a uranium bomb you don’t need a reactor — but you do need access to an enrichment facility or some other source of highly enriched uranium…¶ – Any kind of nuclear reactor can be used to make weapons-quality plutonium from uranium-238, but the uranium has to have been irradiated for only a very short period. In other words, nobody would try to make a plutonium weapon from ordinary spent fuel, because there are easier ways to get plutonium of much better quality.¶ – Plutonium for a weapon not only has to have good isotopic quality, it also has to be chemically uncontaminated. Thus the lightly irradiated fuel has to be processed to extract the plutonium in a chemically pure form. But mere possession of a reactor is not sufficient for a weapons capability — a facility using a chemical process called PUREX is also needed.¶ – Regardless of how many reactors a country has, it cannot have a weapons capability unless it has either the ability to enrich uranium or to do PUREX-type fuel reprocessing.¶ – Therefore, the spread of weapons capability will be strongly inhibited if the only enrichment and reprocessing facilities are in countries that already have a nuclear arsenal.¶ – But that can only happen if countries with reactors (and soon that will be most of the nations of the world) have absolutely ironclad guarantees that they can get the fuel they need even if they can’t make their own, regardless of how obnoxious their political actions might be.¶ – Such guarantees will have to be backed up by some sort of international arrangement, and that can only come to pass if there is effective leadership for the laborious international negotiations that will have to take place. (For a relevant discussion, see here)¶ – At present, the only nation that has a realistic potential to be such a leader is the United States.¶ – But a country cannot be such a leader in the political arena unless it is also in the technological forefront.¶ – The United States used to be the reactor-technology leader, but it abandoned that role in 1994 when it terminated the development of the IFR.¶ – Since then, other nations — China, India, Japan, South Korea, Russia, France — have proceeded to work on their own fast-reactor versions, which necessarily will involve instituting a fuel-processing capability.¶ – Thus the United States is being left behind, and is rapidly losing its ability to help assure that the global evolution of the technology of nuclear energy proceeds in a safe and orderly manner.¶ – But maybe it’s not too late yet. After all, the IFR is the fast-reactor technology with the post promise (for a variety of reasons), and is ready for a commercial-scale demonstration to settle some uncertainties about how to scale up the pyroprocess as needed, to establish better limits on the expected cost of production units, and to develop an appropriate, expeditious licensing process.¶ – Such a demo will require federal seed money. It’s time to get moving.

#### Transition to IFRs create a global proliferation resistant fuel cycle

**Stanford 10** (Dr George S. Stanford, nuclear reactor physicist, retired from Argonne National Laboratory, "Q%26A on Integral Fast Reactors – safe, abundant, non-polluting power," 9/18/10) [http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http://bravenewclimate.com/2010/09/18/ifr-fad-7/](http://bravenewclimate.com/2010/09/18/ifr-fad-7/-http%3A//bravenewclimate.com/2010/09/18/ifr-fad-7/)

Thermal reactors with reprocessing would do at least a little better.¶ Recycling (it would be with the PUREX process, or an equivalent) could stretch the U-235 supply another few decades—but remember the consequences: growing stockpiles of plutonium, pure plutonium streams in the PUREX plants, and the creation of 100,000-year plutonium mines.¶ If you’re going to talk about “PUREX” and “plutonium mines” you should say what they are. First, what’s PUREX?¶ It’s a chemical process developed for the nuclear weapons program, to separate plutonium from everything else that comes out of a reactor. Weapons require very pure plutonium, and that’s what PUREX delivers. The pyroprocess used in the IFR is very different. It not only does not, it cannot, produce plutonium with the chemical purity needed for weapons.¶ Why do you keep referring to “chemical” purity?¶ Because chemical and isotopic quality are two different things. Plutonium for a weapon has to be pure chemically. Weapons designers also want good isotopic quality—that is, they want at least 93% of their plutonium to consist of the isotope Pu- 239. A chemical process does not separate isotopes.¶ I see. Now, what about the “plutonium mines?”¶ When spent fuel or vitrified reprocessing waste from thermal reactors is buried, the result is a concentrated geological deposit of plutonium. As its radioactivity decays, those deposits are sources of raw material for weapons, becoming increasingly attractive over the next 100,000 years and more (the half-life of Pu-239 being 24,000 years).¶ You listed, back at the beginning, some problems that the IFR would ameliorate. A lot of those problems are obviously related to proliferation of nuclear weapons.¶ Definitely. For instance, although thermal reactors consume more fuel than they produce, and thus are not called “breeders,” they inescapably are prolific breeders of plutonium, as I said. And that poses serious concerns about nuclear proliferation. And proliferation concerns are even greater when fuel from thermal reactors is recycled, since the PUREX method is used. IFRs have neither of those drawbacks.¶ Why does it seem that there is more proliferation-related concern about plutonium than about uranium? Can’t you make bombs from either?¶ Yes. The best isotopes for nuclear explosives are U-235, Pu- 239, and U-233. Only the first two of those, however, have been widely used. All the other actinide isotopes, if present in appreciable quantity, in one way or another complicate the design and construction of bombs and degrade their performance. Adequate isotopic purity is therefore important, and isotopic separation is much more difficult than chemical separation. Even so, with plutonium of almost any isotopic composition it is technically possible to make an explosive (although designers of military weapons demand plutonium that is at least 93% Pu-239), whereas if U-235 is sufficiently diluted with U-238 (which is easy to do and hard to undo), the mixture cannot be used for a bomb.¶ High-quality plutonium is the material of choice for a large and sophisticated nuclear arsenal, while highly enriched uranium would be one of the easier routes to a few crude nuclear explosives.¶ So why the emphasis on plutonium?¶ You’re asking me to read people’s minds, and I’m not good at that. Both uranium and plutonium are of proliferation concern.¶ Where is the best place for plutonium?¶ Where better than in a reactor plant—particularly an IFR facility, where there is never pure plutonium (except some, briefly, when it comes in from dismantled weapons), where the radioactivity levels are lethal, and where the operations are done remotely under an inert, smothering atmosphere? Once enough IFRs are deployed, there never will need to be plutonium outside a reactor plant—except for the then diminishing supply of plutonium left over from decades of thermal-reactor operation.¶ How does the IFR square with U.S. policy of discouraging plutonium production, reprocessing and use?¶ It is entirely consistent with the intent of that policy—to render plutonium as inaccessible for weapons use as possible. The wording of the policy, however, is now obsolete.¶ How so?¶ It was formulated before the IFR’s pyroprocessing and electrorefining technology was known—when “reprocessing” was synonymous with PUREX, which creates plutonium of the chemical purity needed for weapons. Since now there is a fuel cycle that promises to provide far-superior management of plutonium, the policy has been overtaken by events.¶ Why is the IFR better than PUREX? Doesn’t “recycling” mean separation of plutonium, regardless of the method?¶ No, not in the IFR—and that misunderstanding accounts for some of the opposition. The IFR’s pyroprocessing and electrorefining method is not capable of making plutonium that is pure enough for weapons. If a proliferator were to start with IFR material, he or she would have to employ an extra chemical separation step.¶ But there is plutonium in IFRs, along with other fissionable isotopes. Seems to me that a proliferator could take some of that and make a bomb.¶ Some people do say that, but they’re wrong, according to expert bomb designers at Livermore National Laboratory. They looked at the problem in detail, and concluded that plutonium-bearing material taken from anywhere in the IFR cycle was so ornery, because of inherent heat, radioactivity and spontaneous neutrons, that making a bomb with it without chemical separation of the plutonium would be essentially impossible—far, far harder than using today’s reactor-grade plutonium.¶ So? Why wouldn’t they use chemical separation?¶ First of all, they would need a PUREX-type plant—something that does not exist in the IFR cycle.¶ Second, the input material is so fiendishly radioactive that the processing facility would have to be more elaborate than any PUREX plant now in existence. The operations would have to be done entirely by remote control, behind heavy shielding, or the operators would die before getting the job done. The installation would cost millions, and would be very hard to conceal.¶ Third, a routine safeguards regime would readily spot any such modification to an IFR plant, or diversion of highly radioactive material beyond the plant.¶ Fourth, of all the ways there are to get plutonium—of any isotopic quality—this is probably the all-time, hands-down hardest.¶ The Long Term¶ Does the plutonium now existing and being produced by thermal reactors raise any proliferation concerns for the long term?¶ It certainly does. As I said earlier, burying the spent fuel from today’s thermal reactors creates geological deposits of plutonium whose desirability for weapons use is continually improving. Some 30 countries now have thermal-reactor programs, and the number will grow. To conceive of that many custodial programs being maintained effectively for that long is a challenge to the imagination. Since the IFR can consume plutonium, it can completely eliminate this long-term concern.¶ Are there other waste-disposal problems that could be lessened?¶ Yes. Some constituents of the waste from thermal reactors remain appreciably radioactive for thousands of years, leading to 10,000-year stability criteria for disposal sites. Waste disposal would be simpler if that time frame could be shortened. With IFR waste, the time of concern is less than 500 years.¶ What about a 1994 report by the National Academy of Sciences? The Washington Post said that the NAS report “denounces the idea of building new reactors to consume plutonium.”¶ That characterization of the report is a little strong, but it is true that the members of the NAS committee seem not to have been familiar with the plutonium-management potential of the IFR. They did, however, recognize the “plutonium mine” problem. They say (Executive Summary, p.3):¶ Because plutonium in spent fuel or glass logs incorporating high-level wastes still entails a risk of weapons use, and because the barrier to such use diminishes with time as the radioactivity decays, consideration of further steps to reduce the long-term proliferation risks of such materials is required, regardless of what option is chosen for [near-term] disposition of weapons plutonium. This global effort should include continued consideration of more proliferation-resistant nuclear fuel cycles, including concepts that might offer a long-term option for nearly complete elimination of the world’s plutonium stocks. The IFR, obviously, is just such a fuel cycle—a prime candidate for “continued consideration.”

#### We’re on the brink of rapid prolif – access to tech is inevitable and multilateral institutions fail

**ALLISON ’10** (Graham; Director – Belfer Center for Science and International Affairs and Douglas Dillon Professor of Government and Falcuty Chair – Dubai Initiative – Harvard Kennedy School, “Nuclear Disorder: Surveying Atomic Threats,” Foreign Affairs, Jan/Feb)

The global nuclear order today could be as fragile as the global financial order was two years ago, when conventional wisdom declared it to be sound, stable, and resilient. In the aftermath of the 1962 Cuban missile crisis, a confrontation that he thought had one chance in three of ending in nuclear war, U. S. President John F. Kennedy concluded that the nuclear order of the time posed unacceptable risks to mankind. "I see the possibility in the 1970s of the president of the United States having to face a world in which 15 or 20 or 25 nations may have these weapons," he forecast. "I regard that as the greatest possible danger." Kennedy's estimate reflected the general expectation that as nations acquired the advanced technological capability to build nuclear weapons, they would do so. Although history did not proceed along that trajectory, Kennedy's warning helped awaken the world to the intolerable dangers of unconstrained nuclear proliferation.

His conviction spurred a surge of diplomatic initiatives: a hot line between Washington and Moscow, a unilateral moratorium on nuclear testing, a ban on nuclear weapons in outer space. Refusing to accept the future Kennedy had spotlighted, the international community instead negotiated various international constraints, the centerpiece of which was the 1968 Nuclear Nonproliferation Treaty (NPT). Thanks to the nonproliferation regime, 184 nations, including more than 40 that have the technical ability to build nuclear arsenals, have renounced nuclear weapons. Four decades since the NPT was signed, there are only nine nuclear states. Moreover, for more than 60 years, no nuclear weapon has been used in an attack. In 2004, the secretary-general of the UN created a panel to review future threats to international peace and security. It identified nuclear Armageddon as the prime threat, warning, "We are approaching a point at which the erosion of the nonproliferation regime could become irreversible and result in a cascade of proliferation. " Developments since 2004 have only magnified the risks of an irreversible cascade.

The current global nuclear order is extremely fragile, and the three most urgent challenges to it are North Korea, Iran, and Pakistan. If North Korea and Iran become established nuclear weapons states over the next several years, the nonproliferation regime will have been hollowed out. If Pakistan were to lose control of even one nuclear weapon that was ultimately used by terrorists, that would change the world. It would transform life in cities, shrink what are now regarded as essential civil liberties, and alter conceptions of a viable nuclear order.

Henry Kissinger has noted that the defining challenge for statesmen is to recognize "a change in the international environment so likely to undermine a nation's security that it must be resisted no matter what form the threat takes or how ostensibly legitimate it appears. " The collapse of the existing nuclear order would constitute just such a change -- and the consequences would make nuclear terrorism and nuclear war so imminent that prudent statesmen must do everything feasible to prevent it.

The Nuclear Cascade

Seven storylines are advancing along crooked paths, each undermining the existing nuclear order. These comprise North Korea's expanding nuclear weapons program, Iran's continuing nuclear ambitions, Pakistan's increasing instability, al Qaeda's enduring remnant, growing cynicism about the nonproliferation regime, nuclear energy's renaissance, and the recent learning of lessons about the utility of nuclear weapons in international affairs.

Most of the foreign policy community has still not absorbed the facts about North Korean developments over the past eight years. One of the poorest and most isolated states on earth, North Korea had at most two bombs' worth of plutonium in 2001. Today, it has an arsenal of ten bombs and has conducted two nuclear weapons tests. It is currently harvesting the plutonium for an 11th bomb and restoring its reactor in Yongbyon, which has the capacity to produce a further two bombs' worth of plutonium a year. In addition, Pyongyang has repeatedly tested long-range missiles that are increasingly reliable, has proliferated nuclear technologies (including the sale of a Yongbyon-style reactor to Syria), and may be developing a second path to nuclear weapons by building a facility to enrich uranium.

From the perspective of the nuclear nonproliferation regime, two questions jump off the page. First, does Kim Jong Il imagine that he could get away with selling a nuclear weapon to Osama bin Laden or Iran? The fact that he sold Syria a plutonium-producing reactor suggests that he does. Second, what are the consequences for the NPT if one of the world's weakest states can violate the rules of the regime with impunity and defy the demands of the strongest states, which are those that are charged with its enforcement?

Already, North Korea's nuclear advances have triggered reflections in Seoul, Tokyo, and other regional capitals about options that were previously considered taboo. Although Japan's political culture is unambiguously against nuclear weapons, in 2002 then Prime Minister Junichiro Koizumi demonstrated how quickly that could change when he observed publicly, "It is significant that although we could have them, we don't. "And because Japan has a ready stockpile of nearly 2, 000 kilograms of highly enriched uranium and a well-developed missile program (for launching satellites), if Tokyo were to conclude that it required a credible nuclear deterrent of its own, it could adopt a serious nuclear weapons posture virtually overnight.

Meanwhile, Iran's nuclear odyssey is a moving target. Developments in the current negotiations may offer glimmers of hope. But it is unlikely that Iran will prove less obstinate and devious than North Korea has been. All the evidence suggests that Iran is methodically building up a widely dispersed array of mining, uranium-conversion, and uranium-enrichment facilities that could provide the infrastructure for nuclear weapons. At this point, it has mastered the technologies to indigenously manufacture, build, and operate its own centrifuges. Already, Iran is spinning 4, 500 centrifuges, which produce an average of six pounds of low-enriched uranium per day, and has installed an additional 3, 700 centrifuges that are ready to begin operation. The country now has a stockpile of over 3, 000 pounds of low-enriched uranium -enough, after further enrichment, to make two Hiroshima-type nuclear bombs. Moreover, as the outing of a previously secret enrichment facility at Qom makes evident, Iran has thought carefully about the threat of a military strike on its declared facility at Natanz. To hedge against that risk, it has likely constructed more than one covert enrichment plant -- facilities that would also provide a potential sneak-out option.

If Iran conducts a nuclear weapons test sometime in the next several years, it is probable that over the decade that follows, it will not be the only new nuclear weapons state in the Middle East. Saudi Arabia, for example, has insisted that it will not accept a future in which Iran -- its Shiite, Persian rival -- has nuclear weapons and it does not. Given the technical prerequisites, Saudi Arabia would much more likely be a buyer than a maker. Indeed, some in the U. S. intelligence community suspect that there have already been conversations between Saudi and Pakistani national security officials about the sale or transfer of an "Islamic bomb. " In the 1980s, Saudi Arabia secretly purchased from China 36 CSS-2 missiles, which have a range of 1, 500 miles and no plausible military use other than to carry nuclear warheads.

Egypt and Turkey could also follow in Iran's nuclear footsteps. As former U. S. National Security Adviser Brent Scowcroft testified to the Senate Foreign Relations Committee in March 2009, "We're on the cusp of an explosion of proliferation, and Iran is now the poster child. If Iran is allowed to go forward, in self-defense or for a variety of reasons, we could have half a dozen countries in the region and 20 or 30 more around the world doing the same thing just in case. "

#### Proliferation will be rapid and escalate – kills deterrence stability

**Horowitz, 2009**

[April, Michael, Department of Political Science, University of Pennsylvania, Philadelphia, “The Spread of Nuclear Weapons,” journal of conflict resolution, vol 53, no 2]

Learning as states gain experience with nuclear weapons is complicated. While to some extent, nuclear acquisition might provide information about resolve or capabil-  ities, it also generates uncertainty about the way an actual conflict would go—given  the new risk of nuclear escalation—and uncertainty about relative capabilities. Rapid proliferation may especially heighten uncertainty given the potential for reasonable  states to disagree at times about the quality of the capabilities each possesses.2 What  follows is an attempt to describe the implications of inexperience and incomplete  information on the behavior of nuclear states and their potential opponents over time.  Since it is impossible to detail all possible lines of argumentation and possible  responses, the following discussion is necessarily incomplete. This is a first step.  The acquisition of nuclear weapons increases the confidence of adopters in their  ability to impose costs in the case of a conflict and the expectations of likely costs if  war occurs by potential opponents. The key questions are whether nuclear states  learn over time about how to leverage nuclear weapons and the implications of that  learning, along with whether actions by nuclear states, over time, convey information  that leads to changes in the expectations of their behavior—shifts in uncertainty—  on the part of potential adversaries.  Learning to Leverage?  When a new state acquires nuclear weapons, how does it influence the way the  state behaves and how might that change over time? Although nuclear acquisition  might be orthogonal to a particular dispute, it might be related to a particular secu-  rity challenge, might signal revisionist aims with regard to an enduring dispute, or  might signal the desire to reinforce the status quo.  This section focuses on how acquiring nuclear weapons influences both the new  nuclear state and potential adversaries. In theory, system wide perceptions of nuclear  danger could allow new nuclear states to partially skip the early Cold War learning  process concerning the risks of nuclear war and enter a proliferated world more cog-  nizant of nuclear brinksmanship and bargaining than their predecessors. However,  each new nuclear state has to resolve its own particular civil–military issues surrounding operational control and plan its national strategy in light of its new capa-  bilities. Empirical research by Sagan (1993), Feaver (1992), and Blair (1993)  suggests that viewing the behavior of other states does not create the necessary tacit  knowledge; there is no substitute for experience when it comes to handling a nuclear  arsenal, even if experience itself cannot totally prevent accidents. Sagan contends  that civil–military instability in many likely new proliferators and pressures generated by the requirements to handle the responsibility of dealing with nuclear weapons  will skew decision making toward more offensive strategies (Sagan 1995). The ques-  tions surrounding Pakistan’s nuclear command and control suggest there is no magic  bullet when it comes to new nuclear powers’ making control and delegation decisions (Bowen and Wolvén 1999).  Sagan and others focus on inexperience on the part of new nuclear states as a key  behavioral driver. Inexperienced operators and the bureaucratic desire to “justify”  the costs spent developing nuclear weapons, combined with organizational biases  that may favor escalation to avoid decapitation—the “use it or lose it” mind-set—  may cause new nuclear states to adopt riskier launch postures, such as launch on  warning, or at least be perceived that way by other states (Blair 1993; Feaver 1992;  Sagan 1995).3  Acquiring nuclear weapons could alter state preferences and make states more  likely to escalate disputes once they start, given their new capabilities.4 But their  general lack of experience at leveraging their nuclear arsenal and effectively communicating nuclear threats could mean new nuclear states will be more likely to  select adversaries poorly and to find themselves in disputes with resolved adver-  saries that will reciprocate militarized challenges. The “nuclear experience” logic also suggests that more experienced nuclear states  should gain knowledge over time from nuclearized interactions that helps leaders  effectively identify the situations in which their nuclear arsenals are likely to make  a difference. Experienced nuclear states learn to select into cases in which their com-  parative advantage, nuclear weapons, is more likely to be effective, increasing the  probability that an adversary will not reciprocate.  Coming from a slightly different perspective, uncertainty about the consequences  of proliferation on the balance of power and the behavior of new nuclear states on  the part of their potential adversaries could also shape behavior in similar ways (Schelling 1966; Blainey 1988). While a stable and credible nuclear arsenal communicates clear information about the likely costs of conflict, in the short term,  nuclear proliferation is likely to increase uncertainty about the trajectory of a war,  the balance of power, and the preferences of the adopter.

#### Prolif is uneven – small arsenals don’t solve

Narang, 12 [VIPIN NARANG is an Assistant Professor of Political Science at MIT and member of MIT's Security Studies Program. He received his Ph.D. from the Department Journal of Conflict Resolution July 9, 2012 0022002712448909, p. sage Journals]

Conclusion¶ These findings have important implications for our understanding of nuclear deterrence and nuclear proliferation. First, they overturn a central belief in international relations and nuclear deterrence theory that the acquisition of even a minimal nuclear capability radically improves a regional state's ability to deter conventional conflict. The Cold War experience left it unclear as to what it precisely takes to deter conflict. The regional nuclear powers, however, which have had to face constrained decisions about how to allocate their deterrent power, illustrate that states must explicitly orient their nuclear forces to deter conventional conflict in order to expe- rience reduced attacks. The mere possession of nuclear weapons or even second- strike forces alone seems incapable of providing systematic deterrence against con- ventional attacks. There is no magical deterrent benefit against conventional conflict generated by existential, catalytic, or assured retaliatory postures.¶ To reap a significant deterrent effect against conventional conflict, regional states must—for better or worse—explicitly orient their nuclear forces to do so by adopting an asymmetric escalation posture. This posture undoubtedly carries with it other sig- nificant risks, such as severe command and control pressures and an attendant increase in the risk of inadvertent nuclear use (Sagan 1995). Furthermore, states with this posture have strong incentives to undermine the so-called nuclear tabooin order to keep their nuclear threats credible and may do so in ways that risk their own, or international, security (Tannenwald 2008). However, the findings in this article pro- vide a strong clue as to why states may be willing to run these risks: the significant deterrence benefit that this posture provides. All of this suggests that, theoretically, scholars should cease treating nuclear weapons states as equivalent. The fact that nuclear powers have adopted widely varying nuclear postures that have radically dif- ferent effects on international conflict calls for a revision to our thinking about how conflict can be deterred with nuclear weapons. ror policy makers, these findings suggest that, in addition to addressing a state s initial march toward nuclear weapons, more attention ought to be paid to how regional states operationalize their nuclear forces once they cross the threshold. If it is nuclear posture, not simply nuclear possession, that generates the patterns of regional conflict around a particular regional nuclear power, practitioners may need to reassess their expectations of the frequency and character of conflict in regions with nuclear powers. It also means that the march toward nuclearization, while important, is not the only process that can be targeted by nonproliferation efforts. Even after a regional power has obtained nuclear weapons, the international commu- nity may be able to shape a state's choice of posture. For example, the perceived availability of the United States as a patron state is critical to the selection of the cat- alytic posture. In other instances, there might also be good reasons and ways to push a regional power that is tempted to adopt an asymmetric escalation posture to adopt an assured retaliation posture instead, and minimize the emphasis it places on nuclear weapons for its day-to-day conventional defense (Sechser and Fuhrmann, n.d.).¶ The fundamental point is that nuclear postures matter. Nuclear weapons may deter, but they deter unequally**.** Moreover, both theoretically and empirically, it seems to take more to deter conventional conflict than is generally appreciated. This finding ought to influence how we think about the emerging nuclear landscape and about what it means for international conflict.¶

#### Nuclearization increases conflict risk

Kapur in ‘7 (S. Paul, Associate Prof. Strategic Research Department @ Naval War College, “Dangerous Deterrent: Nuclear Weapons Proliferation and Conflict in South Asia”, p. 169-171)

In this study, I have sought to determine the effects that India's and Pakistan's acquisition of nuclear weapons has had on the South Asian security environment, focusing specifically on proliferation's impact on conventional military stability in the region. I first showed, through a quantitative analysis of the historical record, that a positive correlation exists between progressing nuclear proliferation and militarized disputes in the region. I explained this correlation between proliferation and conventional instability through case studies that closely examined Indo-Pakistani conventional military behavior during three periods of time during the proliferation process: a nonnuclear period from 1972 through 1989; a de facto nuclear period from 1990 through May 1998; and an overt nuclear period from June 1998 through 2002.

I argued that conventional conflict became more frequent and severe as proliferation progressed because of India's and Pakistan's territorial preferences and relative military capabilities. Pakistan's conventional military weakness vis-a-vis India and its revisionist preferences regarding the territorial division of Kashmir created strong incentives for conventional Pakistani aggression. This was the case for two reasons. First, nuclear weapons, by deterring all-out Indian conventional retaliation, enabled the Pakistanis physically to challenge territorial boundaries in Kashmir. Second, the danger of conventional hostilities escalating to the nuclear level drew international attention, potentially enabling Pakistan to secure outside mediation of the Kashmir dispute and to achieve a more favorable territorial settlement in Kashmir than it could have gotten by itself.

India's conventional strength and status quo preferences regarding the territorial division of Kashmir, by contrast, meant that the acquisition of nuclear weapons did not create direct incentives for India to become more conventionally aggressive or to alter its military behavior in any significant manner. This was the case because the Indian government was largely satisfied on the issue of Kashmir and did not seek to alter territorial boundaries in the region. Therefore, the Indians had little motivation to engage in cross-border aggression, with or without nuclear weapons. In addition, because India was conventionally stronger than Pakistan, the acquisition of nuclear weapons did not enable the Indians to undertake any aggression that they could not have launched earlier with purely conventional forces. Thus, we saw increasingly aggressive Pakistani behavior as proliferation progressed, while nuclear weapons did not have much direct impact on Indian behavior—though, by encouraging Pakistani adventurism, nuclear weapons did drive India to adopt increasingly forceful approaches to dealing with Pakistan.

In the case studies, I demonstrated this logic's impact on the Indo-Pakistani security relationship since 1972. Specifically, I showed that the first, nonnuclear time period from 1972 through 1989 was relatively peaceful, with 186 of 216 months completely free of militarized conflict. I argued that this was the case for two main reasons. First, the Indian government was satisfied with the territorial division of the subcontinent after its victory in the Bangladesh War and had no reason to undertake any aggression against Pakistan. Second, although Pakistani leaders were dissatisfied with the division of the subcontinent following the Bangladesh War, in its weakened state, Pakistan could not risk action to alter territorial boundaries and thus generally avoided confrontation with India.

I showed that the second, de facto nuclear time period was considerably more volatile than the nonnuclear period, with militarized disputes occurring over five times more frequently than they did from 1972 through 1989. I argued that this decreased stability resulted largely from Pakistan's support for the anti-Indian insurgency in Kashmir. This involvement in the insurgency was encouraged by Pakistan's de facto nuclear weapons capacity, which enabled Pakistan to pursue a low-intensity conflict strategy in Kashmir while insulated from all-out Indian conventional retaliation.

I showed that during the third, overt nuclear time period, the frequency of militarized Indo-Pakistani disputes increased nearly 14 percent beyond what it had been during the de facto nuclear period. Additionally, conflict during the overt period escalated above the hostility levels reached in either the nonnuclear or the de facto nuclear periods, crossing the threshold of outright war in 1999. I explained that the overt acquisition of nuclear weapons gave the Pakistan government even greater confidence in its ability to alter the territorial status quo in Kashmir through conventional aggression without fear of full-scale Indian retaliation. Furthermore, Pakistani leaders believed that conflict between two openly nuclear powers would attract international attention to and mediation of the Kashmir dispute, possibly resulting in a settlement superior to any that Pakistan could have secured on its own.

The case studies thus explained the positive correlation between progressing nuclear proliferation and increased conventional conflict identified in the first section of this study and made clear the importance of territorial preferences and military capabilities to determining nuclear proliferation's impact on the behavior of new nuclear states. In the sections that follow, I discuss the theoretical and policy implications of these findings.

#### Prolif is linked to global structural violence

Biswas 1 [Shampa Biswas, Whitman College Politics Professor, December 2001, “Nuclear apartheid" as political position: race as a postcolonial resource?, Alternatives 26.4]

At one level, as Partha Chatterjee has pointed out, the concept of apartheid relates to a discourse about "democracy." (49) To use apartheid to designate the unequal distribution of nuclear resources then is also simultaneously to draw attention to the undemocratic character of international relations--or, more literally, the exclusion of a group of people from some kind of legitimate and just entitlement. More specifically, to talk in terms of nuclear haves and have-nots is to talk in terms of a concept of democratic justice based on the "possession" (or lack thereof) of something. "Apartheid," as Sumit Sarkar points out, "implies as its valorised Other a notion of equal rights." (50) But that this something is "nuclear weapons" complicates the issue a great deal. If the vision of democracy that is implicit in the concept of nuclear apartheid implies a world of "equal possession" of nuclear weapons, a position implied in the Indian decision to test, that is a frightening thought indeed. Yet surely even India does not subscribe to that vision of democracy. "Would India," asks Sarkar, "welcome a nuclearised Nepal or Bangladesh?" (51) If Jaswant Singh is serious that "the country"s national security in a world of nuclear proliferation lies either in global disarmament or in exercise of the principle of equal and legitimate security for all," (52) then it should indeed support the "equal and legitimate" nuclearization of its neighbors, which is extremely unlikely given its own demonstrated hegemonic aspirations in the South Asian region. (53) Further, if India does indeed now sign the NPT and the CTBT, and sign them in the garb of a nuclear power as it wants to do, what does that say about its commitment to nuclear democracy? Even if India and Pakistan were to be included in the treaties as NWSs, all that would do is expand the size of the categories, not delegitimize the unequal privileges and burdens written into the categories themselves. ¶ Indian military scientists claim that India has now accumulated enough data for reliable future weaponization without explosive testing, and Indian leaders have, since the tests, indicated more willingness to sign the CTBT. India has already voluntarily accepted restraints on the exports of nuclear-related materials, as required by the NPT. According to an Indian strategic analyst with respect to negotiation of the Fissile Material Cut-Off Treaty, the next major arms-control treaty to be discussed in the Conference on Disarmament, "The key question in relation to the FMCT is not if it is global and nondiscriminatory. It is whether India has sufficient nuclear material at hand to maintain a credible nuclear deterrent." (54) If all India ever wanted was to move from the side of the discriminated to the side of the discriminators, so much for speaking for democratic ideals through the symbol of nuclear apartheid. (55) ¶ There are several troublesome issues here with respect to the concept of "nuclear democracy." On the one hand, it seems clear that the widespread proliferation of nuclear weapons sits ill at ease with any notion of democratic entitlement. It seems that rather than equalizing the possession of nuclear weapons, **it would be equalizing the dispossession of nuclear weapons that entails a more compelling democratic logic.** (56) On the other hand, there is also the question of the fundamentally undemocratic nature of nuclear weapons themselves. At one level, the sheer scope of such weapons to kill and destroy indiscriminately (a democratic logic here?) renders any laws of 'just war" moot. As Braful Bidwai and Achin Vanaik point out, the very use of nuclear weapons would be to break the principle of proportionate use of force, and such weapons clearly cannot be made to distinguish between combatants and noncombatants as required in the just conduct of war. (57) ¶ In this context, it might be worth pointing to the 1996 ruling by the International Court of Justice at the Hague that stipulated that the "the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict and, in particular, the principles and rules of humanitarian law." (58) If the regulation of war can be considered a democratic exercise, then nuclear weapons by their very nature make that exercise futile. At another level is the secrecy that has historically and perhaps necessarily accompanied the development of nuclear-weapons programs, relegated to an aspect of the national-security state that is immunized from democratic scrutiny. Chatterjee argues that nuclear weapons involve a technology that is intrinsically undemocratic -- both domestically and internationally -- since the enormous destructive potential that they embody requires a great deal of secrecy and inaccessibility. (59) Itty Abraham's excellent analysis shows how the intertwined emergence of the independent Indian state and the atomic-energy establishment legally foreclosed the democratic and institutional oversight of the entire atomic-energy enterprise because of its proximity to national security. In other words, the state sponsorship and control of nuclear science, and indeed its constitution in and through nuclear science, makes both science and the state susceptible to undemocratic governance. (60)

#### Also risks human extinction

Krieger, ‘9

[David, Pres. Nuclear Age Peace Foundation and Councilor – World Future Council, “Still Loving the Bomb After All These Years”, 9-4, https://www.wagingpeace.org/articles/2009/09/04\_krieger\_newsweek\_response.php?krieger]

Jonathan Tepperman’s article in the September 7, 2009 issue of Newsweek, “Why Obama Should Learn to Love the Bomb,” provides a novel but frivolous argument that nuclear weapons “may not, in fact, make the world more dangerous….” Rather, in Tepperman’s world, “The bomb may actually make us safer.” Tepperman shares this world with Kenneth Waltz, a University of California professor emeritus of political science, who Tepperman describes as “the leading ‘nuclear optimist.’” Waltz expresses his optimism in this way: “We’ve now had 64 years of experience since Hiroshima. It’s striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states.” Actually, there were a number of proxy wars between nuclear weapons states, such as those in Korea, Vietnam and Afghanistan, and some near disasters, the most notable being the 1962 Cuban Missile Crisis. Waltz’s logic is akin to observing a man falling from a high rise building, and noting that he had already fallen for 64 floors without anything bad happening to him, and concluding that so far it looked so good that others should try it. Dangerous logic! Tepperman builds upon Waltz’s logic, and concludes “that all states are rational,” even though their leaders may have a lot of bad qualities, including being “stupid, petty, venal, even evil….” He asks us to trust that rationality will always prevail when there is a risk of nuclear retaliation, because these weapons make “the costs of war obvious, inevitable, and unacceptable.” Actually, he is asking us to do more than trust in the rationality of leaders; he is asking us to gamble the future on this proposition. “The iron logic of deterrence and mutually assured destruction is so compelling,” Tepperman argues, “it’s led to what’s known as the nuclear peace….” But if this is a peace worthy of the name, which it isn’t, it certainly is not one on which to risk the future of civilization. One irrational leader with control over a nuclear arsenal could start a nuclear conflagration, resulting in a global Hiroshima. Tepperman celebrates “the iron logic of deterrence,” but deterrence is a theory that is far from rooted in “iron logic.” It is a theory based upon threats that must be effectively communicated and believed. Leaders of Country A with nuclear weapons must communicate to other countries (B, C, etc.) the conditions under which A will retaliate with nuclear weapons. The leaders of the other countries must understand and believe the threat from Country A will, in fact, be carried out. The longer that nuclear weapons are not used, the more other countries may come to believe that they can challenge Country A with impunity from nuclear retaliation. The more that Country A bullies other countries, the greater the incentive for these countries to develop their own nuclear arsenals. Deterrence is unstable and therefore precarious. Most of the countries in the world reject the argument, made most prominently by Kenneth Waltz, that the spread of nuclear weapons makes the world safer. These countries joined together in the Nuclear Non-Proliferation Treaty (NPT) to prevent the spread of nuclear weapons, but they never agreed to maintain indefinitely a system of nuclear apartheid in which some states possess nuclear weapons and others are prohibited from doing so. The principal bargain of the NPT requires the five NPT nuclear weapons states (US, Russia, UK, France and China) to engage in good faith negotiations for nuclear disarmament, and the International Court of Justice interpreted this to mean complete nuclear disarmament in all its aspects. Tepperman seems to be arguing that seeking to prevent the proliferation of nuclear weapons is bad policy, and that nuclear weapons, because of their threat, make efforts at non-proliferation unnecessary and even unwise. If some additional states, including Iran, developed nuclear arsenals, he concludes that wouldn’t be so bad “given the way that bombs tend to mellow behavior.” Those who oppose Tepperman’s favorable disposition toward the bomb, he refers to as “nuclear pessimists.” These would be the people, and I would certainly be one of them, who see nuclear weapons as presenting an urgent danger to our security, our species and our future. Tepperman finds that when viewed from his “nuclear optimist” perspective, “nuclear weapons start to seem a lot less frightening.” “Nuclear peace,” he tells us, “rests on a scary bargain: you accept a small chance that something extremely bad will happen in exchange for a much bigger chance that something very bad – conventional war – won’t happen.” But the “extremely bad” thing he asks us to accept is the end of the human species. Yes, that would be serious. He also doesn’t make the case that in a world without nuclear weapons, the prospects of conventional war would increase dramatically. After all, it is only an unproven supposition that nuclear weapons have prevented wars, or would do so in the future. We have certainly come far too close to the precipice of catastrophic nuclear war. As an ultimate celebration of the faulty logic of deterrence, Tepperman calls for providing any nuclear weapons state with a “survivable second strike option.” Thus, he not only favors nuclear weapons, but finds the security of these weapons to trump human security. Presumably he would have President Obama providing new and secure nuclear weapons to North Korea, Pakistan and any other nuclear weapons states that come along so that they will feel secure enough not to use their weapons in a first-strike attack. Do we really want to bet the human future that Kim Jong-Il and his successors are more rational than Mr. Tepperman?

### Warming

#### Warming is real and anthropogenic – carbon dioxide increase, polar ice records, melting glaciers, sea level rise

**Prothero 12** [Donald R. Prothero, Professor of Geology at Occidental College and Lecturer in Geobiology at the California Institute of Technology, 3-1-2012, "How We Know Global Warming is Real and Human Caused," Skeptic, vol 17 no 2, EBSCO]

Converging Lines of Evidence¶ How do we know that global warming is real and primarily human caused? There are numerous lines of evidence that converge toward this conclusion.¶ 1. Carbon Dioxide Increase.¶ Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Little Ice Age in die 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, die timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil.¶ 2. Melting Polar Ice Caps.¶ The polar icecaps are thinning and breaking up at an alarming rate. In 2000, my former graduate advisor Malcolm McKenna was one of the first humans to fly over the North Pole in summer time and see no ice, just open water. The Arctic ice cap has been frozen solid for at least the past 3 million years (and maybe longer),4 but now the entire ice sheet is breaking up so fast that by 2030 (and possibly sooner) less than half of the Arctic will be ice covered in the summer.5 As one can see from watching the news, this is an ecological disaster for everything that lives up there, from the polar bears to the seals and walruses to the animals they feed upon, to the 4 million people whose world is melting beneath their feet. The Antarctic is thawing even faster. In February-March 2002, the Larsen B ice shelf - over 3000 square km (the size of Rhode Island) and 220 m (700 feet) thick- broke up in just a few months, a story typical of nearly all the ice shelves in Antarctica. The Larsen B shelf had survived all the previous ice ages and interglacial warming episodes over the past 3 million years, and even the warmest periods of the last 10,000 years- yet it and nearly all the other thick ice sheets on the Arctic, Greenland, and Antarctic are vanishing at a rate never before seen in geologic history.¶ 3. Melting Glaciers.¶ Glaciers are all retreating at the highest rates ever documented. Many of those glaciers, along with snow melt, especially in the Himalayas, Andes, Alps, and Sierras, provide most of the freshwater that the populations below the mountains depend upon - yet this fresh water supply is vanishing. Just think about the percentage of world's population in southern Asia (especially India) that depend on Himalayan snowmelt for their fresh water. The implications are staggering. The permafrost that once remained solidly frozen even in the summer has now Üiawed, damaging the Inuit villages on the Arctic coast and threatening all our pipelines to die North Slope of Alaska. This is catastrophic not only for life on the permafrost, but as it thaws, the permafrost releases huge amounts of greenhouse gases which are one of the major contributors to global warming. Not only is the ice vanishing, but we have seen record heat waves over and over again, killing thousands of people, as each year joins the list of the hottest years on record. (2010 just topped that list as the hottest year, surpassing the previous record in 2009, and we shall know about 2011 soon enough). Natural animal and plant populations are being devastated all over the globe as their environments change.6 Many animals respond by moving their ranges to formerly cold climates, so now places that once did not have to worry about disease-bearing mosquitoes are infested as the climate warms and allows them to breed further north.¶ 4. Sea Level Rise.¶ All that melted ice eventually ends up in the ocean, causing sea levels to rise, as it has many times in the geologic past. At present, the sea level is rising about 3-4 mm per year, more than ten times the rate of 0.10.2 mm/year that has occurred over the past 3000 years. Geological data show Üiat ttie sea level was virtually unchanged over the past 10,000 years since the present interglacial began. A few mm here or there doesn't impress people, until you consider that the rate is accelerating and that most scientists predict sea levels will rise 80-130 cm in just the next century. A sea level rise of 1.3 m (almost 4 feet) would drown many of the world's low-elevation cities, such as Venice and New Orleans, and low-lying countries such as the Netherlands or Bangladesh. A number of tiny island nations such as Vanuatu and the Maldives, which barely poke out above the ocean now, are already vanishing beneath the waves. Eventually their entire population will have to move someplace else.7 Even a small sea level rise might not drown all these areas, but they are much more vulnerable to the large waves of a storm surge (as happened with Hurricane Katrina), which could do much more damage than sea level rise alone. If sea level rose by 6 m (20 feet), most of die world's coastal plains and low-lying areas (such as the Louisiana bayous, Florida, and most of the world's river deltas) would be drowned.¶ Most of the world's population lives in lowelevation coastal cities such as New York, Boston, Philadelphia, Baltimore, Washington, D.C., Miami, and Shanghai. All of those cities would be partially or completely under water with such a sea level rise. If all the glacial ice caps melted completely (as they have several times before during past greenhouse episodes in the geologic past), sea level would rise by 65 m (215 feet)! The entire Mississippi Valley would flood, so you could dock an ocean liner in Cairo, Illinois. Such a sea level rise would drown nearly every coastal region under hundreds of feet of water, and inundate New York City, London and Paris. All that would remain would be the tall landmarks such as the Empire State Building, Big Ben, and the Eiffel Tower. You could tie your boats to these pinnacles, but the rest of these drowned cities would lie deep underwater.

#### Strong scientific consensus agrees warming is human caused and we’re approaching the tipping point

**Morgan 9 –** Professor of Current Affairs @ Hankuk University of Foreign Studies, South Korea(Dennis Ray, “World on fire: two scenarios of the destruction of human civilization and possible extinction of the human race”, Futures, Volume 41, Issue 10, December 2009, Pages 683-693, ScienceDirect)

As horrifying as the scenario of human extinction by sudden, fast-burning nuclear fire may seem, the one consolation is that this future can be avoided within a relatively short period of time if responsible world leaders change Cold War thinking to move away from aggressive wars over natural resources and towards the eventual dismantlement of most if not all nuclear weapons. On the other hand, another scenario of human extinction by fire is one that may not so easily be reversed within a short period of time because it is not a fast-burning fire; rather, a slow burning fire is gradually heating up the planet as industrial civilization progresses and develops globally. This gradual process and course is long-lasting; thus it cannot easily be changed, even if responsible world leaders change their thinking about ‘‘progress’’ and industrial development based on the burning of fossil fuels. The way that global warming will impact humanity in the future has often been depicted through the analogy of the proverbial frog in a pot of water who does not realize that the temperature of the water is gradually rising. Instead of trying to escape, the frog tries to adjust to the gradual temperature change; finally, the heat of the water sneaks up on it until it is debilitated. Though it finally realizes its predicament and attempts to escape, it is too late; its feeble attempt is to no avail— and the frog dies. Whether this fable can actually be applied to frogs in heated water or not is irrelevant; it still serves as a comparable scenario of how the slow burning fire of global warming may eventually lead to a runaway condition and take humanity by surprise. Unfortunately, by the time the politicians finally all agree with the scientific consensus that global warming is indeed human caused, its development could be too advanced to arrest; the poor frog has become too weak and enfeebled to get himself out of hot water. The Intergovernmental Panel of Climate Change (IPCC) was established in 1988 by the WorldMeteorological Organization (WMO) and the United Nations Environmental Programme to ‘‘assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of humaninduced climate change, its potential impacts and options for adaptation and mitigation.’’[16]. Since then, it has given assessments and reports every six or seven years. Thus far, it has given four assessments.13 With all prior assessments came attacks fromsome parts of the scientific community, especially by industry scientists, to attempt to prove that the theory had no basis in planetary history and present-day reality; nevertheless, as more andmore research continually provided concrete and empirical evidence to confirm the global warming hypothesis, that it is indeed human-caused, mostly due to the burning of fossil fuels, the scientific consensus grew stronger that human induced global warming is verifiable. As a matter of fact, according to Bill McKibben [17], 12 years of ‘‘impressive scientific research’’ strongly confirms the 1995 report ‘‘that humans had grown so large in numbers and especially in appetite for energy that they were now damaging the most basic of the earth’s systems—the balance between incoming and outgoing solar energy’’; ‘‘. . . their findings have essentially been complementary to the 1995 report – a constant strengthening of the simple basic truth that humans were burning too much fossil fuel.’’ [17]. Indeed, 12 years later, the 2007 report not only confirms global warming, with a stronger scientific consensus that the slow burn is ‘‘very likely’’ human caused, but it also finds that the ‘‘amount of carbon in the atmosphere is now increasing at a faster rate even than before’’ and the temperature increases would be ‘‘considerably higher than they have been so far were it not for the blanket of soot and other pollution that is temporarily helping to cool the planet.’’ [17]. Furthermore, almost ‘‘everything frozen on earth is melting. Heavy rainfalls are becoming more common since the air is warmer and therefore holds more water than cold air, and ‘cold days, cold nights and frost have become less frequent, while hot days, hot nights, and heat waves have become more frequent.’’ [17]. Unless drastic action is taken soon, the average global temperature is predicted to rise about 5 degrees this century, but it could rise as much as 8 degrees. As has already been evidenced in recent years, the rise in global temperature is melting the Arctic sheets. This runaway polar melting will inflict great damage upon coastal areas, which could be much greater than what has been previously forecasted. However, what is missing in the IPCC report, as dire as it may seem, is sufficient emphasis on the less likely but still plausible worst case scenarios, which could prove to have the most devastating, catastrophic consequences for the long-term future of human civilization. In other words, the IPCC report places too much emphasis on a linear progression that does not take sufficient account of the dynamics of systems theory, which leads to a fundamentally different premise regarding the relationship between industrial civilization and nature. As a matter of fact, as early as the 1950s, Hannah Arendt [18] observed this radical shift of emphasis in the human-nature relationship, which starkly contrasts with previous times because the very distinction between nature and man as ‘‘Homo faber’’ has become blurred, as man no longer merely takes from nature what is needed for fabrication; instead, he now acts into nature to augment and transform natural processes, which are then directed into the evolution of human civilization itself such that we become a part of the very processes that we make. The more human civilization becomes an integral part of this dynamic system, the more difficult it becomes to extricate ourselves from it. As Arendt pointed out, this dynamism is dangerous because of its unpredictability. Acting into nature to transform natural processes brings about an . . . endless new change of happenings whose eventual outcome the actor is entirely incapable of knowing or controlling beforehand. The moment we started natural processes of our own - and the splitting of the atom is precisely such a man-made natural process -we not only increased our power over nature, or became more aggressive in our dealings with the given forces of the earth, but for the first time have taken nature into the human world as such and obliterated the defensive boundaries between natural elements and the human artifice by which all previous civilizations were hedged in’’ [18]. So, in as much as we act into nature, we carry our own unpredictability into our world; thus, Nature can no longer be thought of as having absolute or iron-clad laws. We no longer know what the laws of nature are because the unpredictability of Nature increases in proportion to the degree by which industrial civilization injects its own processes into it; through selfcreated, dynamic, transformative processes, we carry human unpredictability into the future with a precarious recklessness that may indeed end in human catastrophe or extinction, for elemental forces that we have yet to understand may be unleashed upon us by the very environment that we experiment with. Nature may yet have her revenge and the last word, as the Earth and its delicate ecosystems, environment, and atmosphere reach a tipping point, which could turn out to be a point of no return. This is exactly the conclusion reached by the scientist, inventor, and author, James Lovelock. The creator of the wellknown yet controversial Gaia Theory, Lovelock has recently written that it may be already too late for humanity to change course since climate centers around the world, . . . which are the equivalent of the pathology lab of a hospital, have reported the Earth’s physical condition, and the climate specialists see it as seriously ill, and soon to pass into a morbid fever that may last as long as 100,000 years. I have to tell you, as members of the Earth’s family and an intimate part of it, that you and especially civilisation are in grave danger. It was ill luck that we started polluting at a time when the sun is too hot for comfort. We have given Gaia a fever and soon her condition will worsen to a state like a coma. She has been there before and recovered, but it took more than 100,000 years. We are responsible and will suffer the consequences: as the century progresses, the temperature will rise 8 degrees centigrade in temperate regions and 5 degrees in the tropics. Much of the tropical land mass will become scrub and desert, and will no longer serve for regulation; this adds to the 40 per cent of the Earth’s surface we have depleted to feed ourselves. . . . Curiously, aerosol pollution of the northern hemisphere reduces global warming by reflecting sunlight back to space. This ‘global dimming’ is transient and could disappear in a few days like the smoke that it is, leaving us fully exposed to the heat of the global greenhouse. We are in a fool’s climate, accidentally kept cool by smoke, and before this century is over billions of us will die and the few breeding pairs of people that survive will be in the Arctic where the climate remains tolerable. [19] Moreover, Lovelock states that the task of trying to correct our course is hopelessly impossible, for we are not in charge. It is foolish and arrogant to think that we can regulate the atmosphere, oceans and land surface in order to maintain the conditions right for life. It is as impossible as trying to regulate your own temperature and the composition of your blood, for those with ‘‘failing kidneys know the never-ending daily difficulty of adjusting water, salt and protein intake. The technological fix of dialysis helps, but is no replacement for living healthy kidneys’’ [19]. Lovelock concludes his analysis on the fate of human civilization and Gaia by saying that we will do ‘‘our best to survive, but sadly I cannot see the United States or the emerging economies of China and India cutting back in time, and they are the main source of emissions. The worst will happen and survivors will have to adapt to a hell of a climate’’ [19]. Lovelock’s forecast for climate change is based on a systems dynamics analysis of the interaction between humancreated processes and natural processes. It is a multidimensional model that appropriately reflects the dynamism of industrial civilization responsible for climate change. For one thing, it takes into account positive feedback loops that lead to ‘‘runaway’’ conditions. This mode of analysis is consistent  with recent research on how ecosystems suddenly disappear. A 2001 article in Nature, based on a scientific study by an international consortium, reported that changes in ecosystems are not just gradual but are often sudden and catastrophic [20]. Thus, a scientific consensus is emerging (after repeated studies of ecological change) that ‘‘stressed ecosystems, given the right nudge, are capable of slipping rapidly from a seemingly steady state to something entirely different,’’ according to Stephen Carpenter, a limnologist at the University of Wisconsin-Madison (who is also a co-author of the report). Carpenter continues, ‘‘We realize that there is a common pattern we’re seeing in ecosystems around the world, . . . Gradual changes in vulnerability accumulate and eventually you get a shock to the system - a flood or a drought - and, boom, you’re over into another regime. It becomes a self-sustaining collapse.’’ [20]. If ecosystems are in fact mini-models of the system of the Earth, as Lovelock maintains, then we can expect the same kind of behavior. As Jonathon Foley, a UW-Madison climatologist and another co-author of the Nature report, puts it, ‘‘Nature isn’t linear. Sometimes you can push on a system and push on a system and, finally, you have the straw that breaks the camel’s back.’’ Also, once the ‘‘flip’’ occurs, as Foley maintains, then the catastrophic change is ‘‘irreversible.’’ [20]. When we expand this analysis of ecosystems to the Earth itself, it’s frightening. What could be the final push on a stressed system that could ‘‘break the camel’s back?’’ Recently, another factor has been discovered in some areas of the arctic regions, which will surely compound the problem of global ‘‘heating’’ (as Lovelock calls it) in unpredictable and perhaps catastrophic ways. This disturbing development, also reported in Nature, concerns the permafrost that has locked up who knows how many tons of the greenhouse gasses, methane and carbon dioxide. Scientists are particularly worried about permafrost because, as it thaws, it releases these gases into the atmosphere, thus, contributing and accelerating global heating. It is a vicious positive feedback loop that compounds the prognosis of global warming in ways that could very well prove to be the tipping point of no return. Seth Borenstein of the Associated Press describes this disturbing positive feedback loop of permafrost greenhouse gasses, as when warming ‘‘. already under way thaws permafrost, soil that has been continuously frozen for thousands of years. Thawed permafrost releases methane and carbon dioxide. Those gases reach the atmosphere and help trap heat on Earth in the greenhouse effect. The trapped heat thaws more permafrost and so on.’’ [21]. The significance and severity of this problem cannot be understated since scientists have discovered that ‘‘the amount of carbon trapped in this type of permafrost called ‘‘yedoma’’ is much more prevalent than originally thought and may be 100 times [my emphasis] the amount of carbon released into the air each year by the burning of fossil fuels’’ [21]. Of course, it won’t come out all at once, at least by time as we commonly reckon it, but in terms of geological time, the ‘‘several decades’’ that scientists say it will probably take to come out can just as well be considered ‘‘all at once.’’ Surely, within the next 100 years, much of the world we live in will be quite hot and may be unlivable, as Lovelock has predicted. Professor Ted Schuur, a professor of ecosystem ecology at the University of Florida and co-author of the study that appeared in Science, describes it as a ‘‘slow motion time bomb.’’ [21]. Permafrost under lakes will be released as methane while that which is under dry ground will be released as carbon dioxide. Scientists aren’t sure which is worse. Whereas methane is a much more powerful agent to trap heat, it only lasts for about 10 years before it dissipates into carbon dioxide or other chemicals. The less powerful heat-trapping agent, carbon dioxide, lasts for 100 years [21]. Both of the greenhouse gasses present in permafrost represent a global dilemma and challenge that compounds the effects of global warming and runaway climate change. The scary thing about it, as one researcher put it, is that there are ‘‘lots of mechanisms that tend to be self-perpetuating and relatively few that tend to shut it off’’ [21].14 In an accompanying AP article, Katey Walters of the University of Alaska at Fairbanks describes the effects as ‘‘huge’’ and, unless we have a ‘‘major cooling,’’ - unstoppable [22]. Also, there’s so much more that has not even been discovered yet, she writes: ‘‘It’s coming out a lot and there’s a lot more to come out.’’ [22]. 4. Is it the end of human civilization and possible extinction of humankind? What Jonathon Schell wrote concerning death by the fire of nuclear holocaust also applies to the slow burning death of global warming: Once we learn that a holocaust might lead to extinction**, we have no right to gamble**, because if we lose, the game will be over, and neither we nor anyone else will ever get another chance. Therefore, although, scientifically speaking, there is all the difference in the world between the mere possibility that a holocaust will bring about extinction and the certainty of it, morally they are the same, and we have no choice but to address the issue of nuclear weapons as though we knew for a certainty that their use would put an end to our species [23].15 When we consider that beyond the horror of nuclear war, another horror is set into motion to interact with the subsequent nuclear winter to produce a poisonous and super heated planet, the chances of human survival seem even smaller. Who knows, even if some small remnant does manage to survive, what the poisonous environmental conditions would have on human evolution in the future. A remnant of mutated, sub-human creatures might survive such harsh conditions, but for all purposes, human civilization has been destroyed, and the question concerning human extinction becomes moot. Thus, **we have no other choice but to consider the finality of it all**, as Schell does: ‘‘Death lies at the core of each person’s private existence, but part of death’s meaning is to be found in the fact that it occurs in a biological and social world that survives.’’ [23].16 But what if the world itself were to perish, Schell asks. Would not it bring about a sort of ‘‘second death’’ – the death of the species – a possibility that the vast majority of the human race is in denial about? Talbot writes in the review of Schell’s book that it is not only the ‘‘death of the species, not just of the earth’s population on doomsday, but of countless unborn generations. They would be spared literal death but would nonetheless be victims . . .’’ [23]. That is the ‘‘second death’’ of humanity – the horrifying, unthinkable prospect that there are no prospects – that there will be no future. In the second chapter of Schell’s book, he writes that since we have not made a positive decision to exterminate ourselves but instead have ‘‘chosen to live on the edge of extinction, periodically lunging toward the abyss only to draw back at the last second, our situation is one of uncertainty and nervous insecurity rather than of absolute hopelessness.’’ [23].17 In other words, the fate of the Earth and its inhabitants has not yet been determined. Yet time is not on our side. Will we relinquish the fire and our use of it to dominate the Earth and each other, or will we continue to gamble with our future at this game of Russian roulette while **time** increasingly **stacks the cards against** our chances of **survival**?

#### Warming causes ocean acidification and collapse – extinction

**Sify 2010 –** Sydney newspaper citing Ove Hoegh-Guldberg, professor at University of Queensland and Director of the Global Change Institute, and John Bruno, associate professor of Marine Science at UNC (Sify News, “Could unbridled climate changes lead to human extinction?”, <http://www.sify.com/news/could-unbridled-climate-changes-lead-to-human-extinction-news-international-kgtrOhdaahc.html>, WEA)

The findings of the comprehensive report: 'The impact of climate change on the world's marine ecosystems' emerged from a synthesis of recent research on the world's oceans, carried out by two of the world's leading marine scientists. One of the authors of the report is Ove Hoegh-Guldberg, professor at The University of Queensland and the director of its Global Change Institute (GCI). 'We may see sudden, unexpected changes that have serious ramifications for the overall well-being of humans, including the capacity of the planet to support people. This is further evidence that we are well on the way to the next great extinction event,' says Hoegh-Guldberg. 'The findings have enormous implications for mankind, particularly if the trend continues. The earth's ocean, which produces half of the oxygen we breathe and absorbs 30 per cent of human-generated carbon dioxide, is equivalent to its heart and lungs. This study shows worrying signs of ill-health. It's as if the earth has been smoking two packs of cigarettes a day!,' he added. 'We are entering a period in which the ocean services upon which humanity depends are undergoing massive change and in some cases beginning to fail', he added. The 'fundamental and comprehensive' changes to marine life identified in the report include rapidly warming and acidifying oceans, changes in water circulation and expansion of dead zones within the ocean depths. These are driving major changes in marine ecosystems: less abundant coral reefs, sea grasses and mangroves (important fish nurseries); fewer, smaller fish; a breakdown in food chains; changes in the distribution of marine life; and more frequent diseases and pests among marine organisms. Study co-author John F Bruno, associate professor in marine science at The University of North Carolina, says greenhouse gas emissions are modifying many physical and geochemical aspects of the planet's oceans, in ways 'unprecedented in nearly a million years'. 'This is causing fundamental and comprehensive changes to the way marine ecosystems function,' Bruno warned, according to a GCI release. These findings were published in Science

#### And warming disproportionately affects the global South

Carrington 11 – Head of the environment at The Guardian (Damian, “Map reveals stark divide in who caused climate change and who's being hit”, http://www.guardian.co.uk/environment/damian-carrington-blog/2011/oct/26/climate-change-developing-country-impacts-risk?CMP=twt\_gu, October 26th, 2011, KTOP)

When the world's nations convene in Durban in November in the latest attempt to inch towards a global deal to tackle climate change, one fundamental principle will, as ever, underlie the negotiations. Is is the contention that while rich, industrialised nations caused climate change through past carbon emissions, it is the developing world that is bearing the brunt. It follows from that, developing nations say, that the rich nations must therefore pay to enable the developing nations to both develop cleanly and adapt to the impacts of global warming. The point is starkly illustrated in a new map of climate vulnerability (above): the rich global north has low vulnerability, the poor global south has high vulnerability. The map is produced by risk analysts Maplecroft by combining measures of the risk of climate change impacts, such as storms, floods, and droughts, with the social and financial ability of both communities and governments to cope. The top three most vulnerable nations reflect all these factors: Haiti, Bangladesh, Zimbabwe. But it is not until you go all the way down 103 on the list, out of 193 nations, that you encounter the first major developed nation: Greece. The first 102 nations are all developing ones. Italy is next, at 124, and like Greece ranks relatively highly due to the risk of drought. The UK is at 178 and the country on Earth least vulnerable to climate change, according to Maplecroft, is Iceland. "Large areas of north America and northern Europe are not so exposed to actual climate risk, and are very well placed to deal with it," explains Charlie Beldon, principal analyst at Maplecroft. The vulnerability index has been calculated down to a resolution of 25km2 and Beldon says at this scale the vulnerability of the developing world's fast growing cities becomes clear. "A lot of big cities have developed in exposed areas such as flood plains, such as in south east Asia, and in developing economies they so don't have the capacity to adapt." Of the world's 20 fastest growing cities, six are classified as 'extreme risk' by Maplecroft, including Calcutta in India, Manila in the Philippines, Jakarta in Indonesia and Dhaka and Chittagong in Bangladesh. Addis Ababa in Ethiopia also features. A further 10 are rated as 'high risk' including Guangdong, Mumbai, Delhi, Chennai, Karachi and Lagos. "Cities such as Manila, Jakarta and Calcutta are vital centres of economic growth in key emerging markets, but heat waves, flooding, water shortages and increasingly severe and frequent storm events may well increase as climate changes takes hold," says Beldon. With the world on the verge of a population of seven billion people, the rapid urbanisation of many developing countries remains one of the major demographic trends, but piles on risk because of the higher pressure on resources, such as water, and city infrastructure, like roads and hospitals.

#### The IFR is the only way to reduce coal emissions sufficiently to avert the worst climate disasters

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "Why We Should Build an Integral Fast Reactor Now," 11/25/9) http://skirsch.wordpress.com/2009/11/25/ifr/

To prevent a climate disaster, we must eliminate virtually all coal plant emissions worldwide in 25 years. The best way and, for all practical purposes, the only way to get all countries off of coal is not with coercion; it is to make them want to replace their coal burners by giving them a plug-compatible technology that is less expensive. The IFR can do this. It is plug-compatible with the burners in a coal plant (see Nuclear Power: Going Fast). No other technology can upgrade a coal plant so it is greenhouse gas free while reducing operating costs at the same time. In fact, no other technology can achieve either of these goals. The IFR can achieve both.¶ The bottom line is that without the IFR (or a yet-to-be-invented technology with similar ability to replace the coal burner with a cheaper alternative), it is unlikely that we’ll be able to keep CO2 under 450 ppm.¶ Today, the IFR is the only technology with the potential to displace the coal burner. That is why restarting the IFR is so critical and why Jim Hansen has listed it as one of the top five things we must do to avert a climate disaster.[4]¶ Without eliminating virtually all coal emissions by 2030, the sum total of all of our other climate mitigation efforts will be inconsequential. Hansen often refers to the near complete phase-out of carbon emissions from coal plants worldwide by 2030 as the sine qua non for climate stabilization (see for example, the top of page 6 in his August 4, 2008 trip report).¶ To stay under 450ppm, we would have to install about 13,000 GWe of new carbon-free power over the next 25 years. That number was calculated by Nathan Lewis of Caltech for the Atlantic, but others such as Saul Griffith have independently derived a very similar number and White House Science Advisor John Holdren used 5,600 GWe to 7,200 GWe in his presentation to the Energy Bar Association Annual Meeting on April 23, 2009. That means that if we want to save the planet, we must install more than 1 GWe per day of clean power every single day for the next 25 years. That is a very, very tough goal. It is equivalent to building one large nuclear reactor per day, or 1,500 huge wind turbines per day, or 80,000 37 foot diameter solar dishes covering 100 square miles every day, or some linear combination of these or other carbon free power generation technologies. Note that the required rate is actually higher than this because Hansen and Rajendra Pachauri, the chair of the IPCC, now both agree that 350ppm is a more realistic “not to exceed” number (and we’ve already exceeded it).¶ Today, we are nowhere close to that installation rate with renewables alone. For example, in 2008, the average power delivered by solar worldwide was only 2 GWe (which is to be distinguished from the peak solar capacity of 13.4GWe). That is why every renewable expert at the 2009 Aspen Institute Environment Forum agreed that nuclear must be part of the solution. Al Gore also acknowledges that nuclear must play an important role.¶ Nuclear has always been the world’s largest source of carbon free power. In the US, for example, even though we haven’t built a new nuclear plant in the US for 30 years, nuclear still supplies 70% of our clean power!¶ Nuclear can be installed very rapidly; much more rapidly than renewables. For example, about two thirds of the currently operating 440 reactors around the world came online during a 10 year period between 1980 and 1990. So our best chance of meeting the required installation of new power goal and saving the planet is with an aggressive nuclear program.¶ Unlike renewables, nuclear generates base load power, reliably, regardless of weather. Nuclear also uses very little land area. It does not require the installation of new power lines since it can be installed where the power is needed. However, even with a very aggressive plan involving nuclear, it will still be extremely difficult to install clean power fast enough.¶ Unfortunately, even in the US, we have no plan to install the clean power we need fast enough to save the planet. Even if every country were to agree tomorrow to completely eliminate their coal plant emissions by 2030, how do we think they are actually going to achieve that? There is no White House plan that explains this. There is no DOE plan. There is no plan or strategy. The deadlines will come and go and most countries will profusely apologize for not meeting their goals, just like we have with most of the signers of the Kyoto Protocol today. Apologies are nice, but they will not restore the environment.¶ We need a strategy that is believable, practical, and affordable for countries to adopt. The IFR offers our best hope of being a centerpiece in such a strategy because it the only technology we know of that can provide an economically compelling reason to change.¶ At a speech at MIT on October 23, 2009, President Obama said “And that’s why the world is now engaged in a peaceful competition to determine the technologies that will power the 21st century. … The nation that wins this competition will be the nation that leads the global economy. I am convinced of that. And I want America to be that nation, it’s that simple.”¶ Nuclear is our best clean power technology and the IFR is our best nuclear technology. The Gen IV International Forum (GIF) did a study in 2001-2002 of 19 different reactor designs on 15 different criteria and 24 metrics. The IFR ranked #1 overall. Over 242 experts from around the world participated in the study. It was the most comprehensive evaluation of competitive nuclear designs ever done. Top DOE nuclear management ignored the study because it didn’t endorse the design the Bush administration wanted.¶ The IFR has been sitting on the shelf for 15 years and the DOE currently has no plans to change that.¶ How does the US expect to be a leader in clean energy by ignoring our best nuclear technology? Nobody I’ve talked to has been able to answer that question.¶ We have the technology (it was running for 30 years before we were ordered to tear it down). And we have the money: The Recovery Act has $80 billion dollars. Why aren’t we building a demo plant?¶ IFRs are better than conventional nuclear in every dimension. Here are a few:¶ Efficiency: IFRs are over 100 times more efficient than conventional nuclear. It extracts nearly 100% of the energy from nuclear material. Today’s nuclear reactors extract less than 1%. So you need only 1 ton of actinides each year to feed an IFR (we can use existing nuclear waste for this), whereas you need 100 tons of freshly mined uranium each year to extract enough material to feed a conventional nuclear plant.¶ Unlimited power forever: IFRs can use virtually any actinide for fuel. Fast reactors with reprocessing are so efficient that even if we restrict ourselves to just our existing uranium resources, we can power the entire planet forever (the Sun will consume the Earth before we run out of material to fuel fast reactors). If we limited ourselves to using just our DU “waste” currently in storage, then using the IFR we can power the US for over 1,500 years without doing any new mining of uranium.[5]¶ Exploits our largest energy resource: In the US, there is 10 times as much energy in the depleted uranium (DU) that is just sitting there as there is coal in the ground. This DU waste is our largest natural energy resource…but only if we have fast reactors. Otherwise, it is just waste. With fast reactors, virtually all our nuclear waste (from nuclear power plants, leftover from enrichment, and from decommissioned nuclear weapons)[6] becomes an energy asset worth about $30 trillion dollars…that’s not a typo…$30 trillion, not billion.[7] An 11 year old child was able to determine this from publicly available information in 2004.

#### Alternative methods can’t solve warming

**Kirsch 9** (Steve Kirsch, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, American serial entrepreneur who has started six companies: Mouse Systems, Frame Technology, Infoseek, Propel, Abaca, and OneID, "How Does Obama Expect to Solve the Climate Crisis Without a Plan?" 7/16/9) [http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html-http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to\_b\_236588.html](http://www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html-http%3A//www.huffingtonpost.com/steve-kirsch/how-does-obama-expect-to_b_236588.html)

The ship is sinking slowly and we are quickly running out of time to develop and implement any such plan if we are to have any hope of saving the planet. What we need is a plan we can all believe in. A plan where our country's smartest people all nod their heads in agreement and say, "Yes, this is a solid, viable plan for keeping CO2 levels from touching 425ppm and averting a global climate catastrophe."¶ ¶ At his Senate testimony a few days ago, noted climate scientist James Hansen made it crystal clear once again that the only way to avert an irreversible climate meltdown and save the planet is to phase out virtually all coal plants worldwide over a 20 year period from 2010 to 2030. Indeed, if we don't virtually eliminate the use of coal worldwide, everything else we do will be as effective as re-arranging deck chairs on the Titanic.¶ ¶ Plans that won't work¶ ¶ Unfortunately, nobody has proposed a realistic and practical plan to eliminate coal use worldwide or anywhere close to that. There is no White House URL with such a plan. No environmental group has a workable plan either.¶ ¶ Hoping that everyone will abandon their coal plants and replace them with a renewable power mix isn't a viable strategy -- we've proven that in the U.S. Heck, even if the Waxman-Markey bill passes Congress (a big "if"), it is so weak that it won't do much at all to eliminate coal plants. So even though we have Democrats controlling all three branches of government, it is almost impossible to get even a weak climate bill passed.¶ ¶ If we can't pass strong climate legislation in the U.S. with all the stars aligned, how can we expect anyone else to do it? So expecting all countries to pass a 100% renewable portfolio standard (which is far far beyond that contemplated in the current energy bill) just isn't possible. Secondly, even if you could mandate it politically in every country, from a practical standpoint, you'd never be able to implement it in time. And there are lots of experts in this country, including Secretary Chu, who say it's impossible without nuclear (a point which I am strongly in agreement with).¶ ¶ Hoping that everyone will spontaneously adopt carbon capture and sequestration (CCS) is also a non-starter solution. First of all, CCS doesn't exist at commercial scale. Secondly, even if we could make it work at scale, and even it could be magically retrofitted on every coal plant (which we don't know how to do), it would require all countries to agree to add about 30% in extra cost for no perceivable benefit. At the recent G8 conference, India and China have made it clear yet again that they aren't going to agree to emission goals.¶ ¶ Saying that we'll invent some magical new technology that will rescue us at the last minute is a bad solution. That's at best a poor contingency plan.¶ ¶ The point is this: It should be apparent to us that we aren't going to be able to solve the climate crisis by either "force" (economic coercion or legislation) or by international agreement. And relying on technologies like CCS that may never work is a really bad idea.¶ ¶ The only remaining way to solve the crisis is to make it economically irresistible for countries to "do the right thing." The best way to do that is to give the world a way to generate electric power that is economically more attractive than coal with the same benefits as coal (compact power plants, 24x7 generation, can be sited almost anywhere, etc). Even better is if the new technology can simply replace the existing burner in a coal plant. That way, they'll want to switch. No coercion is required.

#### IFR’s can be commercialized and solve coal

**Archambeau et al 11** [The Integral Fast Reactor (IFR): An Optimized Source for Global Energy Needs, Charles Archambeau, Science Council for Global Initiatives, Randolph Ware, Cooperative Institute for Research in Environmental Sciences, Tom Blees, National Center for Atmospheric Research, Barry Brook, University of Adelaide, Jerry Peterson, Argonne National Laboratory,¶ Yoon Chang, University of Colorado, February 2011]

The new features of the IFR systems with pyroprocessing are such that the cost of¶ electrical energy production is estimated to be quite low, in the range below $.01 per¶ kilowatt-hour for an IFR. (For comparison, natural gas fuel cost was at $.05 per kilowatthour,¶ and coal was at about $.03 per kilowatt-hour, while LWR nuclear power was at $.02¶ per kilowatt-hour.) The G.E. estimated building cost of the S-Prism reactor (Fletcher,¶ 2006) is $1300/kw, where this cost assumes some cost savings due to mass production and¶ modular construction. For a commercial level gigawatt reactor (using 3 modular S-Prism¶ reactors with 380 MW of power from each) the cost would total $1.3 billion dollars per¶ one gigawatt plant. These nuclear plants are essentially carbon dioxide emissions free, and¶ in general produce no atmospheric pollution. Further, all the Uranium fuel can be provided¶ from processing the stock piles of spent and depleted Uranium fuel. Therefore, no Uranium¶ mining and associated pollution will occur. Likewise, IFR waste material is minimal and¶ short-lived so that no pollution will occur from this source. Consequently, significant¶ reduction in greenhouse gases, and a variety of other dangerous pollutants, can be¶ immediately achieved if these IFR plants are used to replace the furnaces in coal burning¶ power plants which exist in profusion world-wide. Here the infrastructure at existing coal fueled plants, such as electric power lines, water sources and conduits, steam turbines, etc.,¶ can all be simply converted and used in the nuclear powered plant. Hence, costs of¶ building complete power plants and their electrical connections to the grid can be¶ minimized while the impact on global warming and pollution related diseases can be¶ maximized by replacing the worst of the polluters. Further, it is urgent that we move¶ quickly to strongly and immediately control CO2 gas emissions to drastically slow global¶ warming. Clearly, the costs are not prohibitive since construction of one large stand-alone¶ pyroprocessing plant, at about 6 billion dollars, and only about 10 of the large IFR¶ powered plants, costing under 20 billion dollars, will go a long way toward strongly¶ dampening the massive production of CO2 emissions from existing electricity power plants¶ in the U.S.

#### IFRs are commercially viable—the tech works

**Kirsh 11** (Steven T. Kirsh, Bachelor of Science and a Master of Science in electrical engineering and computer science from the Massachusetts Institute of Technology, “Why Obama should meet Till,” 9/28/11)

I will tell you the story of an amazing clean power technology that can use nuclear waste for fuel and emit no long-lived nuclear waste; that can supply clean power at low cost for our planet, 24×7, for millions of years without running out of fuel. I will tell you why this technology is our best bet to reduce the impact of global warming on our planet. And finally, I will tell you why nobody is doing anything about it and why this needs to be corrected.¶ If you act on this letter, you will save our country billions of dollars and allow us to become leaders in clean energy. If you delegate it downward, nothing will happen.¶ I have no vested interest in this; I am writing because I care about the future of our planet¶ First, since we met only briefly during the Obama campaign, let me provide a little background about myself. I am a high-tech entrepreneur and philanthropist based in Silicon Valley. I have received numerous awards for my philanthropy. For example, in 2003, I was honored to receive a National Caring Award presented by then Senator Clinton. The largest engineering auditorium at MIT is named in my honor. The first community college LEED platinum building in the nation is also named in my honor.¶ I am also active in Democratic politics. In the 2000 election, for example, I was the single largest political donor in the United States, donating over $10 million dollars to help Al Gore get elected. Unfortunately, we lost that one by one vote (on the Supreme Court).¶ I have no vested interest in nuclear power or anything else that is described below. I write only as someone who cares about our nation, the environment, and our planet. I am trying to do everything I can so my kids have a habitable world to live in. Nothing more.¶ Dr. James Hansen first made me aware of fast reactors in his letter to Obama in 2009¶ As an environmentalist, I have been a fan of Jim Hansen’s work for nearly two decades. Many consider Dr. Hansen to be the world’s leading expert on global warming. For example, Hansen was the first person to make Congress aware of global warming in his Senate testimony in 1988. Hansen is also Al Gore’s science advisor.¶ In 2009, Dr. Hansen wrote a letter to President Obama urging him to do just three things that are critical to stop global warming: 1) phase out coal plants, 2) impose a feebate on carbon emissions with a 100% rebate to consumers and 3) re-start fourth generation nuclear plants, which can use nuclear waste as fuel. Hansen’s letter to Obama is documented here: http://www.guardian.co.uk/environment/2009/jan/02/obama-climate-change-james-hansen¶ Upon reading Hansen’s recommendations, I was fascinated by the last recommendation. The fourth-generation power plants Hansen advocated sounded too good to be true. If what Hansen was saying was true, then why wasn’t our nation jumping on that technology? It made no sense to me.¶ Lack of knowledge, misinformation, and the complexity of nuclear technology have hampered efforts to get a fast reactor built in the US¶ I spent the next two years finding out the answer to that question. The short answer is three-fold: (1) most people know absolutely nothing about the amazing fourth generation nuclear power plant that we safely ran for 30 years in the US and (2) there is a lot of misleading information being spread by seemingly respectable people (some of whom are in the White House) who never worked on a fourth generation reactor that is totally false. It’s not that they are misleading people deliberately; it’s just that they were either listening to the wrong sources or they are jumping to erroneous conclusions. For example, the most popular misconception is that “reprocessing is a proliferation risk.” That statement fails to distinguish between available reprocessing techniques. It is absolutely true for the French method but it is absolutely not true for the technology described in this letter! The third reason is that the technology is complicated. Most people don’t know the difference between oxide fuel and metal fuel. Most people don’t know what a fast reactor is. Most people can’t tell you the difference between PUREX, UREX, and pyroprocessing. So people with an agenda can happily trot out arguments that support their beliefs and it all sounds perfectly credible. They simply leave out the critical details.¶ We don’t need more R&D. We already have a technology in hand to help us solve global warming and safely get rid of our nuclear waste at low cost. But we aren’t doing anything with it. That’s a serious mistake.¶ Today, our nation faces many serious challenges such as:¶ How can we avert global warming?¶ How can we dispose of our existing nuclear waste safely?¶ How can we generate base-load carbon-free power at very low cost?¶ How can we avoid creating any additional long-lived nuclear waste?¶ How can we grow our economy and create jobs?¶ How can we become the world leader in clean energy?¶ How can we do all of the above while at the same time spending billions less than we are now?¶ The good news is that we already have a proven technology that can address all of these problems. It is a technology that has enjoyed over 30 years of bi-partisan Congressional and Presidential support. It is an advanced nuclear technology that was invented in 1951 by the legendary Walter Zinn and then refined and perfected over a 30 year period, from 1964 to 1994 by Dr. Charles Till who led a team of 1,200 people at the Argonne National Laboratory. Till’s reactor was known as the Integral Fast Reactor (IFR) because it both produced power and recycled its own waste back into the reactor. This is the technology that Hansen referenced in his letter to the President.¶ The IFR is a fourth-generation nuclear design that has several unique and valuable characteristics:¶ It can use our existing nuclear waste (from power plants and weapons) as fuel; we have over 1,000 years of power available by just using today’s nuclear waste. Instead of trying to bury that “waste” in Yucca Mountain, we could be using it for fuel in fast reactors.¶ It generates no long-lived nuclear waste.¶ It is safer than today’s light water reactor (LWR) nuclear power plants. Unlike the Fukushima LWR reactors (a second generation nuclear technology invented 50 years ago), the IFR does NOT require electricity to shut down safely. The IFR shuts down passively if a mishap occurs; no operator intervention or active safety systems are required. They ran the Three Mile Island and Chernobyl scenarios on a live reactor and the reactor shut itself down safely, no operator intervention required, just as predicted. In addition, unlike with LWRs, the IFR runs at low pressure which adds to the safety profile.¶ It reduces the risk of nuclear proliferation because: (1) it eliminates the need for enrichment facilities (which can be used for making nuclear bomb material), (2) the nuclear material that is used in the IFR is not suitable for making bombs and (2) because the nuclear material in the reactor and in the reprocessing hot cell is too “hot” to be stolen or used in a weapon.¶ Experts at General Electric (GE) believe that the IFR has the potential to produce power for less than the price of coal. Dr. Loewen can confirm that if you have any doubts.¶ GE already has an IFR design on the table that they would like to build as soon as possible. Dr. Loewen can confirm that as well.¶ The US Nuclear Regulatory Commission, in January 1994, issued a pre-application safety evaluation report in which they found no objections or impediments to licensing the IFR. You can see the NRC report in the 8 minute video.¶ The design is proven. It produced electric power without mishap for 30 years before the project was abruptly cancelled.¶ Dr Charles Till¶ The IFR’s ability to solve the nuclear waste problem should not be underestimated. As respected nuclear experts have pointed out, a practical solution to the nuclear waste problem is required if we are to revive nuclear power in the United States. The Blue Ribbon Commission (BRC) on America’s Nuclear Future basically concluded this: “continue doing the same thing we are doing today and keep doing R&D.” That was predictable because it was a consensus report; everyone had to agree. So nothing happened. And because there was no consensus from the BRC , there is less money for nuclear because there is no solution to the waste problem. It’s a downward death spiral.¶ Please pardon me for a second and allow me to rant about consensus reports. In my 30 year career as an entrepreneur, I’ve raised tens of millions of millions of dollars in investment capital from venture capitalists all over the world. I always ask them how they make investment decisions. They always tell me, “If we had to get all partners to agree on an investment, we’d never make any investments. If you can get two partners to champion your company, that is sufficient to drive an investment decision.” Therefore, if you want to get nothing done, ask for a consensus report. If you want to actually solve problems, you should listen to what the people most knowledgeable about the problem are saying.¶ Dr Yoon I. Chang¶ Had President Obama asked the Commissioners on the Nuclear Regulatory Commission (NRC) who have the most knowledge of fast reactors the same question that he tasked the BRC with, he would have gotten a completely different answer. They would have told President Obama that fast reactors and pyroprocessing are the way to go and we better get started immediately with something that we already know works because there is still a ten year time if we were to start the reactor building process today. Their advice leads to a viable solution that we know will work and it will make the US a leader in clean nuclear power. Following the BRC’s consensus advice will lead to decades of inaction. Totally predictable.¶ If we put a national focus on developing and cost reducing the IFR, we’d have a killer product and lead the world in being a clean energy leader¶ It would be great if we had a long-term strategy and vision for how we become energy independent and solve the global warming problem and help our economy at the same time. The IFR can play a key role in that vision. If we put a national focus on developing and commercializing the IFR technology we invented, we can create jobs, help our trade balance, mitigate global warming, become energy independent, show the world a safe way to get rid of nuclear waste, and become the leaders in clean power technology.¶ Nuclear power is the elephant in the room. Even though we haven’t built a new nuclear plant in 30 years, nuclear still supplies 70% of the clean energy in America today. That feat was largely accomplished in a single ten year period. Renewables have had 3 decades to “catch up” and they aren’t anywhere close. Nuclear’s continued dominance shows that nuclear power is indeed the elephant in the room when it comes to being able to install clean energy quickly and affordably.¶ The bad news is that President Clinton decided that this technology, which would have produced unlimited amounts of base-load carbon-free power for a price as low as anything else available today, was not needed and cancelled the project in 1994.¶ Cancelling the IFR was a big mistake. It’s still the world’s best fast nuclear technology according to an independent study by the Gen IV International Forum.¶ Many top scientists all over the world believe that President Clinton’s decision was a huge mistake. The Senate had voted to continue to fund it. The project had been supported by six US Presidents; Republicans and Democrats. In fact, the project’s biggest proponent was Republican President Richard Nixon who said in 1971, “Our best hope today for meeting the Nation’s growing demand for economical clean energy lies with the fast breeder reactor.”¶ Republican Senator Kempthorne said of the IFR cancellation:¶ Unfortunately, this program was canceled just 2 short years before the proof of concept. I assure my colleagues someday our Nation will regret and reverse this shortsighted decision. But complete or not, the concept and the work done to prove it remain genius and a great contribution to the world.¶ While I am not a big fan of Senator Kempthorne, I couldn’t agree more with what he said in this particular case.¶ The IFR remains the single best advanced nuclear power design ever invented. That fact was made clear when in 2002, over 240 leading nuclear scientists from all over the world (in a Gen IV International Forum sponsored study) independently evaluated all fourth-generation nuclear designs and ranked the IFR the #1 best overall advanced nuclear design.¶ The IFR was cancelled in 1994 without so much as a phone call to anyone who worked on the project. They didn’t call then. They haven’t called since. They simply pulled the plug and told people not to talk about the technology.¶ The US government invested over $5 billion dollars in the IFR. Fast reactor R&D is largest single technology investment DOE has ever made. According to a top DOE nuclear official (Ray Hunter, the former NE2 at DOE), the “IFR became the preferred path because of waste management, safety, and economics.” The reactor produced power for 30 years without incident. Despite that track record, before it was cancelled, nobody from the White House ever met with anyone who worked on the project to discuss whether it should be terminated or not. It was simply unilaterally terminated by the White House for political reasons. Technical experts were never consulted. To this day, no one from the White House has met with Dr. Till to understand the benefits of the project. The technical merits simply did not matter.¶ I urge you to recommend to President Obama that he meet personally with Dr. Charles Till so that the President can hear first hand why it is so critical for the health of our nation and our planet that this project, known as the Integral Fast Reactor (IFR), be restarted. Dr. Till headed the project at Argonne National Laboratory until his retirement in 1997. He is, without a doubt, the world’s leading expert on IFR technology.¶ Want to solve global warming? Easy. Just create a 24×7 clean power source that costs the same as coal. Prominent scientists believe that the IFR can achieve this.¶ Dr. Hansen has pointed out many times that it is imperative to eliminate all coal plants worldwide since otherwise, we will never win the battle against global warming. But we know from experience that treaties and agreements do not work. Here’s a quote from an article (“The Most Important Investment that We Aren’t Making to Mitigate the Climate Crisis”) that I wrote in December 2009 published in the Huffington Post:¶ If you want to get emissions reductions, you must make the alternatives for electric power generation cheaper than coal. It’s that simple. If you don’t do that, you lose.¶ The billions we invest in R&D now in building a clean and cheaper alternative to coal power will pay off in spades later. We have a really great option now — the IFR is on the verge of commercial readiness — and potential competitors such as the Liquid Fluoride Thorium Reactor (LFTR) are in the wings. But the US government isn’t investing in developing any of these breakthrough new base-load power generation technologies. Not a single one.¶ I found it really amazing that global leaders were promising billions, even hundreds of billions in Copenhagen for “fighting climate change” when they weren’t investing one cent in the nuclear technologies that can stop coal and replace it with something cheaper.¶ [ Note: 6 days ago, on September 22, 2011, DOE agreed to give $7.5M to MIT to do R&D on a molten-salt reactor. That’s good, but we should be building the technology we already have proven in 30 years of operational experience before we invest in unproven new technologies. ]¶ Dr. Loewen has personally looked at the costs for the building the IFR in detail and believes the IFR can generate power at a cost comparable to a coal plant. So it’s arguably our best shot at displacing coal plants. This is precisely why Dr. Hansen believes that the IFR should be a top priority if we want to save our planet.¶ It isn’t just nuclear experts that support the IFR¶ US Congressman John Garamendi (D-CA) is also a major IFR supporter. When he was Lt. Governor of California, Congressman Garamendi convened a panel of over a dozen our nation’s top scientists to discuss the IFR technology. As a result of that meeting, Garamendi became convinced that the IFR is critically important and he is currently trying very hard to get a bill passed in the House to restart it. Unfortunately, virtually everyone in Congress seems to have forgotten about this project even though in the 1970’s it was the President’s top energy priority. Nothing has changed since then. No other clean energy technology has been invented that is superior to the IFR for generating low-cost carbon-free base-load electric power.¶ Bill Gates also found exactly the same thing when he looked at how to solve the global warming problem. As he explained in a recent TED talk, renewables will never solve the climate crisis. The only viable technology is fourth-generation nuclear power and the best advanced nuclear technology is the IFR. That is why this is Gate’s only clean energy investment. Gates’ TerraPower Travelling Wave Reactor (TWR) is a variant of the IFR design. When Gates approached DOE to try to build his reactor in the US, he was told to build it outside of the US.¶ Nobel prize winner Hans Bethe (now deceased) was an enthusiastic supporter. Freeman Dyson called Bethe the “supreme problem solver of the 20th century. Chuck Till told me the following story of Bethe’s support for the IFR:¶ A tale from the past: A year or two before the events I’ll describe, Hans Bethe had been contacted by the Argonne Lab Director for his recommendation on who to seek to replace the existing head of Argonne’s reactor program.¶ Bethe told him the best choice was already there in the Lab, so it was in this way that I was put in charge. I had had quite a few sessions with him in the years leading up to it, as we were able to do a lot of calculations on the effects of reactor types on resources that he didn’t have the capability at his disposal to do himself.¶ So when I wanted to initiate the IFR thrust, the first outside person I went to was Bethe at Cornell. After a full day of briefing from all the specialists I had taken with me, he suggested a brief private meeting with me. He was direct. He said “All the pieces fit. I am prepared to write a letter stating this. Who do you want me to address it to? I think the President’s Science Advisor, don’t you?” I said the obvious – that his opinion would be given great weight, and would give instant respectability.¶ He went on, “I know him quite well. Who else?” I said I was sure that Senator McClure (who was chairman of Senate Energy and Resources at the time) would be relieved to hear from him. That the Senator would be inclined to support us, as we were fairly prominent in the economy of the state of Idaho, and for that reason I had easy access to him. But to know that Hans Bethe, a man renowned for his common sense in nuclear and all energy matters, supported such an effort would give him the Senator solid and quotable reason for his own support, not dismissible as parochial politics, that the Senator would want if he was to lead the congressional efforts. “Yes,” he said in that way he had, “I agree.”¶ I’ve always thought that the President’s Science Advisor’s intervention with DOE, to give us a start, was not the result of our meeting him, but rather it was because of the gravitas Hans Bethe provided with a one page letter.¶ How do we lead the world in clean energy if we put our most powerful clean energy technology on the shelf?!?¶ President Obama has stated that he wants the US to be a leader in clean energy. I do not see how we achieve that if we allow our most advanced clean energy technology to sit on the shelf collecting dust and we tell one of America’s most respected businessmen that he should build his clean energy technology in another country. We have an opportunity here to export energy technology to China instead of importing it. But due to Clinton’s decision, we are allowing the Russians to sell similar fast reactor technology to the Chinese. It should have been us.¶ Re-starting the IFR will allow us to cancel a $10 billion stupid expenditure. The IFR only costs $3B to build. We’d get more, pay less. On pure economics alone, it’s a no brainer.¶ Finally, even if you find none of the arguments above to be compelling, there is one more reason to restart the IFR project: it will save billions of dollars. Today, we are contracting with the French to build a MOX reprocessing plant in Savannah River. The cost of that project is $10 billion dollars. We are doing it to meet our treaty obligations with the Russians. Former top DOE nuclear managers agree this is a huge waste of money because we can build an IFR which can reprocess 10 times at much weapons waste per year for a fraction of that cost.¶ The Russians are laughing at our stupidity. They are going to be disposing of their weapons waste in fast reactors, just like we should be. The Russians are also exporting their fast reactors to the Chinese. Had the US not cancelled our fast reactor program, we would be the world leader in this technology because our technology remains better than any other fourth generation technology in the world.¶ If you delegate this to someone else, nothing will happen. Here’s why.¶ Delegating this letter downward from the White House to someone in DOE to evaluate will result in inaction and no follow up. I know this from past attempts that have been made. It just gets lost and there is no follow up. Every time. The guys at DOE want to do it, but they know that they will get completely stopped by OMB and OSTP. Both Carol Browner and Steven Chu asked former DOE nuclear management what to do about nuclear waste. They were told that using fast reactors and reprocessing was the way to go. But nothing happened. So Chu has given up trying. According to knowledgeable sources, the White House has told DOE in no uncertain terms, “do not build anything nuclear in the US.” It’s not clear who is making these decisions, but many people believe it is being driven by Steven Fetter in OSTP.¶ Dr. Till knows all of this. He knows that unless he personally meets with the President to tell the story of this amazing technology, nothing will happen.¶ I’ve discussed the IFR with Steve Fetter and he has his facts wrong. Fetter is basically a Frank von Hippel disciple: they have written at least 14 papers together! It was von Hippel who was largely responsible for killing the IFR under Clinton.¶ So von Hippel’s misguided thought process is driving White House policy today. That’s a big mistake. Professor von Hippel twists the facts to support his point of view and fails to bring up compelling counter arguments that he knows are true but would not support his position. He’s not being intellectually honest. I’ve experienced this myself, firsthand. For example, von Hippel often writes that fast reactors are unreliable. When I pointed out to him that there are several examples of reliable fast reactors, including the EBR-II which ran for decades without incident, he said, that these were the “exceptions that prove the rule.” I was floored by that. That’s crazy. It only proves that it is complicated to build a fast reactor, but that it can easily be done very reliably if you know what you are doing. There is nothing inherent to the technology that makes it “unreliable.” You just have to figure out the secrets. When von Hippel heard that Congressman Garamendi was supporting the IFR, he demanded a meeting with Garamendi to “set him straight.” But what happened was just the opposite: Garamendi pointed out to von Hippel that von Hippel’s “facts” were wrong. Von Hippel left that meeting with Garamendi with his tail between his legs muttering something about that being the first time he’s ever spoken with anyone in Congress who knew anything about fast nuclear reactors. In short, if you watch a debate between von Hippel and Garamendi (who is not a scientist), Garamendi easily wins on the facts. If you put von Hippel up against someone who knows the technology like Till, Till would crush von Hippel on both the facts and the arguments. But the Clinton White House never invited Till to debate the arguments with von Hippel. They simply trusted what von Hippel told them. Big mistake.¶ There are lots of problems with von Hippel’s arguments. For example, von Hippel ignores reality believing that if the USA doesn’t do something then it will not happen. That’s incredibly naieve and he’s been proven wrong. The USA invented a safe way to reprocess nuclear waste that isn’t a proliferation risk called pyroprocessing. The nuclear material is not suitable for making a bomb at any time in the process. But we never commercialized it because von Hippel convinced Clinton to cancel it. The French commercialized their reprocessing process (PUREX) which separates out pure plutonium and makes it trivial to make bomb material. So because countries need to reprocess, they pick the unsafe technology because they have no alternative. Similarly, because von Hippel had our fast reactor program cancelled, the Russians are the leaders in fast reactor technology. They’ve been using fast reactor technology for over 30 years to generate power commercially. But we know the Russians have a terrible nuclear safety record (e.g., Chernobyl). The fact is that the Chinese are buying fast reactors from the Russians because there is no US alternative. The problem with von Hippel’s arguments are that the genie is out of the bottle. We can either lead the world in showing how we can do this safely, or the world will choose the less safe alternatives. Today, von Hippel’s decisions have made the world less safe. I could go on and on about how bad von Hippel’s advice is, but this letter is already way too long.¶ MIT was wrong in their report about “The Future of the Nuclear Fuel Cycle”¶ The only other seemingly credible argument against building fast reactors now comes from MIT. The report’s recommendation that we have plenty of time to do R&D appears largely to be driven by one person, co-chair Ernie Moniz.¶ Four world-famous experts on nuclear power and/or climate change and one Congressman challenged Moniz to a debate on the MIT campus on his report. Moniz declined.¶ The report has several major problems. Here are a few of them.¶ The MIT report is inconsistent. On the one hand it says, “To enable an expansion of nuclear power, it must overcome critical challenges in cost, waste disposal, and proliferation concerns while maintaining its currently excellent safety and reliability record.” We agree with that! But then it inexplicably says, “… there are many more viable fuel cycle options and that the optimum choice among them faces great uncertainty…. Greater clarity should emerge over the next few decades… A key message from our work is that we can and should preserve our options for fuel cycle choices by …[continuing doing what we are doing today] … and researching technology alternatives appropriate to a range of nuclear energy futures.” So even though we have a solution now that can be deployed so we can enable an expansion of nuclear power as soon as possible, MIT advises that we should spend a few more decades because we might find something better than the IFR. This is just about the dumbest thing I’ve ever heard coming from MIT. If you ask any scientist who knows anything about global warming, they will tell you we are decades late in deploying carbon-free power. Had we aggressively ramped fast nuclear closed-cycle reactors decades ago and promoted them worldwide, we wouldn’t be anywhere close to the disastrous situation we are in today. So we are decades too late in ramping up nuclear power, and Moniz wants us to spend decades doing more R&D to get a solution that might be lower cost than the IFR. That’s insane.¶ The report looks at the market price of uranium, but the market price completely ignores the environmental impacts of uranium mining. Shouldn’t that be taken into account? It’s like the cost of gas is cheap because the market price doesn’t include the hidden costs: the impact on the environment and on our health.¶ Do you really think that people are going to embrace expansion of uranium mining in the US? The MIT report is silent on that. So then we are back to being dependent on other countries for uranium. Wasn’t the whole point to be energy independent? The IFR provides that now. We wouldn’t have to do any uranium mining ever again. After a thousand years, when we’ve used all our existing nuclear waste as fuel, we can extract the additional fuel we need from seawater, making our seas less radioactive. We can do that for millions of years.¶ The MIT report ignores what other countries are doing. Obama wants the US to be a leader in clean energy technology. You do that by building the most advanced nuclear designs and refining them. That’s the way you learn and improve. MIT would have us stuck on old LWR technology for a few decades. Does anyone seriously think that is the way to be the world leader? There is virtually no room for improvement in LWR technology. IFR technology is nearly 100 times more efficient, and it emits no long term nuclear waste. If you are a buyer of nuclear power in China, which nuclear reactor are you going to pick? The one that is 100 times more efficient and generates no waste? Or the one that is 100 times less efficient and generates waste that you better store for a million years? Wow. Now that’s a real tough question, isn’t it. Gotta ponder that one. I’m sure Apple Computer isn’t taking advice from Moniz. If they were, they’d still be building the Apple I. Ernie should get a clue. The reason Apple is a market leader is because they bring the latest technology to market before anyone else, not because they keep producing old stuff and spend decades doing R&D to see if they can come up with something better. Other countries are not hampered by MIT’s report. France and Japan recently entered into an agreement with the US DOE whereby we’re giving them the IFR technology for them to exploit. Even though we are stupid, they aren’t stupid. The Chinese are ordering inferior oxide fueled fast reactors from Russia. If the US were building metal-fueled fast reactors with pyroprocessing, it’s a good bet the Chinese would be buying from us instead of the Russians. But if we take Moniz’s advice to not build the world’s best advanced nuclear technology we already have, then there is no chance of that happening. By the time we get to market with a fast reactor, it will be all over. We’ll arrive to the market decades late. Another great American invention that we blew it on.¶ There will always be new technologies that people will propose. But the IFR is a bird in the hand and we really need a solution now we can depend on. If something comes along later that is better, that’s great. But if it doesn’t, we will have a viable technology. We can’t afford to get this wrong. We have already run out of time. Any new nuclear designs are decades away from deployment.¶ On September 22, 2011, DOE agreed to give MIT $7.5 millions of dollars on starting R&D on a fourth generation molten salt reactor design that have never been proven. While it might work, the very smart scientists at Oak Ridge National Laboratory spent well over a decade on this and were never able to make it work. So DOE is spending millions on an unproven design while spending nothing on the “sure thing” fourth generation reactor that we already know how to build and that ran flawlessly for 30 years. We are all scratching our heads on that one. It makes no sense. But the reason for this is clear: the mandate from the White House that nothing is to built means that DOE can only initiate research, and then cancel the project right before anything would be built. This is an excellent plan for demoralizing scientists and allowing other countries to lead the world in clean energy. Is that really what we want?? If so, then there are much less expensive ways to accomplish that.¶ At a minimum we should be investing in commercializing our “bird in the hand.” That way, if the new molten salt reactor experiments don’t work out, we’ll still have a viable solution to the nuclear waste problem. If we keep cancelling successful projects right before they are done, hoping for the next big thing, we will forever be in R&D mode and get nothing done. That’s where we are today with fourth generation nuclear.¶ I know this is an unusual request, but I also know that if the President is allowed to evaluate the facts first hand, I am absolutely convinced that he will come to the same conclusion as we all have.¶ I urge you to view an 8 minute video narrated by former CBS Morning News anchor Bill Kurtis that explains all of this in a way that anyone can understand. This video can be found at:¶ The video will amaze you.¶ If you would like an independent assessment of what I wrote above from a neutral , trustworthy, and knowledgeable expert, Bill Magwood would be an excellent choice. Magwood was head of nuclear at DOE under Clinton and Bush, and was the longest serving head of nuclear at DOE in US history. He served under both Clinton and Bush administrations. Magwood is familiar with the IFR, but the IFR was cancelled before he was appointed to head civilian nuclear at DOE. So Magwood has no vested interest in the IFR at all. More recently, Magwood was appointed by President Obama to serve on the NRC and is currently serving in that role. Of the current five NRC Commissioners, Magwood is by far, the person most knowledgeable (PMK) about fast reactors.¶ Thank you for your help in bringing this important matter to the President’s attention.¶ Summary¶ Nuclear power is needed. Renewables alone won’t do it.¶ In order to revive nuclear in the US, you must have a viable solution to the nuclear waste problem.¶ The French reprocess their nuclear waste, but their process is expensive, environmentally unfriendly, and has proliferation problems.¶ The USA developed an inexpensive, environmentally friendly, and proliferation resistant method to reprocess our waste (the IFR), but we cancelled it. That decision was a mistake.¶ We should restart the IFR in the US. It will cost $3B to build, but we can cancel the Areva MOX plant and save $10B to pay for it. So we’ll save money, save the planet from an environmental catastrophe, create jobs, get rid of our nuclear waste, and become the world leader in clean energy technology.¶ President Obama should meet personally with Dr. Charles Till, the world’s leading expert on fast reactor technology. Dr. Till will not waste his time meeting with anyone other than the President because he knows that without personal support of the President, nothing will happen. He’s right.¶ Supporters of this technology include Nobel prize winner Hans Bethe (now deceased), Steven Chu, Dr. James Hansen, Dr. Charles Till, Dr. Eric Loewen, Congressman John Garamendi, Bill Gates, and even the President of MIT. Even the board of directors of the historically anti-nuclear Sierra Club has agreed that they will not oppose building an IFR!¶ Opposition is from OSTP and OMB. We don’t know who or why. It’s a mystery to all my sources. Frank von Hippel thinks you cannot make fast reactors cheaply or reliably and maintains that stance even when the facts show that not to be the case. Ernie Moniz at MIT thinks we shouldn’t build anything now, but do more R&D for the next several decades hoping we can find something better.¶ Bill Magwood, an Obama appointee to the NRC, would be a reasonable choice to provide an objective assessment of the IFR. He has no vested interested in the IFR, but having been the longest serving head of DOE civilian nuclear in history, is familiar with the pros and cons of the technology.¶ Should OSTP and OMB be making these key decisions behind closed doors? Is this really reflective of what the President wants? He’s stated publicly he wants the US to be a world leader in clean energy. Is putting our best technology on the shelf, but licensing the French and Japanese to build it (Joint Statement on Trilateral Cooperation in the area of Sodium-cooled Fast Reactors signed on October 4, 2010 by DOE), the best way for the US to achieve the leadership that Obama said he wanted?¶ I am happy to provide you with additional information.

### Solvency

#### Contention 4: Solvency

#### Plan is modeled internationally

**Blees et al** 11 (Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) [http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/](http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http%3A//bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/)

There are many compelling reasons to pursue the rapid demonstration of a full-scale IFR, as a lead-in to a subsequent global deployment of this technology within a relatively short time frame. Certainly the urgency of climate change can be a potent tool in winning over environmentalists to this idea. Yet political expediency—due to widespread skepticism of anthropogenic causes for climate change—suggests that the arguments for rolling out IFRs can be effectively tailored to their audience. Energy security—especially with favorable economics—is a primary interest of every nation.¶ The impressive safety features of new nuclear power plant designs should encourage a rapid uptick in construction without concern for the spent fuel they will produce, for all of it will quickly be used up once IFRs begin to be deployed. It is certainly manageable until that time. Burying spent fuel in non-retrievable geologic depositories should be avoided, since it represents a valuable clean energy resource that can last for centuries even if used on a grand scale.¶ Many countries are now beginning to pursue fast reactor technology without the cooperation of the United States, laboriously (and expensively) re-learning the lessons of what does and doesn’t work. If this continues, we will see a variety of different fast reactor designs, some of which will be less safe than others. Why are we forcing other nations to reinvent the wheel? Since the USA invested years of effort and billions of dollars to develop what is arguably the world’s safest and most efficient fast reactor system in the IFR, and since several nations have asked us to share this technology with them (Russia, China, South Korea, Japan, India), there is a golden opportunity here to develop a common goal—a standardized design, and a framework for international control of fast reactor technology and the fissile material that fuels them. This opportunity should be a top priority in the coming decade, if we are serious about replacing fossil fuels worldwide with sufficient pace to effectively mitigate climate change and other environmental and geopolitical crises of the 21st century.

#### Government support is vital-~--it overcomes financial barriers to nuclear that the market cannot

Yanosek 12 Kassia, entrepreneur-in-residence at Stanford University’s Steyer-Taylor Center for Energy Policy and Finance and a private equity investor in the energy sector as a principal at Quadrant Management and Founder of Tana Energy Capital LLC, " Financing Nuclear Power in the US", Spring, energyclub.stanford.edu/index.php/Journal/Financing\_Nuclear\_Power\_by\_Kassia\_Yanosek

Over the course of the last decade, it appeared that concerns about carbon emissions, aging coal fleets, and a desire for a diversified generation base were reviving the U.S. utility sector interest in building new nuclear plants. Government and companies worked closely on design certification for Generation III reactors, helping to streamline the licensing process. New loan guarantees from the federal government targeted for nuclear projects were created as part of the 2005 Energy Policy Act. Consequently, dozens of projects entered the planning stages. Following more than 30 years in which no new units were built, it looked as if the U.S. nuclear industry was making significant headway. However, it is yet to be seen how many new nuclear projects will actually make it beyond blueprints due to one of the largest barriers to new nuclear construction: financing risk. Large upfront capital costs, a complex regulatory process, uncertain construction timelines, and technology challenges result in a risk/return profile for nuclear projects that is unattractive for the capital markets without supplementary government or ratepayer support. To many investors, nuclear seems too capital-intensive. Nuclear energy has attractive qualities in comparison to other sources of electricity. A primary motivation to pursue the development of nuclear energy in the U.S. has been its low operating fuel costs compared with coal, oil, and gas-fired plants. Over the lifetime of a generating station, fuel makes up 78% of the total costs of a coal-fired plant. For a combined cycle gas-fired plant, the figure is 89%. According to the Nuclear Energy Institute, the costs for nuclear are approximately 14%, and include processing, enrichment, and fuel management/disposal costs. Today’s low natural gas prices have enhanced the prospects of gas-fired power, but utilities still remain cautious about over-investing in new natural gas generation given the historical volatility of prices. Furthermore, nuclear reactors provide baseload power at scale, which means that these plants produce continuous, reliable power to consistently meet demand. In contrast, renewable energies such as wind or solar are only available when the wind blows or the sun shines, and without storage, these are not suitable for large-scale use. Finally, nuclear energy produces no carbon emissions, which is an attractive attribute for utilities that foresee a carbon tax being imposed in the near future. Given nuclear’s benefits, one may wonder why no new nuclear units have been ordered since the 1970s. This hiatus is in great part due to nuclear’s high cost comparative to other alternatives, and its unique set of risks. As a result, financing nuclear has necessitated government involvement, as the cost of nuclear typically exceeds that of the cost of conventional generation technologies such as coal and natural gas fired generation on a levelized cost of energy (LCOE) basis. LCOE represents the present value of the total cost of building and operating a generating plant over its financial life, converted to equal annual payments and amortized over expected annual generation, and is used to compare across different power generation technologies. For both regulated utilities and independent power producers, nuclear is unattractive if the levelized cost exceeds that of other technologies, since state utility commissions direct regulated utilities to build new capacity using the technology with the lowest LCOE. Furthermore, capital costs are inherently high, ranging in the billions or tens of billions of dollars, and are compounded by financing charges during long construction times. Without government support, financing nuclear is currently notpossible in the capital markets. Recently, Constellation Energy and NRG separately pulled the plug on new multi-billion dollar plants, citing financing problems. Projects, however, will get done on a one-off basis. Southern Company’s Vogtle Plant in Eastern Georgia is likely to be the sponsor of the first new generation to be constructed, taking advantage of local regulatory and federal support. Two new reactors of next-generation technology are in the permitting stage, which will bring online 2,200 megawatts (MW) of new capacity, and will cost $14 billion. The project will take advantage of tax credits and loan guarantees provided in the 2005 Energy Policy Act.

#### And, loan guarantees solve nuclear expansion – shows investors the government has skin in the game, and incentivizes quick agency approval

Adams 10—Publisher of Atomic insights Was in the Navy for 33 years Spent time at the Naval Academy Has experience designing and running small nuclear plants (Rod, Concrete Action to Follow Strongly Supportive Words On Building New Nuclear Power Plants, atomicinsights.com/2010/01/concrete-action-to-follow-strongly-supportive-words-on-building-new-nuclear-power-plants.html)

Loan guarantees are important to the nuclear industry because the currently available models are large, capital intensive projects that need a stable regulatory and financial environment. The projects can be financed because they will produce a regular stream of income that can service the debt and still provide a profit, but that is only true if the banks are assured that the government will not step in at an inopportune time to halt progress and slow down the revenue generation part of the project. Bankers do not forget history or losses very easily; they want to make sure that government decisions like those that halted Shoreham, Barnwell’s recycling facility or the Clinch River Breeder Reactor program are not going to be repeated this time around. For the multi-billion dollar projects being proposed, bankers demand the reassurance that comes when the government is officially supportive and has some “skin in the game” that makes frivolous bureaucratic decisions to erect barriers very expensive for the agency that makes that decision. I have reviewed the conditions established for the guarantee programs pretty carefully – at one time, my company ([Adams Atomic Engines, Inc.](http://www.atomicengines.com)) was considering filing an application. The loan conditions are strict and do a good job of protecting government interests. They were not appropriate for a tiny company, but I can see where a large company would have less trouble complying with the rules and conditions. The conditions do allow low or no cost intervention in the case of negligence or safety issues, but they put the government on the hook for delays that come from bad bureaucratic decision making.

#### Loan guarantees solve – conservative arguments about cronyism and risk underestimation ignore 20 years of loan guarantee data to the contrary

**Griffith and Caperton, 12** - John Griffith is a Policy Analyst with the Economic Policy team at the Center for American Progress. Richard Caperton is the Director of Clean Energy Investment at the Center (Major Analysis: Federal Loans And Loan Guarantees Have A Huge Benefit But A Low And Predicatable Cost, 5/3, <http://thinkprogress.org/climate/2012/05/03/475978/major-analysis-federal-loans-and-loan-guarantees-have-a-huge-benefit-but-a-low-and-predicatable-cost/>)

These programs typically run at very low cost to taxpayers. On average, every $1 allocated to loan and guarantee programs generates more than $99 of economic activity from individuals, businesses, nonprofits, and state and local governments, according to our analysis.¶ But in the wake of certain widely publicized credit blunders, most notably this past summer’s bankruptcy announcement from solar company Solyndra LLC, some have called into question Washington’s ability to manage financial risk. Conservative critics contend that the government is incapable of accurately pricing risk, and that political pressure encourages government agencies to routinely underestimate the risk to taxpayers when extending credit.¶ Government underpricing of risk is a convenient theory for free-market ideologues but it runs contrary to the overwhelming evidence.¶ Our review of federal government credit programs back to 1992 shows that on average the government is quite accurate in its risk pricing. In fact, the majority of government credit programs cost less than originally estimated, not more. Specifically, we found that:¶ Based on initial estimates over the past 20 years, the government expected its credit programs to cost taxpayers 79 cents for every $100 loaned or guaranteed. Based on recently updated data, those cost predictions were reasonably accurate but slightly underestimated. The current budgetary impact of these programs is about 94 cents per $100 loaned or guaranteed.¶ There’s little evidence that credit programs are biased toward underpricing risk. In fact, a little more than half of all nonemergency federal credit programs will cost the government less than what they are expected to over the life of the program.¶ The remainder is accounted for by the losses suffered by the Federal Housing Administration on loans made in 2008 during the peak of the housing crisis. Excluding that book of loans, all nonemergency federal credit programs cost slightly less than expected.¶ Conservative critics often portray a world in which government bureaucrats haphazardly issue loans and loan guarantees without considering taxpayer exposure to risk. That’s simply not the case. This issue brief explains how the government prices credit risk in the federal budget, how well those cost estimates have reflected reality over the years, and why the government is in a particularly good position to assume certain types of risk.¶ Budgeting for credit risk¶ Federal government agencies adhere to strict budget and accounting standards to carefully assess the risks and potential losses associated with credit programs. Here’s how it works.¶ Before an agency can issue any loans or loan guarantees, Congress must first authorize and allocate funding for the program. In most cases Congress starts by determining how much money the program will be authorized to guarantee or loan and then appropriates a certain percentage of that amount to cover the program’s expected cost to the government. That cost estimate—assessed by both the agency administering the program and the president’s Office of Management and Budget—takes into account expected repayments, defaults, recoveries, and any interest or fees collected over the life of the loan, adjusted to current dollars.¶ The net cost to the federal government as a percentage of total dollars loaned or guaranteed is known as the subsidy rate. As an example, say Congress approves a $100 million loan guarantee program within the Department of Agriculture. The department models expected market conditions and loan activity and then estimates a subsidy rate, which the Office of Management and Budget independently estimates as a check on the agency’s methodology. Let’s say the estimated subsidy rate is 0.75 percent. That means the government expects to take a net loss of 75 cents for every $100 it guarantees over the life of those loans. To cover expected losses on the $100 million in loan guarantees, the government sets aside $750,000 in a special account at the Treasury Department. This is similar to a loan loss reserve at a private bank.¶ Each subsequent year, the Office of Management and Budget and the agencies recalculate the subsidy rate to reflect actual loan performance, current economic conditions, and anything else administrators may have learned about a program. These revised numbers are reported in the president’s budget each year, which gives us a pretty good idea of each program’s “actual” costs and the government’s ability to assess financial risk.¶ If conservative claims were accurate in saying that the federal government cannot accurately price for risk, then one would expect the initial cost estimates to be significantly lower than the more recent re-estimates. Using the Department of Agriculture example above, if the critics were right, the re-estimated subsidy rate would presumably be much higher than 0.75 percent, and actual outlays would be higher than estimated. Let’s see how the government’s risk estimates actually stack up.¶ Government risk estimates are quite accurate¶ To test this theory, we analyzed credit data published in the president’s 2013 budget. We compared initial and updated cost estimates, also known as subsidy re-estimates, for each book of nonemergency loans and loan guarantees for each federal credit program since 1992, the first year for which comprehensive data are available.¶ We limit our analysis to nonemergency credit programs, omitting programs created in response to the recent financial crisis. This includes programs created through the Troubled Asset Relief Program—the so-called Wall Street rescue package passed by Congress at the height of the housing and financial crises—and the U.S. Department of the Treasury’s purchase of securities issued by the two troubled housing finance giants Fannie Mae and Freddie Mac. Both of these programs are temporary, atypically large, and are accounted for in the federal budget using different standards than all other credit programs.¶ If we had included these “emergency” programs, it would drastically skew the overall results—but skew them in favor of our basic argument. Based on our analysis of data published in the 2013 budget, these programs will cost the government about $130 billion less than initially expected. So their inclusion would make it seem as though the government significantly overestimated the cost of all credit programs over the past 20 years, which is not the case.¶ We also exclude any federal credit program that is not listed in the federal credit supplement of president’s budget, and any program that did not publish a subsidy re-estimate in the 2013 budget. We do this both because complete data are unavailable for these programs and because their costs are not recorded in the federal budget. Notably, this includes insurance programs through the Federal Deposit Insurance Corporation, mortgage guarantees offered by the two housing finance giants Fannie Mae and Freddie Mac (both now under government conservatorship), and guarantees on mortgage-backed securities offered by the government corporation Ginnie Mae.¶ Here’s what we found out about nonemergency federal credit programs. Federal agencies have issued $5.7 trillion worth of these loans or loan guarantees since 1992. Based on our analysis of initial estimates, the government expected these programs to cost taxpayers about 79 cents for every $100 loaned or guaranteed, or a 0.79 percent subsidy rate overall.¶ Of course, no one expects those estimates to be perfect. Many of these loans such as home mortgages or funding for large infrastructure projects take decades to pay back. Government financial analysts are charged with the difficult task of modeling payments, defaults, recoveries, and market conditions for the entire life of the loan, so some error has to be expected.¶ But as it turns out, the initial estimates weren’t very far off. The current budgetary impact of these credit programs is about 94 cents per $100 loaned or guaranteed, or a 0.94 percent subsidy rate, according to our analysis of updated subsidy estimates. To put that in a budgetary context, while issuing nearly $6 trillion in loans and guarantees over the past 20 years, the government initially predicted about $45 billion in total costs to taxpayers, but the actual costs were slightly higher—about $53 billion.¶ That difference—$8 billion over two decades or $400 million per year—might seem high at first. But it amounts to just 0.15 percent of the total dollars loaned or guaranteed by the government and 0.02 percent of all government spending over that period.(see Figure 1)¶ Of course, the federal government’s performance on individual programs varied substantially. Some programs overestimate risks, while others underestimate. But as mentioned above, some conservatives argue that political pressures cause the government to systemically underprice costs to taxpayers when issuing loans or guarantees.¶ The data show this to be untrue. Of the 104 nonemergency credit programs administered since 1992, our analysis shows that most have actually overestimated total subsidy costs. Fifty-six programs overpriced risk over their lifetimes, while 48 programs underpriced risk. (see Figure 2)¶ Our analysis only takes into account lifetime costs for each program, not the federal government’s ability to estimate costs on an individual year’s portfolio of loans. Indeed, critics often point to individual data points such as the Solyndra bankruptcy as evidence of the government’s inability to price financial risk. But what matters most is actually the net budgetary impact over time of these inaccuracies, which is what is measured in Figure 1.¶ Overall these overestimates and underestimates—whether across programs or in individual books of business—tend to roughly balance out in the long run, give or take a reasonable margin of error. As we show in the following section, however, all of these underestimated losses can actually be attributed to a single year of mortgage guarantees made at the height of the housing crisis.

## 2ac

### AT: Psych

#### Zero empirical or logical basis for the psychoanalytic critique

Mootz, 2k [Francis J, Visiting Professor of Law, Pennsylvania State University, Dickinson School of Law; Professor of Law, Western New England College School of Law, Yale Journal of the Law & Humanities, 12 Yale J.L. & Human. 299, p. 319-320]

Freudian psychoanalysis increasingly is the target of blistering criticism from a wide variety of commentators. 54 In a recent review, Frederick Crews reports that   independent studies have begun to converge toward a verdict... that there is literally nothing to be said, scientifically or therapeutically, to the advantage of the entire Freudian system or any of its component dogmas Analysis as a whole remains powerless... and understandably so, because a thoroughgoing epistemological critique, based on commonly acknowledged standards of evidence and logic decertifies every distinctively psychoanalytic proposition. 55   The most telling criticism of Freud's psychoanalytic theory is that it has proven no more effective in producing therapeutic benefits than have other forms of psychotherapy. 56 Critics draw the obvious conclusion that the benefits (if any) of psychotherapy are neither explained nor facilitated by psychoanalytic theories. Although Freudian psychoanalytic theory purports to provide a truthful account of the operations of the psyche and the causes for mental disturbances, critics argue that psychoanalytic theory may prove in the end to be nothing more than fancy verbiage that tends to obscure whatever healing effects psychotherapeutic dialogue may have. 57

Freudian psychoanalysis failed because it could not make good on its claim to be a rigorous and empirical science. Although Freud's mystique is premised on a widespread belief that psychoanalysis was a profound innovation made possible by his genius, Freud claimed only that he was extending the scientific research of his day within the organizing context of a biological model of the human mind. 58  [\*320]  Freud's adherents created the embarrassing cult of personality and the myth of a self-validating psychoanalytic method only after Freud's empirical claims could not withstand critical scrutiny in accordance with the scientific methodology demanded by his metapsychology. 59 The record is clear that Freud believed that psychoanalysis would take its place among the sciences and that his clinical work provided empirical confirmation of his theories. This belief now appears to be completely unfounded and indefensible.

Freud's quest for a scientifically grounded psychotherapy was not amateurish or naive. Although Freud viewed his "metapsychology as a set of directives for constructing a scientific psychology," n60 Patricia Kitcher makes a persuasive case that he was not a blind dogmatist who refused to adjust his metapsychology in the face of contradictory evidence. n61 Freud's commitment to the scientific method, coupled with his creative vision, led him to construct a comprehensive and integrative metapsychology that drew from a number of scientific disciplines in an impressive and persuasive manner. n62 However, the natural and social sciences upon which he built his derivative and interdisciplinary approach developed too rapidly and unpredictably for him to respond. n63 As developments in biology quickly undermined Freud's theory, he "began to look to linguistics and especially to anthropology as more hopeful sources of support," n64 but this strategy later in his career proved equally [\*321] unsuccessful. n65 The scientific justification claimed by Freud literally eroded when the knowledge base underlying his theory collapsed, leaving his disciples with the impossible task of defending a theory whose presuppositions no longer were plausible according to their own criteria of validation. n66

#### You should reject their Lacanian theory—it’s hackery cloaked in deliberately obscure language.

**Dawkins 2007** – Simonyi Professor for the Public Understanding of Science in the University of Oxford, fellow at the Royal Society of Literature, he has an asteroid officially named after him (4/1, Richard, Nature 394 pp. 141-3, review of Intellectual Impostures by Sokal and Bricmont, “Postmodernism Disrobed”, http://richarddawkins.net/article,824,Postmodernism-Disrobed,Richard-Dawkins-Nature, WEA)

But it's tough on the reader. No doubt there exist thoughts so profound that most of us will not understand the language in which they are expressed. And no doubt there is also language designed to be unintelligible in order to conceal an absence of honest thought. But how are we to tell the difference? What if it really takes an expert eye to detect whether the emperor has clothes? In particular, how shall we know whether the modish French 'philosophy', whose disciples and exponents have all but taken over large sections of American academic life, is genuinely profound or the vacuous rhetoric of mountebanks and charlatans?

Sokal and Bricmont are professors of physics at, respectively New York University and the University of Louvain. They have limited their critique to those books that have ventured to invoke concepts from physics and mathematics. Here they know what they are talking about, and their verdict is unequivocal: on Lacan, for example, whose name is revered by many in humanities departments throughout American and British universities, no doubt partly because he simulates a profound understanding of mathematics:

 . . . although Lacan uses quite a few key words from the mathematical theory of compactness, he mixes them up arbitrarily and without the slightest regard for their meaning. His 'definition' of compactness is not just false: it is gibberish.

They go on to quote the following remarkable piece of reasoning by Lacan:

Thus, by calculating that signification according to the algebraic method used here, namely:

 S (signifier) = s (the statement),

 s (signified)

 With S = (-1), produces: s = sqrt(-1)

You don't have to be a mathematician to see that this is ridiculous. It recalls the Aldous Huxley character who proved the existence of God by dividing zero into a number, thereby deriving the infinite. In a further piece of reasoning which is entirely typical of the genre, Lacan goes on to conclude that the erectile organ

 . . . is equivalent to the sqrt(-1) of the signification produced above, of the jouissance that it restores by the coefficient of its statement to the function of lack of signifier (-1).

We do not need the mathematical expertise of Sokal and Bricmont to assure us that the author of this stuff is a fake. Perhaps he is genuine when he speaks of non-scientific subjects? But a philosopher who is caught equating the erectile organ to the square root of minus one has, for my money, blown his credentials when it comes to things that I don't know anything about.

### Environmental Security 2AC

#### Environmental security challenges state legitimacy and lead to a paradigm shift away from militarism

BARNETT, RESEARCH COUNCIL FELLOW IN THE SCHOOL OF SOCIAL AND ENVIRONMENTAL ENQUIRY AT THE UNIVERSITY OF MELBOURNE, 2001 [JON, THE MEANING OF ENVIRONMENTAL SECURITY: ECOLOGICAL POLITICS AND POLICY IN THE NEW SECURITY ERA, CHAPTER 9, 137-41]

The question of whether it is valid to understand environmental problems as security problems recurs throughout any thoughtful discussion of environmental security. The dilemma should by now be apparent; securitising environmental issues runs the risk that the strategic/realist approach will coopt and colonise the, environmental agenda rather than respond positively to environmental problems (as discussed in Chapter 6). For this reason critics of environmental security, such as Deudney (1991) and-Brock (1991), Suggest that it is dangerous to understand environmental problems as security issues: This book's position on the matter has been emerging in previous chapters. It contends that the problem turns not on the presentation of environmental problems as security issues, but on-the meaning and practice of security in present times. Environmental security, wittingly or not, contests the legitimacy of the realist conception of security by pointing to the contradictions of security as the defence of territory and resistance to change. It seeks to work from within the prevailing conception of security, but to be successful it must do so with a strong sense of purpose and a solid theoretical base. Understanding environmental problems as security problems is thus a form of conceptual speculation. It is one manifestation of the pressure the Green movement has exerted on states since the late 1960s. **This** pressure has pushed state legitimacy nearer to collaps**e,** for if the state cannot control a problem as elemental as environmental degradation, then what is its purpose? This legitimacy problem suggests that environmental degradation cannot further intensify without fundamental change or the collapse of the state. This in turn implies that state-sanctioned environmentally degrading practices such as those undertaken in the name of national security cannot extend their power further if it means further exacerbation of environmental insecurity. While the system may resist environmental security's challenge for change, it must also resist changes for the worse. In terms of the conceptual venture, therefore, appropriation by the security apparatus of the concept of environmental security is unlikely to result in an increase in environmental insecurity (although the concept itself may continue to be corrupted). On the other hand, succeeding in the conceptual venture may mean a positive modification of the theory and practice of national security. It may also mean that national governments will take environmental problems more seriously, reduce defence budgets, and generally implement policies for a more peaceful and environmentally secure world. This dual goal of demilitarisation and upgrading policy may well be a case of wanting to have one's cake and eat it — but either the having or the eating is sufficient justification for the concept (Brock 1996). The worst outcome would be if the state ceased to use the concept of environmental security, heralding the end of the contest and requiring that the interests of peace and the environment be advocated through alternative discourses**.** This is perhaps the only real failure that is likely to ensue from the project of environmental security.

#### Environmental management is inevitable – concrete action key

Levy 99- PhD @ Centre for Critical Theory at Monash

Neil, “Discourses of the Environment,” ed: Eric Darier, p. 215

If the ‘technological fix’ is unlikely to be more successful than strategies of limitation of our use of resources, we are, nevertheless unable simply to leave the environment as it is. There is a real and pressing need for space, and more accurate, technical and scientific information about the non-human world. For we are faced with a situation in which the processes we have already set in train will continue to impact upon that world, and therefore us for centuries. It is therefore necessary, not only to stop cutting down the rain forests, but to develop real, concrete proposals for action, to reverse or at least limit the effects of our previous interventions. Moreover, there is another reason why our behavior towards the non-human cannot simply be a matter of leaving it as it is, at least in so far as our goals are not only environmental but also involve social justice. For if we simply preserve what remains to us of wilderness, of the countryside and of park land, we also preserve patterns of very unequal access to their resources and their consolations (Soper 1995: 207).in fact, we risk exacerbating these inequalities. It is not us, but the poor of Brazil, who will bear the brunt of the misery which would result from a strictly enforced policy of leaving the Amazonian rain forest untouched, in the absence of alternative means of providing for their livelihood. It is the development of policies to provide such ecologically sustainable alternatives which we require, as well as the development of technical means for replacing our current greenhouse gas-emitting sources of energy. Such policies and proposals for concrete action must be formulated by ecologists, environmentalists, people with expertise concerning the functioning of ecosystems and the impact which our actions have upon them. Such proposals are, therefore, very much the province of Foucault’s specific intellectual, the one who works ‘within specific sectors, at the precise points where their own conditions of life or work situate them’ (Foucault 1980g: 126). For who could be more fittingly described as ‘the strategists of life and death’ than these environmentalists? After the end of the Cold War, it is in this sphere, more than any other, that man’s ‘politics places his existence as a living being in question’ (Foucault 1976: 143). For it is in facing the consequences of our intervention in the non-human world that the hate of our species, and of those with whom we share this planet, will be decided?

### AT: Apoc Reps Bad

#### Studies prove – apocalypticism motivates more activism than apathy

**Veldman 12** – Ph.D. candidate in religion at the University of Florida

(Robin Globus, “Narrating the Environmental Apocalypse: How Imagining the End Facilitates Moral Reasoning Among Environmental Activists”, Ethics & the Environment, Volume 17, Number 1, Spring 2012, pp. 1-23, dml)

As we saw in the introduction, critics often argue that apocalyptic rhetoric induces feelings of hopelessness or fatalism. While it certainly does for some people, in this section I will present evidence that apocalypticism also often goes hand in hand with activism. Some of the strongest evidence of a connection between environmental apocalypticism and activism comes from a national survey that examined whether Americans perceived climate change to be dangerous. As part of his analysis, Anthony Leiserowitz identified several “interpretive communities,” which had consistent demographic characteristics but varied in their levels of risk perception. The group who perceived the risk to be the greatest, which he labeled “alarmists,” described climate change using apocalyptic language, such as “Bad…bad…bad…like after nuclear war…no vegetation,” “Heat waves, it’s gonna kill the world,” and “Death of the planet” (2005, 1440). Given such language, this would seem to be a reasonable way to operationalize environmental apocalypticism. If such apocalypticism encouraged fatalism, we would expect alarmists to be less likely to have engaged in environmental behavior compared to groups with moderate or low levels of concern. To the contrary, however, Leiserowitz found that alarmists “were significantly more likely to have taken personal action to reduce greenhouse gas emissions” (ibid.) than respondents who perceived climate change to pose less of a threat. Interestingly, while one might expect such radical views to appeal only to a tiny minority, Leiserowitz found that a respectable eleven percent of Americans fell into this group (ibid). Further supporting Leiserowitz’s findings, in a separate national survey conducted in 2008, Maibach, Roser-Renouf, and Leiserowitz found that a group they labeled “the Alarmed” (again, due to their high levels of concern about climate change) “are the segment most engaged in the issue of global warming. They are very convinced it is happening, humancaused, and a serious and urgent threat. The Alarmed are already making changes in their own lives and support an aggressive national response” (2009, 3, emphasis added). This group was far more likely than people with lower levels of concern over climate change to have engaged in consumer activism (by rewarding companies that support action to reduce global warming with their business, for example) or to have contacted elected officials to express their concern. Additionally, the authors found that “[w]hen asked which reason for action was most important to them personally, the Alarmed were most likely to select preventing the destruction of most life on the planet (31%)” (2009, 31)—a finding suggesting that for many in this group it is specifically the desire to avert catastrophe, rather than some other motivation, that encourages pro-environmental behavior. Taken together, these and other studies (cf. Semenza et al. 2008 and DerKarabetia, Stephenson, and Poggi 1996) provide important evidence that many of those who think environmental problems pose a severe threat practice some form of activism, rather than giving way to fatalistic resignation.

#### Environmental reps good

Kurasawa 4– Prof Sociology, York (Fuyuki, Cautionary Tales, Constellations 11.4, AG)

And yet dystopianism need not imply despondency, paralysis, or fear. Quite the opposite, in fact, since the pervasiveness of a dystopian imaginary can help notions of historical contingency and fallibilism gain traction against their determinist and absolutist counterparts. Once we recognize that the future is uncertain and that any course of action produces both unintended and unexpected consequences, the responsibility to face up to potential disasters and intervene before they strike becomes compelling. From another angle, dystopianism lies at the core of politics in a global civil society where groups mobilize their own nightmare scenarios (‘Frankenfoods’ and a lifeless planet for environmentalists, totalitarian patriarchy of the sort depicted in Atwood’s Handmaid’s Tale for Western feminism, McWorld and a global neoliberal oligarchy for the alternative globalization movement, etc.). Such scenarios can act as catalysts for public debate and socio-political action, spurring citizens’ involvement in the work of preventive foresight.

#### They’re wrong—its key to effective movements

Dabelko 97 – director, Environmental Change and Security Project (Geoffrey, Environment and Security, SAIS Review 17.1, http://muse.jhu.edu/journals/sais\_review/v017/17.1dabelko.html)

Undoubtedly, environment and security research, rhetoric, and activities--and the sobering statistics and trenchant analyses of environment and population dynamics that accompany them--have significantly raised the profile of many environmental concerns. They have also generated many useful discussions and new ways of thinking among a diverse set of experts, including those who previously considered the environment peripheral or unimportant to their interests. At the same time, there are serious limitations to the environment and security conceptual and linguistic framework. As convincing as certain security-related arguments may be, they are not the only reasons why the American public, decisionmakers, and other nations should care about the environment. Value-oriented considerations about the aesthetics of nature, human responsibility for global stewardship, and humanitarian concerns are also important. These considerations [End Page 141] can greatly enhance the process of **formulating effective solutions and winning sustained public attention** **and support for** international **environmental action**. Policymakers might therefore be best served by framing international environmental priorities in terms of a broad set of interests, including, but not limited to, security concerns. They should resist the temptation, common in security analyses, to examine environmental problems solely in terms of crises and "threats." Though helpful in setting priorities, threat-based analyses can have the unintentional effect of encouraging decisionmakers to pay attention to issues only when crises are imminent, by which time it is often too late for effective interventions and corrective measures. Examining how environmental preservation will enhance security and other interests over time might lead decisionmakers to adopt more appropriate long-term strategies to address the underlying causes of problems. International environmental issues will be most effectively addressed in the decades to come through a combination of conceptual clarity, a pragmatic and multidisciplinary approach to problem solving, an emphasis on long-term strategies, and an improved willingness and ability among leaders to explain the complexity of environmental change. As the debates on environment and security continue, environmentalists' arguments will be strengthened if they resist the temptation to place all their priorities under the attention-grabbing security rubric. Meanwhile, skeptical foreign policy experts will benefit from recognizing the real and potential effects of environmental change and their relevance to many critical interests. As the United States considers security expenditures and priorities for the twenty-first century, the vibrant debates concerning environment and security matters will continue to be instructive.

### AT: Biopower Impact

#### No impact

**Dean 4** – Prof Sociology, Macquarie U (Mitchell, Four Theses on the Powers of Life and Death, http://www.usyd.edu.au/contretemps/5december2004/dean.pdf, AG)

In a passage from the latter, Foucault shows that the genocidal character of National Socialism did not simply arise from its extension of bio-power (1979, 149-50). Nazism was concerned with the total administration of the life, of the family, of marriage, procreation, education and with the intensification of disciplinary micro-powers. But it articulated this with another set of features concerned with ‘the oneiric exaltation of a superior blood’, of fatherland, and of the triumph of the race. In other words, if we are to understand how the most dramatic forces of life and death were unleashed in the twentieth century, we have to understand how bio-power was articulated with elements of sovereignty and its symbolics. Pace Bauman, it is not simply the development of instrumental rationality in the form of modern bio-power, or a bureaucratic power applied to life that makes the Holocaust possible. It is the system of linkages, re-codings and re-inscriptions of sovereign notions of fatherland, territory, and blood within the new bio-political discourses of eugenics and racial hygiene that makes the unthinkable thinkable. The fact that all modern states must articulate elements of sovereignty with bio-politics also allows for a virtuous combination. The virtue of liberal and democratic forms of government is that they deploy two instruments to check the unfettered imperatives of bio-power, one drawn from political economy and the other from sovereignty itself (cf. Foucault, 1997a, 73-9). Liberalism seeks to review the imperative to govern too much by pointing to the quasi-natural processes of the market or of the exchanges of commercial society that are external to government. To govern economically means to govern through economic and other social processes external to government and also to govern in an efficient, cost-effective way. Liberalism also invokes the freedom and rights of a new subject - the sovereign individual. By 'governing through freedom' and in relation to freedom, advanced liberal democracies are able to differentiate their bio-politics from that of modern totalitarian states and older police states.

### 2ac at prolif k

#### Prolif impacts outweigh the K and flip ethics

Ford 11 [Chris Ford, Senior Fellow at the Hudson Institute in Washington, D.C. He previously served as U.S. Special Representative for Nuclear Nonproliferation, Principal Deputy Assistant Secretary of State, and General Counsel to the U.S. Senate Select Committee on Intelligence, 1/10/11, Havea and Have-Nots: "Unfairness in nuclear Weapons possession," [www.newparadigmsforum.com/NPFtestsite/?p=658](http://www.newparadigmsforum.com/NPFtestsite/?p=658)]

First, however, let’s provide some context. As I noted above, it is fascinating that in the long history of military technological have/have not dynamics, the international politics of nuclear weaponry has acquired such a strong flavor of moral critique. To my knowledge, after all, one did not see Xiongnu politics emphasizing how darned unfair it was of those nasty Chinese Emperors to monopolize the presumed secrets of China’s bingjia strategic literature. Nor does the unfairness of Byzantine efforts to control the recipe for Greek Fire seem to have become a prevalent trope of Frankish or Persian diplomacy. “Have nots” have surely always coveted powerful tools possessed by the “haves,” or at least wished that the “haves” did not possess them. It seems pretty unusual, however, for non-possessors to articulate such understandable envy and resentment in the moral language of “unfairness,” and to assume that this presumed injustice should motivate the “haves” to change their behavior. This argument seems to be a curiously modern phenomenon.¶ One might respond that the very specialness of nuclear weapons makes such a position appropriate. After all, while a local monopoly on iron swords may have given the Vikings some advantage in skirmishes with Native Americans in what the Norsemen called Vinland, such technological asymmetry was not strategically decisive. (Indeed, the Vikings seem ultimately to have been pushed out of the New World entirely.) If iron had threatened to offer the Vikings an insuperable advantage, would the Skraelings have been justified in developing a moral language of “have/have not” resentment that demanded either the sharing of iron weaponry or Viking disarmament in the name of achieving a global “iron zero”? I’m skeptical, but for the sake of argument let’s say “maybe.”¶ The argument that nuclear weapons are “special,” however, is a two-edged sword. Perhaps they are indeed so peculiarly potent and militarily advantageous that their asymmetric possession is sufficiently “unfair” to compel sharing or disarmament. Such an argument, however, sits only awkwardly – to say the least – with the simultaneous claim by many advocates of the “have/have not” critique that nuclear weapons have no real utility in the modern world and can therefore safely be abandoned by their possessors. After all, it is hard to paint nuclear weapons as being strategically decisive and useless at the same time. (If they are indeed useless, the conclusion of “unfairness” hardly sounds very compelling. If they aren’t useless, however, it may be appropriately hard to abolish them.)¶ More importantly, any argument about the destructively “special” character of nuclear weaponry cuts against the “unfairness critique” in that it is this very specialness that seems to rob the “have/have not” issue of its moral relevance. Unlike iron swords, the bingjia literature, Greek Fire, or essentially all other past military technologies the introduction of which produced global control/acquisition dynamics, nuclear weapons have introduced **existential questions** about the future of human civilization which **utterly swamp** the conventional playground morality of unfair “have/have not” competition**.** No prior technology held the potential to destroy humanity**,** making nuclear weapons – with the possible exception of certain techniques of biological weaponry – a sui generis case to which the conventional “unfairness” critique simply does not very persuasively apply.¶III. Implications¶ Let me be clear about this. The moral critique of nuclear weapons possession may yet speak to the issue of whether anyone should have them. (This is not the place for a discussion of the feasibility of the remedies proposed by the disarmament community, but let us at least acknowledge the existence of a real moral issue.) But this matter has nothing to do with “unfairness” per se – and to the extent that it purports to, one should give it little credence. If indeed nuclear weapons do menace the survival of humanity, it is essentially irrelevant whether their possession is “unfairly” distributed – and it is certainly no solution to make the global balance of weaponry more “fair” by allowing more countries to have them. (Disarmament advocates hope to address the fairness problem by eliminating nuclear weapons, of course, but this is just icing. Disarmament is almost never articulated as being driven primarily by fairness; the critical part of that argument is instead consequentialist, stressing the dangers that any nuclear weapons are said to present.) As a moral critique, in other words, the fair/unfair dichotomy fails to speak intelligibly to the world’s nuclear dilemma. It isn’t really about “fairness” at all.¶ Given the entanglement of nuclear weapons issues with quasi-existential questions potentially affecting the survival of millions or perhaps even billions of people, moreover, it stands to reason that an “unfair” outcome that nonetheless staves off such horrors is a **perfectly good solution**. On this scale, one might say, non-catastrophe entirely trumps accusations of “unfairness.” Questions of stability are far more important than issues of asymmetric distribution.¶ This, of course, has powerful implications for nonproliferation policy, because pointing out the hollowness of the “unfairness” argument as applied to nuclear weapons suggests the moral sustainability of nonproliferation even if complete nuclear disarmament cannot be achieved and the world continues to be characterized by inequalities in weapons possession. We forget this at our collective peril.¶ Don’t get me wrong. “Unfairness” arguments will presumably continue to have a political impact upon the diplomacy of nuclear nonproliferation, either as a consequence of genuine resentment or as a cynical rationalization for the destabilizing pursuit of dangerous capabilities. (Indeed, one might even go so far as to suspect that the emergence of the “unfairness” critique in modern diplomatic discourse is in some sense partly the result of how morally compelling nonproliferation is, in this context, irrespective of the “fairness” of “have/have not” outcomes. Precisely because the moral case for nonproliferation-driven inequality is so obvious and so compelling if such imbalance serves the interests of strategic stability, perhaps it was necessary to develop a new rationale of “fairness” to help make proliferation aspirations seem more legitimate. Skraelings, one imagines, did not need an elaborate philosophy of “fairness” in order to justify trying to steal iron weapons; the desirability of such tools was simply obvious, and any effort to obtain them unsurprising and not in itself condemnable.) But even in this democratic and egalitarian age, merely to incant the mantra of “unfairness” – or to inveigh against the existence of “haves” when there also exist “have nots” – is not the same thing as having a compelling moral argument. Indeed, I would submit that we lose our moral bearings if we allow “unfairness” arguments to distract us from what is really important here: substantive outcomes in the global security environment.¶ “Unfairness,” in other words, is an overrated critique, and “fairness” is an overrated destination. At least where nuclear weapons are concerned, there are more important considerations in play. Let us not forget this.

#### Perm solves the K best:

#### Prolif exacerbates inequality—turns the K

Biswas 1 [Shampa Biswas, Whitman College Politics Professor, December 2001, “Nuclear apartheid" as political position: race as a postcolonial resource?, Alternatives 26.4]

At one level, as Partha Chatterjee has pointed out, the concept of apartheid relates to a discourse about "democracy." (49) To use apartheid to designate the unequal distribution of nuclear resources then is also simultaneously to draw attention to the undemocratic character of international relations--or, more literally, the exclusion of a group of people from some kind of legitimate and just entitlement. More specifically, to talk in terms of nuclear haves and have-nots is to talk in terms of a concept of democratic justice based on the "possession" (or lack thereof) of something. "Apartheid," as Sumit Sarkar points out, "implies as its valorised Other a notion of equal rights." (50) But that this something is "nuclear weapons" complicates the issue a great deal. If the vision of democracy that is implicit in the concept of nuclear apartheid implies a world of "equal possession" of nuclear weapons, a position implied in the Indian decision to test, that is a frightening thought indeed. Yet surely even India does not subscribe to that vision of democracy. "Would India," asks Sarkar, "welcome a nuclearised Nepal or Bangladesh?" (51) If Jaswant Singh is serious that "the country"s national security in a world of nuclear proliferation lies either in global disarmament or in exercise of the principle of equal and legitimate security for all," (52) then it should indeed support the "equal and legitimate" nuclearization of its neighbors, which is extremely unlikely given its own demonstrated hegemonic aspirations in the South Asian region. (53) Further, if India does indeed now sign the NPT and the CTBT, and sign them in the garb of a nuclear power as it wants to do, what does that say about its commitment to nuclear democracy? Even if India and Pakistan were to be included in the treaties as NWSs, all that would do is expand the size of the categories, not delegitimize the unequal privileges and burdens written into the categories themselves. ¶ Indian military scientists claim that India has now accumulated enough data for reliable future weaponization without explosive testing, and Indian leaders have, since the tests, indicated more willingness to sign the CTBT. India has already voluntarily accepted restraints on the exports of nuclear-related materials, as required by the NPT. According to an Indian strategic analyst with respect to negotiation of the Fissile Material Cut-Off Treaty, the next major arms-control treaty to be discussed in the Conference on Disarmament, "The key question in relation to the FMCT is not if it is global and nondiscriminatory. It is whether India has sufficient nuclear material at hand to maintain a credible nuclear deterrent." (54) If all India ever wanted was to move from the side of the discriminated to the side of the discriminators, so much for speaking for democratic ideals through the symbol of nuclear apartheid. (55) ¶ There are several troublesome issues here with respect to the concept of "nuclear democracy." On the one hand, it seems clear that the widespread proliferation of nuclear weapons sits ill at ease with any notion of democratic entitlement. It seems that rather than equalizing the possession of nuclear weapons, **it would be equalizing the dispossession of nuclear weapons that entails a more compelling democratic logic.** (56) On the other hand, there is also the question of the fundamentally undemocratic nature of nuclear weapons themselves. At one level, the sheer scope of such weapons to kill and destroy indiscriminately (a democratic logic here?) renders any laws of 'just war" moot. As Braful Bidwai and Achin Vanaik point out, the very use of nuclear weapons would be to break the principle of proportionate use of force, and such weapons clearly cannot be made to distinguish between combatants and noncombatants as required in the just conduct of war. (57) ¶ In this context, it might be worth pointing to the 1996 ruling by the International Court of Justice at the Hague that stipulated that the "the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict and, in particular, the principles and rules of humanitarian law." (58) If the regulation of war can be considered a democratic exercise, then nuclear weapons by their very nature make that exercise futile. At another level is the secrecy that has historically and perhaps necessarily accompanied the development of nuclear-weapons programs, relegated to an aspect of the national-security state that is immunized from democratic scrutiny. Chatterjee argues that nuclear weapons involve a technology that is intrinsically undemocratic -- both domestically and internationally -- since the enormous destructive potential that they embody requires a great deal of secrecy and inaccessibility. (59) Itty Abraham's excellent analysis shows how the intertwined emergence of the independent Indian state and the atomic-energy establishment legally foreclosed the democratic and institutional oversight of the entire atomic-energy enterprise because of its proximity to national security. In other words, the state sponsorship and control of nuclear science, and indeed its constitution in and through nuclear science, makes both science and the state susceptible to undemocratic governance. (60)

#### Turns orientalism

Biswas 1 [Shampa Biswas, Whitman College Politics Professor, December 2001, “Nuclear apartheid" as political position: race as a postcolonial resource?, Alternatives 26.4]

Where does that leave us with the question of "nuclear apartheid"? As persuasive as the nuclear-apartheid argument may be at pointing to one set of global exclusions, its complicity in the production of boundaries that help sustain a whole other set of exclusions also makes it suspect. It is precisely the resonances of the concept of apartheid, and the strong visceral response it generates, that gives it the ability to bound and erase much more effectively. In one bold move, the nuclear-apartheid argument announces the place of nuclear weaponry as the arbiter of global power and status, and how its inaccessibility or unavailability to a racialized Third World relegates it forever to the dustheap of history. It thus makes it possible for "Indians" to imagine themselves as a "community of resistance." However, with that same stroke, the nuclear-apartheid position creates and sustains yet another racialized hierarchy, bringing into being an India that is exclusionary and oppressive. And it is precisely the boldness of this racial signifier that carries with it the ability to erase, mask, and exclude much more effectively. In the hands of the BJP, the "nuclear apartheid" position becomes dangerous--because the very boldness of this racial signifier makes it possible for the BJP to effect closure on its hegemonic vision of the Hindu/Indian nation. Hence, this article has argued, in taking seriously the racialized exclusions revealed by the use of the "nuclear apartheid" position at the international level, one must simultaneously reveal another set of racialized exclusions effected by the BJP in consolidating its hold on state power. I have argued that comprehending the force and effect of the invocation of "race" through the nuclear-apartheid position means to understand this mutually constitutive co-construction of racialized domestic and international hierarchical orders.

### AT: IFR 🡪 Prolif

#### IFR solves prolif – no way to convert it to nuclear weapon

**Brook 9** [“Response to an Integral Fast Reactor (IFR) critique”, 21 February 2009 by Barry Brook, professor in the School of Earth and Environmental Sciences at the University of Adelaide, where he holds the Sir Hubert Wilkins Chair of Climate Change]

3. IFR envisages transmutation (bombarding some of the more problemtatic long-lived waste radionuclides to convert them to less problematic, shorter lived radionuclides) but this is problematic because i) it involves the proliferation risks associated with one or another form of reprocessing/partitioning of spent fuel into different streams (and thus facilitating plutonium separation, even if that is not envisaged during routine operations) and ii) the technology has been explored for decades but is still a long way from being mature.¶ [BWB] For answer to the proliferation risks, see above. Regarding the possiblity of reprocessing to purify plutonium:¶ “The diversion of nuclear fuel for the purpose of making bombs has been a concern, although presently the handling and destruction of nuclear weapons material is the primary issue. In the IFR, the nature of the fuel reprocessing is such that the fl remains highly radioactive at all times. Fuel can only be handled in shielded cells or transported in casks weighing many tons. In addition, because the fuel recycle facility is located on-site, there is no transportation of nuclear which could create an opportunity for diversion. In any event, IFR fuel is not suitable for weapons without extensive processing in very expensive facilities. The potential also exists for the IFR to use weapons material for fuel, thus eliminating it, while producing electricity.”¶ [GS] Near-term, the IFR makes PUREX illegitimate and plutonium inaccessible. Long term, it relieves future generations of the responsibility to guard the plutonium mines, and of the risks of not guarding them adequately.

### Top-Level

#### Epistemological debate is irrelevant - concrete action is inevitable - they fail to create useful knowledge

**Friedrichs, 09** [Jorg, University Lecturer in Politics at the Oxford Department of International Development, “From Positivist Pretense to Pragmatic Practice Varieties of Pragmatic Methodology in IR Scholarship” Pragmatism and International Relations]

As Friedrich Nietzsche ([1887] 1994:1; cf. Wilson 2002) knew, the knower isstrangely unknown to himself. In fact, it is much morehazardous to contemplate theway how we gain knowledge than to gain such knowledge in the ﬁrst place. This is not to deny that intellectuals are a narcissistic Kratochwil lot, with a penchant for omphaloskepsis. The typical result of their navel-gazing, however, is not increased self-awareness. Scholars are more likely to come up with ex-post-facto rationalizations of how they would like to see their activity than with accurate descriptions of how they go about business. As a result, in science there is a paradoxical divide between positivist pretenseand pragmatic practice. Many prominent scholars proceed pragmatically in gen-erating their knowledge, only to vest it all in a positivist cloak when it comes topresenting results. In the wake of Karl Popper (1963), fantasies about ingeniousconjectures and inexorable refutations continue to hold sway despite the muchmore prosaic way most scholars grope around in the formulation of their theo-ries, and the much less rigorous way they assess the value of their hypotheses. In proposing pragmatism as a more realistic alternative to positivist idealiza-tions, I am not concerned with the original intentions of Charles Peirce. Theseare discussed and enhanced by Ryto¨ vuori-Apunen (this forum). Instead, Ipresent various attempts to make pragmatism work as a methodology for IR scholarship. This includes my own preferred methodology, the pragmaticresearch strategy of abduction. As Fritz Kratochwil and I argue elsewhere, abduction should be at the center of our efforts, while deduction and induction areimportant but auxiliary tools (Friedrichs and 2009).Of course, one does not need to be a pragmatist to proceed in a pragmatic way. Precisely because it is derived from practice, pragmatic commonsense is a sold as the hills. For example, James Rosenau (1988:164) declared many yearsago that he coveted ‘‘a long-held conviction that one advances knowledge most effectively by continuously moving back and forth between very abstract and very empirical levels of inquiry, allowing the insights of the former to exert pressurefor the latter even as the ﬁndings of the latter, in turn, exert pressure for the for-mer, thus sustaining an endless cycle in which theory and research feed on eachother.’’ This was shortly before Rosenau’s turn to postmodernism, while he wasstill touting the virtues of behaviorism and standard scientiﬁc requisites, such asindependent and dependent variables and theory testing. But if we take his state-ment at face value, it appears that Rosenau-the-positivist was guided by a sort of pragmatism for all but the name. While such practical commonsense is certainly valuable, in and by itself, it does not qualify as scientiﬁc methodology. Science requires a higher degree of methodological awareness. For this reason, I am not interested here in pragma-tism as unspoken commonsense, or as a pretext for doing empirical researchunencumbered by theoretical and methodological considerations. Nor am I con-cerned with pragmatism as an excuse for staging yet another epistemological debate. Instead, I am interested in pragmatism as an instrument to go about research with an appropriate degree of epistemological and methodologicalawareness. Taking this criterion as my yardstick, the following three varieties of pragmatist methodology in recent IR scholarship are worth mentioning: theory synthesis, analytic eclecticism (AE), and abduction.Theory synthesis is proposed by Andrew Moravcsik (2003), who claims that theories can be combined as long as they are compatible at some unspeciﬁedfundamental level, and that data will help to identify the right combination of theories. He does not explicitly invoke pragmatism but vests his pleading in apositivist cloak by using the language of theory testing. When looking closer,however, it becomes apparent that his theoretical and methodological noncha-lance is far more pragmatic than what his positivist rhetoric suggests. Moravcsiksees himself in good company, dropping the following names: Robert Keohane,Stephen Walt, Jack Snyder, Stephen Van Evera, Bary Buzan, Bruce Russett, John O’Neal, Martha Finnemore, and Kathryn Sikkink. With the partial excep-tion of Finnemore, however, none of these scholars explicitly links his or herscholarship to pragmatism. They employ pragmatic commonsense in theirresearch, but devoutly ignore pragmatism as a philosophical and methodologicalposition. As a result, it is fair to say that theory synthesis is only on a slightly higher level of intellectual awareness than Rosenau’s statement quoted above. Analytic eclecticism, as advertized by Peter Katzenstein and Rudra Sil, links acommonsensical approach to empirical research with a more explicit commit-ment to pragmatism (Sil and Katzenstein 2005; Katzenstein and Sil 2008).The 7 Even the dean of critical rationalism, Karl Popper, is ‘‘guilty’’ of lapses into pragmatism, for example when hestates that scientists, like hungry animals, classify objects according to needs and interests, although with the impor-tant difference that they are guided in their quest for ﬁnding regularities not so much by the stomach but ratherby empirical problems and epistemic interests (Popper 1963:61–62). 646 Pragmatism and International Relations idea is to combine existing research traditions in a pragmatic fashion and thusto enable the formulation and exploration of novel and more complex sets of problems. The constituent elements of different research traditions are trans-lated into mutually compatible vocabularies and then recombined in novel ways.This implies that most scholars must continue the laborious process of formulat-ing parochial research traditions so that a few cosmopolitan colleagues will beenabled to draw upon their work and construct syncretistic collages. 8 In additionto themselves, Katzenstein and Sil cite a number of like-minded scholars such asCharles Tilly, Sidney Tarrow, Paul Pierson, and Robert Jervis. 9 The ascription isprobably correct given the highly analytical and eclectic approach of these schol-ars. Nevertheless, apart from Katzenstein and Sil themselves none of these schol-ars has explicitly avowed himself to AE.My preferred research strategy is abduction, which is epistemologically asself-aware as AE but minimizes the dependence on existing research traditions.The typical situation for abduction is when we, both in everyday life and as socialscientists, become aware of a certain class of phenomena that interests us for somereason, but for which we lack applicable theories. We simply trust, although we donot know for certain, that the observed class of phenomena is not random. Wetherefore start collecting pertinent observations and, at the same time, applyingconcepts from existing ﬁelds of our knowledge. Instead of trying to impose anabstract theoretical template (deduction) or ‘‘simply’’ inferring propositions fromfacts (induction), we start reasoning at an intermediate level (abduction). Abduction follows the predicament that science is, or should be, above all amore conscious and systematic version of the way by which humans have learnedto solve problems and generate knowledge in their everyday lives. As it iscurrently practiced, science is often a poor emulator of what we are able toachieve in practice. This is unfortunate because human practice is the ultimatemiracle. In our own practice, most of us manage to deal with many challenging situations. The way we accomplish this is completely different from**,** and far moreefﬁcient than, the way knowledge is generated according to standard scientiﬁc methods. If it is true that in our own practice we proceed not so much by induction or deduction but rather by abduction, then science would do well tomimic this at least in some respects. 10 Abduction has been invoked by numerous scholars, including Alexander Wendt, John Ruggie, Jeffrey Checkel, Martin Shapiro, Alec Stone Sweet, andMartha Finnemore. While they all use the term abduction, none has ever thor-oughly speciﬁed its meaning. To make up for this omission, I have developedabduction into an explicit methodology and applied it in my own research oninternational police cooperation (Friedrichs 2008). Unfortunately, it is impossi-ble to go into further detail here. Readers interested in abduction as a way toadvance international research and methodology can also be referred to my recent article with Fritz Kratochwil (Friedrichs and Kratochwil 2009).On a ﬁnal note, we should be careful not to erect pragmatism as the ultimateepistemological fantasy to caress the vanity of Nietzschean knowers unknown tothemselves, namely that they are ingeniously ‘‘sorting out’’ problematic situa-tions. Scientiﬁc inquiry is not simply an intimate encounter between a researchproblem and a problem solver. It is a social activity taking place in communitiesof practice (Wenger 1998). Pragmatism must be neither reduced to the utility of results regardless of their social presuppositions and meaning, nor to the 8 Pace Rudra Sil (this forum), the whole point about eclecticism is that you rely on existing traditions to blendthem into something new. There is no eclecticism without something to be eclectic about. 9 One may further expand the list by including the international society approach of the English school (Ma-kinda 2000), as well as the early Kenneth Waltz (1959). 10 Precisely for this reason, abduction understood as ‘Inference to the Best Explanation’ plays a crucial role inthe ﬁeld of Artiﬁcial Intelligence. 647 The Forum fabrication of consensus among scientists. Pragmatism as the practice of dis-cursive communities and pragmatism as a device for the generation of useful knowledge are two sides of the same coin

### AT: Consumption

#### Consumption-only focus fails – ignores production-oriented environmental degradation

Holmes 7 (Dave, “A socialist view of global warming: change the system, not the climate!”, Google Books, accessed: 6/26/12)//AMV

Such views among genuine environmental activists reflect a well-meaning but ultimately utopian belief that if only enough of us decide to drastically reduce our demand on the world’s resources — via greatly reduced personal consumption, purchasing from firms with sustainable production techniques and non-polluting technologies — big business and governments will respond to “market signals” and accept and adapt to a slow-growth or no-growth economy. Of course, we should not dismiss the importance of environmental consciousness and radicalisation, which is often expressed in attempts to live in ways consistent with sustainability. It is a good thing if people try to organise their lives so that they live more ecologically. But we have to be clear that that alone will not be enough to halt the crisis. It certainly cannot be the main strategy of the mass environment movement, as it will let the real culprits off the hook and divert precious activist energy away from the underlying systemic dynamic that is driving ecological degradation. As Marxist ecologist John Bellamy Foster explained in a very useful and accessible article published in the Monthly Review magazine in February 1995,6 behind most appeals for individual “ecological morality”, “there lies the presumption that we live in a society where the morality of the individual is the key to the morality of society. If people as individuals could simply change their moral stance with respect to nature and alter their behaviour in areas such as propagation, consumption, and the conduct of business, all would be well.” However, Foster continues: “What is all too often overlooked in such calls for moral transformation is the central institutional fact of our [capitalist] society: what might be called the global ‘treadmill of production’.”

#### Permutation do both – solves better and the aff is a net-benefit

Bryant and Goodman 4 - \* PhD in Politics from the School of Oriental and African Studies, \*\*Professor of Communication Studies

Raymond and Michael, “Consuming Narratives: The Political Ecology of 'Alternative' Consumption,” Transactions of the Institute of British Geographers, New Series, Vol. 29, No. 3

The consumption practices of the conservation- and solidarity-seeking commodity cultures described here offer one alternative to the call for a politics of redistribution. In the end, these cultures offer a privileged notion of transnational 'commun- ity' given the relatively high cost of purchasing commodities such as organic cereal and fair trade coffee. True, commodities that 'speak' to 'altern- ative' consumers can possibly make them more aware of what is happening to tropical environ- ments and small-scale producers. And yet, only those that can afford to pay the economic premium can take part in this form of 'resistance'. Thus, 'moral' commodities may become 'alternative' in the larger sense by eschewing more progressive re- constructions of 'moral economy'. The creation of niche markets gives the North, albeit in geographi- cally variable ways, the ability to 'tune in but drop out' of both conventional global economies and more demanding forms of resistance to social injus- tice and environmental degradation. A field of political ecology oriented towards the conceptual- ization of production and consumption dynamics is uniquely situated to explore the ambiguities of North/South connections evinced by alternative consumption-related politics. Third, this paper builds on work that challenges dualistic thinking that has bedevilled human geo- graphy for some time. Examples of these schisms (and authors that challenge them) include those of nature/society (e.g. Murdoch 1997; Whatmore 2002), discursive/material (e.g. Cook and Crang 1996) and cultural/economic (e.g. Jackson 2002b; Sayer 2001). Considering together consumption and the commoditization of political ecology narrat- ives further complicates the 'hybrid' or 'mutant' notions of landscape change and development (Escobar 1999; Arce and Long 2000; Bebbington 2000). Breaking down the dualisms of production and consumption thus should provide critical space from which to examine the political ecologies of (alternative) development.9 In some ways, starting from processes of commoditization and associated narratives of development allows the researcher to go 'forward' into the processes and meanings of consumption as well as 'backwards' along the powerful socio-economic and ecological networks of production and development.

### AT: State Focused-Solutions Bad

#### State focused nuclear power solutions key – solves their impact better

Nordhaus 11, chairman – Breakthrough Instiute, and Shellenberger, president – Breakthrough Insitute, MA cultural anthropology – University of California, Santa Cruz, 2/25/‘11

(Ted and Michael, <http://thebreakthrough.org/archive/the_long_death_of_environmenta>)

Tenth, we are going to have to get over our suspicion of technology, especially nuclear power. There is no credible path to reducing global carbon emissions without an enormous expansion of nuclear power. It is the only low carbon technology we have today with the demonstrated capability to generate large quantities of centrally generated electrtic power. It is the low carbon of technology of choice for much of the rest of the world. Even uber-green nations, like Germany and Sweden, have reversed plans to phase out nuclear power as they have begun to reconcile their energy needs with their climate commitments. Eleventh, we will need to embrace again the role of the state as a direct provider of public goods. The modern environmental movement, borne of the new left rejection of social authority of all sorts, has embraced the notion of state regulation and even creation of private markets while largely rejecting the generative role of the state. In the modern environmental imagination, government promotion of technology - whether nuclear power, the green revolution, synfuels, or ethanol - almost always ends badly. Never mind that virtually the entire history of American industrialization and technological innovation is the story of government investments in the development and commercialization of new technologies. Think of a transformative technology over the last century - computers, the Internet, pharmaceutical drugs, jet turbines, cellular telephones, nuclear power - and what you will find is government investing in those technologies at a scale that private firms simply cannot replicate. Twelveth, big is beautiful. The rising economies of the developing world will continue to develop whether we want them to or not. The solution to the ecological crises wrought by modernity, technology, and progress will be more modernity, technology, and progress. The solutions to the ecological challenges faced by a planet of 6 billion going on 9 billion will not be decentralized energy technologies like solar panels, small scale organic agriculture, and a drawing of unenforceable boundaries around what remains of our ecological inheritance, be it the rainforests of the Amazon or the chemical composition of the atmosphere. Rather, these solutions will be: large central station power technologies that can meet the energy needs of billions of people increasingly living in the dense mega-cities of the global south without emitting carbon dioxide, further intensification of industrial scale agriculture to meet the nutritional needs of a population that is not only growing but eating higher up the food chain, and a whole suite of new agricultural, desalinization and other technologies for gardening planet Earth that might allow us not only to pull back from forests and other threatened ecosystems but also to create new ones. The New Ecological Politics The great ecological challenges that our generation faces demands an ecological politics that is generative, not restrictive. An ecological politics capable of addressing global warming will require us to reexamine virtually every prominent strand of post-war green ideology. From Paul Erlich's warnings of a population bomb to The Club of Rome's "Limits to Growth," contemporary ecological politics have consistently embraced green Malthusianism despite the fact that the Malthusian premise has persistently failed for the better part of three centuries. Indeed, the green revolution was exponentially increasing agricultural yields at the very moment that Erlich was predicting mass starvation and the serial predictions of peak oil and various others resource collapses that have followed have continue to fail. This does not mean that Malthusian outcomes are impossible, but neither are they inevitable. We do have a choice in the matter, but it is not the choice that greens have long imagined. The choice that humanity faces is not whether to constrain our growth, development, and aspirations or die. It is whether we will continue to innovate and accelerate technological progress in order to thrive. Human technology and ingenuity have repeatedly confounded Malthusian predictions yet green ideology continues to cast a suspect eye towards the very technologies that have allowed us to avoid resource and ecological catastrophes. But such solutions will require environmentalists to abandon the "small is beautiful" ethic that has also characterized environmental thought since the 1960's. We, the most secure, affluent, and thoroughly modern human beings to have ever lived upon the planet, must abandon both the dark, zero-sum Malthusian visions and the idealized and nostalgic fantasies for a simpler, more bucolic past in which humans lived in harmony with Nature.

#### Incentives-based environmental action in the context of nuclear power is good---key to policy effectiveness

Economist 5 (The Economist, April 21, “Rescuing environmentalism”, <http://www.economist.com/node/3888006>

THE environmental movement's foundational concepts, its method for framing legislative proposals, and its very institutions are outmoded. Today environmentalism is just another special interest.” Those damning words come not from any industry lobby or right-wing think-tank. They are drawn from “The Death of Environmentalism”, an influential essay published recently by two greens with impeccable credentials. They claim that environmental groups are politically adrift and dreadfully out of touch. They are right. In America, greens have suffered a string of defeats on high-profile issues. They are losing the battle to prevent oil drilling in Alaska's wild lands, and have failed to spark the public's imagination over global warming. Even the stridently ungreen George Bush has failed to galvanise the environmental movement. The solution, argue many elders of the sect, is to step back from day-to-day politics and policies and “energise” ordinary punters with talk of global-warming calamities and a radical “vision of the future commensurate with the magnitude of the crisis”. Europe's green groups, while politically stronger, are also starting to lose their way intellectually. Consider, for example, their invocation of the woolly “precautionary principle” to demonise any complex technology (next-generation nuclear plants, say, or genetically modified crops) that they do not like the look of. A more sensible green analysis of nuclear power would weigh its (very high) economic costs and (fairly low) safety risks against the important benefit of generating electricity with no greenhouse-gas emissions. Small victories and bigger defeats The coming into force of the UN's Kyoto protocol on climate change might seem a victory for Europe's greens, but it actually masks a larger failure. The most promising aspect of the treaty—its innovative use of market-based instruments such as carbon-emissions trading—was resisted tooth and nail by Europe's greens. With courageous exceptions, American green groups also remain deeply suspicious of market forces. If environmental groups continue to reject pragmatic solutions and instead drift toward Utopian (or dystopian) visions of the future, they will lose the battle of ideas. And that would be a pity, for the world would benefit from having a thoughtful green movement. It would also be ironic, because far-reaching advances are already under way in the management of the world's natural resources—changes that add up to a different kind of green revolution. This could yet save the greens (as well as doing the planet a world of good). “Mandate, regulate, litigate.” That has been the green mantra. And it explains the world's top-down, command-and-control approach to environmental policymaking. Slowly, this is changing. Yesterday's failed hopes, today's heavy costs and tomorrow's demanding ambitions have been driving public policy quietly towards market-based approaches. One example lies in the assignment of property rights over “commons”, such as fisheries, that are abused because they belong at once to everyone and no one. Where tradable fishing quotas have been issued, the result has been a drop in over-fishing. Emissions trading is also taking off. America led the way with its sulphur-dioxide trading scheme, and today the EU is pioneering carbon-dioxide trading with the (albeit still controversial) goal of slowing down climate change. These, however, are obvious targets. What is really intriguing are efforts to value previously ignored “ecological services”, both basic ones such as water filtration and flood prevention, and luxuries such as preserving wildlife. At the same time, advances in environmental science are making those valuation studies more accurate. Market mechanisms can then be employed to achieve these goals at the lowest cost. Today, countries from Panama to Papua New Guinea are investigating ways to price nature in this way (see article). Rachel Carson meets Adam Smith If this new green revolution is to succeed, however, three things must happen. The most important is that prices must be set correctly. The best way to do this is through liquid markets, as in the case of emissions trading. Here, politics merely sets the goal. How that goal is achieved is up to the traders. A proper price, however, requires proper information. So the second goal must be to provide it. The tendency to regard the environment as a “free good” must be tempered with an understanding of what it does for humanity and how. Thanks to the recent Millennium Ecosystem Assessment and the World Bank's annual “Little Green Data Book” (released this week), that is happening. More work is needed, but thanks to technologies such as satellite observation, computing and the internet, green accounting is getting cheaper and easier. Which leads naturally to the third goal, the embrace of cost-benefit analysis. At this, greens roll their eyes, complaining that it reduces nature to dollars and cents. In one sense, they are right. Some things in nature are irreplaceable—literally priceless. Even so, it is essential to consider trade-offs when analysing almost all green problems. The marginal cost of removing the last 5% of a given pollutant is often far higher than removing the first 5% or even 50%: for public policy to ignore such facts would be inexcusable. If governments invest seriously in green data acquisition and co-ordination, they will no longer be flying blind. And by advocating data-based, analytically rigorous policies rather than pious appeals to “save the planet”, the green movement could overcome the scepticism of the ordinary voter. It might even move from the fringes of politics to the middle ground where most voters reside. Whether the big environmental groups join or not, the next green revolution is already under way. Rachel Carson, the crusading journalist who inspired greens in the 1950s and 60s, is joining hands with Adam Smith, the hero of free-marketeers. The world may yet leapfrog from the dark ages of clumsy, costly, command-and-control regulations to an enlightened age of **informed, innovative, incentive-based greenery**.

### Util

#### Prefer util

Cummiskey 90 – Professor of Philosophy, Bates (David, Kantian Consequentialism, Ethics 100.3, p 601-2, p 606, jstor, AG)

We must not obscure the issue by characterizing this type of case as the sacrifice of individuals for some abstract "social entity." It is not a question of some persons having to bear the cost for some elusive "overall social good." Instead, the question is whether some persons must bear the inescapable cost for the sake of other persons. Nozick, for example, argues that "to use a person in this way does not sufficiently respect and take account of the fact that he is a separate person, that his is the only life he has."30 Why, however, is this not equally true of all those that we do not save through our failure to act? By emphasizing solely the one who must bear the cost if we act, one fails to sufficiently respect and take account of the many other separate persons, each with only one life, who will bear the cost of our inaction. In such a situation, what would a conscientious Kantian agent, an agent motivated by the unconditional value of rational beings, choose? We have a duty to promote the conditions necessary for the existence of rational beings, but both choosing to act and choosing not to act will cost the life of a rational being. Since the basis of Kant's principle is "rational nature exists as an end-in-itself' (GMM, p. 429), the reasonable solution to such a dilemma involves promoting, insofar as one can, the conditions necessary for rational beings. If I sacrifice some for the sake of other rational beings, I do not use them arbitrarily and I do not deny the unconditional value of rational beings. **Persons** may **have "dignity**, an unconditional and incomparable value" that transcends any market value (GMM, p. 436), **but**, as rational beings, persons **also** have **a fundamental equality which dictates that some must** sometimes **give way for the sake of others.** The formula of the end-in-itself thus does not support the view that we may never force another to bear some cost in order to benefit others. If one focuses on the equal value of all rational beings, then equal consideration dictates that one sacrifice some to save many. [continues] According to Kant, the objective end of moral action is the existence of rational beings. Respect for rational beings requires that, in deciding what to do, one give appropriate practical consideration to the unconditional value of rational beings and to the conditional value of happiness. Since agent-centered constraints require a non-value-based rationale, the most natural interpretation of the demand that one give equal respect to all rational beings lead to a consequentialist normative theory. We have seen that there is no sound Kantian reason for abandoning this natural consequentialist interpretation. In particular, a consequentialist interpretation does not require sacrifices which a Kantian ought to consider unreasonable, and it does not involve doing evil so that good may come of it. It simply requires an uncompromising commitment to the equal value and equal claims of all rational beings and a recognition that, in the moral consideration of conduct, one's own subjective concerns do not have overriding importance.

### 2ac at vtl

#### Value to life is inevitable, subjective, and they don’t control the link to it.

**Shermer, 8** –Michael, founder of the Skeptics Society and Editor of Skeptic Magazine, “"The Meaning of Life, the Universe, and Everything"”—Commencement Speech at Whittier College, 5/23/08 http://www.whittier.edu/News/Articles/2008CommencementSpeech.aspx

Purpose is personal, and there are countless activities people engage in to satisfy this deep-seated need.There are, however, a handful of powerful means by which we can bootstrap ourselves toward higher goals that have proven to be especially beneficial to both individuals and society. Science tells us that there are five things you can do to create meaning and purpose in your life. Here they are: 1. Love and family—the bonding and attachment to others increases one's sphere of moral inclusion to care about others as much as, if not more than, oneself. And here I shall take a moment to acknowledge the courage of the California State Supreme Court to increase the possibility of marital happiness to the tens of thousands of gays and lesbians in our state who wish to enjoy the same rights and liberties as everybody else. 2. Meaningful work and career—the sense of purpose derived from discovering one's passion for work drives people to achieve goals so far beyond the needs of themselves that they lift all of us to a higher plane, either directly through the benefits of the work, or indirectly through inspiration. And here let me shift my politics slightly rightward to tell you that not only is it okay to make a lot of money, it is a moral virtue to earn your way to wealth and prosperity, and that market capitalism—conjoined with liberal democracy—is the best hope for humanity's future that we have. 3. Recreation and play—it is vital to take time off from work, get away from the office, hang out with your friends, see new places, veg out, goof off, and explore new activities with no purpose other than their shear enjoyment. (In other words, build into your purpose no purpose at all.) 4. Social and political involvement—as a social primate species endowed by evolution with the moral emotions of guilt and pride, shame and joy, we have a social obligation to our local community and our larger society to participate in the process of determining how best we should live together, and a moral duty to reach out and help those in need. Research shows that those who do so are happier and more fulfilled people. 5. Transcendency and spirituality—a capacity unique to our species, as far as we can tell, that includes aesthetic appreciation, spiritual reflection, and transcendent contemplation through a variety of expressions such as art, music, dance, exercise, meditation, prayer, quiet contemplation, and religious revere, connecting us on the deepest level with that which is outside of ourselves.

#### Util good – all lives are equal or they value some more than others which is unethical – value to life is subjective determined by everyone

### Warming K

#### Failure to engage with market mechanisms only reproduces the worst parts of the status quo – only working with the world as it is renders another world possible

Bryant 12—professor of philosophy at Collin College (Levi, We’ll Never Do Better Than a Politician: Climate Change and Purity, 5/11/12, http://larvalsubjects.wordpress.com/2012/05/11/well-never-do-better-than-a-politician-climate-change-and-purity/)

However, pointing this out and deriding market based solutions doesn’t get us very far. In fact, such a response to proposed market-based solutions is downright dangerous and irresponsible. The fact of the matter is that 1) we currently live in a market based world, 2) there is not, in the foreseeable future an alternative system on the horizon, and 3), above all, we need to do something now. We can’t afford to reject interventions simply **because they don’t meet our ideal conceptions** of how things should be. We have to work with the world that is here, not the one that we would like to be here. And here it’s crucial to note that pointing this out does not entail that we shouldn’t work for producing that other world. It just means that we have to grapple with the world that is actually there before us.¶ It pains me to write this post because I remember, with great bitterness, the diatribes hardcore Obama supporters leveled against legitimate leftist criticisms on the grounds that these critics were completely unrealistic idealists who, in their demand for “purity”, were asking for “ponies and unicorns”. This rejoinder always seemed to ignore that words have power and that Obama, through his profound power of rhetoric, had, at least the power to shift public debates and frames, opening a path to making new forms of policy and new priorities possible. The tragedy was that he didn’t use that power, though he has gotten better.¶ I do not wish to denounce others and dismiss their claims on these sorts of grounds. As a Marxist anarchists, I do believe that we should fight for the creation of an alternative hominid ecology or social world. I think that the call to commit and fight, to put alternatives on the table, has been one of the most powerful contributions of thinkers like Zizek and Badiou. If we don’t commit and fight for alternatives those alternatives will never appear in the world. Nonetheless, we still have to grapple with the world we find ourselves in. And it is here, in my encounters with some Militant Marxists, that I sometimes find it difficult to avoid the conclusion that they are unintentionally aiding and abetting the very things they claim to be fighting. In their refusal to become impure, to work with situations or assemblages as we find them, to sully their hands, they end up reproducing the very system they wish to topple and change. Narcissistically they get to sit there, smug in their superiority and purity, while everything continues as it did before because they’ve refused to become politicians or engage in the difficult concrete work of assembling human and nonhuman actors to render another world possible. As a consequence, they occupy the position of Hegel’s beautiful soul that denounces the horrors of the world, celebrate the beauty of their soul, while depending on those horrors of the world to sustain their own position. ¶ To engage in politics is to engage in networks or ecologies of relations between humans and nonhumans. To engage in ecologies is to descend into networks of causal relations and feedback loops that you cannot completely master and that will modify your own commitments and actions. But there’s no other way, there’s no way around this, and we do need to act now.

### Policymaking Good

#### Framework – the k must prove the whole plan is a bad idea – any other interp moots aff offense and prevents bureaucratic engagement which the 1ac has identified as preferable to their alternative - any plan inclusive alt is a voting issue – doesn’t have a solvency advocate and doesn’t deny the plans desirability consumption is inevitable – we reform it

Doran and Barry 6 – worked at all levels in the environment and sustainable development policy arena - at the United Nations, at the Northern Ireland Assembly and Dáil Éireann, and in the Irish NGO sector. PhD--AND-- Reader in Politics, Queen's University School of Politics, International Studies, and Philosophy. PhD Glasgow (Peter and John, Refining Green Political Economy: From Ecological Modernisation to Economic Security and Sufficiency, Analyse & Kritik 28/2006, p. 250–275, http://www.analyse-und-kritik.net/2006-2/AK\_Barry\_Doran\_2006.pdf)

The aim of this article is to offer a draft of a realistic, but critical, version of green political economy to underpin the economic dimensions of radical views of sustainable development. It is written explicitly with a view to encouraging others to respond to it in the necessary collaborative effort to think through this aspect of sustainable development. Our position is informed by two important observations. As a sign of our times, the crises that we are addressing under the banner of sustainable development (however inadequately) render the distinction between what is ‘realistic’ and ‘radical’ problematic. It seems to us that the only realistic course is to revisit the most basic assumptions embedded within the dominant model of development and economics. Realistically the only longterm option available is radical. Secondly, we cannot build or seek to create a sustainable economy ab nihilo, but must begin—in an agonistic fashion—from where we are, with the structures, institutions, modes of production, laws, regulations and so on that we have. We make this point in Ireland with a story about the motorist who stops at the side of the road to ask directions, only to be told: “Now Ma’m, I wouldn’t start from here if I were you.” ¶ This does not mean simply accepting these as immutable or set in stone— after all, some of the current institutions, principles and structures underpinning the dominant economic model are the very causes of unsustainable development— but we do need to recognise that we must work with (and ‘through’—in the terms of the original German Green Party’s slogan of “marching through the institutions”) these existing structures as well as changing and reforming and in some cases abandoning them as either unnecessary or positively harmful to the creation and maintenance of a sustainable economy and society. Moreover, we have a particular responsibility under the current dominant economic trends to name the neo-liberal project as the hegemonic influence on economic thinking and practice. In the words of Bourdieu/Wacquant (2001), neoliberalism is the new ‘planetary vulgate’, which provides the global context for much of the contemporary political and academic debate on sustainable development. For example, there is a clear hierarchy of trade (WTO) over the environment (Multilateral Environmental Agreements) in the international rules-based systems. At the boundaries or limits of the sustainable development debate in both the UK and the European Union it is also evident that the objectives of competitiveness and trade policy are sacrosanct. As Tim Luke (1999) has observed, the relative success or failure of national economies in head-to-head global competition is taken by ‘geo-economics’ as the definitive register of any one nation-state’s waxing or waning international power, as well as its rising or falling industrial competitiveness, technological vitality and economic prowess. In this context, many believe ecological considerations can, at best, be given only meaningless symbolic responses, in the continuing quest to mobilise the Earth’s material resources. ¶ Our realism is rooted in the demos. The realism with which this paper is concerned to promote recognises that the path to an alternative economy and society must begin with a recognition of the reality that most people (in the West) will not democratically vote (or be given the opportunity to vote) for a completely different type of society and economy overnight. This is true even as the merits of a ‘green economy’ are increasingly recognised and accepted by most people as the logical basis for safeguards and guarantees for their basic needs and aspirations (within limits). The realistic character of the thinking behind this article accepts that consumption and materialistic lifestyles are here to stay. (The most we can probably aspire to is a widening and deepening of popular movements towards **ethical consumption, responsible investment**, and fair trade.) And indeed there is **little to be gained** by proposing alternative economic systems which start from a complete rejection of consumption and materialism. The appeal to realism is in part an attempt to correct the common misperception (and self-perception) of green politics and economics requiring an excessive degree of self-denial and a puritanical asceticism (see Goodin 1992, 18; Allison 1991, 170– 78). While rejecting the claim that green political theory calls for the complete disavowal of materialistic lifestyles, it is true that green politics does require the collective re-assessment of such lifestyles, and does require new economic signals and pedagogical attempts to encourage a delinking—in the minds of the general populus—of the ‘good life’ and the ‘goods life’. This does not mean that we need necessarily require the complete and across the board rejection of materialistic lifestyles. It must be the case that there is room and tolerance in a green economy for people to choose to live diverse lifestyles—some more sustainable than others—so long as these do not ‘harm’ others, threaten long-term ecological sustainability or create unjust levels of socio-economic inequalities. Thus, realism in this context is in part another name for the acceptance of a broadly ‘liberal’ or ‘post-liberal’ (but certainly not anti-liberal) green perspective.2¶ 1. Setting Out¶ At the same time, while critical of the ‘abstract’ and ‘unrealistic’ utopianism that peppers green and radical thinking in this area, we do not intend to reject utopianism. Indeed, with Oscar Wilde we agree that a map of the world that does not have utopia on it, isn’t worth looking at. The spirit in which this article is written is more in keeping with framing green and sustainability concerns within a ‘concrete utopian’ perspective or what the Marxist geographer David Harvey (1996, 433–435) calls a “utopianism of process”, to be distinguished from “closed”, blueprint-like and abstract utopian visions. Accordingly, the model of green political economy outlined here is in keeping with Steven Lukes’ suggestion that a concrete utopianism depends on the ‘knowledge of a self-transforming present, not an ideal future’ (Lukes 1984, 158).¶ It accepts the current dominance of one particular model of green political economy—namely ‘ecological modernisation’ (hereafter referred to EM)—as the preferred ‘political economy’ underpinning contemporary state and market forms of sustainable development, and further accepts the necessity for green politics to positively engage in the debates and policies around EM from a strategic (as well as a normative) point of view. However, it is also conscious of the limits and problems with ecological modernisation, particularly in terms of its technocratic, supply-side and reformist ‘business as usual’ approach, and seeks to explore the potential to radicalise EM or use it as a ‘jumping off’ point for more radical views of greening the economy. Ecological modernisation is a work in progress; and that’s the point. ¶ The article begins by outlining EM in theory and practice, specifically in relation to the British state’s ‘sustainable development’ policy agenda under New Labour.3 While EM as currently practised by the British state is ‘weak’ and largely turns on the centrality of ‘innovation’ and ‘eco-efficiency’, the paper then goes on to investigate in more detail the role of the market within current conceptualisations of EM and other models of green political economy. In particular, a potentially powerful distinction (both conceptually and in policy debates) between ‘the market’ and ‘capitalism’ has yet to be sufficiently explored and exploited as a starting point for the development of radical, viable and attractive conceptions of green political economy as alternatives to both EM and the orthodox economic paradigm. We contend that there is a role for the market in innovation and as part of the ‘governance’ for sustainable development in which eco-efficiency and EM of the economy is linked to non-ecological demands of green politics and sustainable development such as social and global justice, egalitarianism, democratic regulation of the market and the conceptual (and policy) expansion of the ‘economy’ to include social, informal and noncash economic activity and a progressive role for the state (especially at the local/municipal level). Here we suggest that the ‘environmental’ argument or basis of green political economy in terms of the need for the economy to become more resource efficient, minimise pollution and waste and so on, has largely been won. What that means is that no one is disputing the need for greater resource productivity, energy and eco-efficiency. Both state and corporate/business actors have accepted the environmental ‘bottom line’ (often rhetorically, but nonetheless important) as a conditioning factor in the pursuit of the economic ‘bottom line’.

#### And solves tech elitism

**Kuzemko 12** [Caroline Kuzemko, CSGR University of Warwick, Security, the State and Political Agency: Putting ‘Politics’ back into UK Energy, <http://www.psa.ac.uk/journals/pdf/5/2012/381_61.pdf>]

Both Hay (2007) and Flinders and Buller (2006) suggest that there are other forms that depoliticisation can take, or in the terminology of Flinders and Buller ‘tactics’ which politicians can pursue in order to move a policy field to a more indirect governing relationship (Flinders and Buller 2006: 296). For the purposes of understanding the depoliticisation of UK energy policy, however, two of Colin Hay’s forms of depoliticisation are most useful: the ‘… offloading of areas of formal political responsibility to the market…’ and the passing of policymaking responsibility to quasipublic, or independent, authorities (Hay 2007: 82-3). 1 What each of these forms of depoliticisation has in common is the degree to which they can serve, over time, to reduce political capacity by removing processes of deliberation and contestation, thereby reducing the ability for informed agency and choice. In that politics can be understood as being inclusive of processes of deliberation, contestation, informed agency and collective choice the lack of deliberation and capacity for informed agency would result in sub-optimal politics (Hay 2007: 67; cf. Gamble 2000; Wood 2011; Jenkins 2011). There seems little doubt that, with regard to energy as a policy area, the principal of establishing a more indirect governing system had become accepted by UK political elites. One of the very few close observers of UK energy policy from the 1980s to early 2000s claims that both Conservative and New Labour politicians had actively sought to remove energy from politics, making it an ‘economic’ subject: From the early 1980s, British energy policy, and its associated regulatory regime, was designed to transform a state-owned and directed sector into a normal commodity market. Competition and 1 "These"forms"are"referred"to"elsewhere"by"the"author"as"‘marketised’"and"‘technocratic’"depoliticisation"(Kuzemko" 2012b:").liberalization would, its architects hoped, take energy out of the political arena… Labour shared this vision and hoped that energy would drop off the political agenda…. (Helm 2003: 386) 2 As already suggested this paper considers the intention to depoliticise energy to have been reasonably successful. By the early 2000s the Energy Ministry had been disbanded, there was little or no formal Parliamentary debate, energy was not represented at Cabinet level, responsibility for the supply of energy had been passed to the markets, it was regulated by an independent body, and the (cf. Kuzemko 2012b). Furthermore, the newly formed Energy Directorate within the Department of Trade and Industry (DTI), which now had responsibility for energy policy, had no specific energy mandates but instead mandates regarding encouraging the right conditions for business with an emphasis on competition (Helm et al 1989: 55; cf. Kuzemko 2012b: 107). As feared by various analysts who write about depoliticisation as a sub-optimal form of politics, these processes of depoliticisation had arguably resulted in a lack of deliberation about energy and its governance outside of narrow technocratic elite circles. Within these circles energy systems were modelled, language was specific and often unintelligible to others, including generalist politicians or wider publics, and this did, indeed, further encourage a high degree of disengagement with the subject (cf. Kern 2010; Kuzemko 2012b; Stern 1987). Technical language and hiring practices that emphasised certain forms of economic education further isolated elite technocratic circles from political contestation and other forms of knowledge about energy. Arguably, by placing those actors who have been elected to represent the national collective interest at one remove from processes of energy governance the result was a lack of formal political capacity in this policy field. It is worth, briefly, at this point reiterating the paradoxical nature of depoliticisation. Whilst decisions to depoliticise are deeply political, political capacity to deliberate, contest and act in an issue area can be reduced through these processes. Depoliticisation has been an ongoing form of governing throughout the 20 th century it may (Burnham 2001: 464), however, be particularly powerful and more difficult to reverse when underpinned by increasingly dominant ideas about how best to govern. For example Hay, in looking for the domestic sources of depoliticisation in the 1980s and 1990s, suggests that these processes were firmly underpinned by neoliberal and public choice ideas not only about the role of the state but also about the ability for political actors to make sound decisions relating, in particular, to economic governance (Hay 2007: 95-99). Given the degree to which such ideas were held increasingly to be legitimate over this time period depoliticisation was, arguably, genuinely understood by many as a process that would result in better governance (Interviews 1, 2, 3, 15 cf. Hay 2007: 94; Kern 2010). This to a certain extent makes decisions to depoliticise appear both less instrumental but also harder to reverse given the degree to which such ideas become further entrenched via processes of depoliticisation (cf. Kuzemko 2012b: 61-66; Wood 2011: 7).

## 1ar

### AT: Kato

#### Fear of nukes good

Futterman, 91 (JAH, Livermore lab researcher, 1995, Mediation of the Bomb, online, http://www.dogchurch.org/scriptorium/nuke0

I could say that if I didn't do it, someone else would, but that answer was rejected at Nuremberg. (It's also a better reason to leave the weapons program than to stay.) I continue to support the u business with my effort for many reasons, which I discuss throughout this piece. But mostly, I do it because the fear of nuclear holocaust is the only authority my own country or any other has respected so far when it comes to nationalistic urges to make unlimited war. As William L. Shirer states in his preface to *The Rise and Fall of the Third Reich* (Touchstone Books, New York, 1990), "Adolf Hitler is probably the last of the great adventurer-conquerors in the tradition of Alexander, Caesar, and Napoleon, and the Third Reich the last of the empires which set out on the path taken earlier by France, Rome and Macedonia. The curtain was rung down on that phase of history, at least, by the sudden invention of the hydrogen bomb, of the ballistic missile, and of rockets which can be aimed to hit the moon." Now this contrasts with the argument of those who would "reinvent government" by putting up bureaucratic roadblocks to maintaining the reliability of the US nuclear arsenal through research and testing. They reason that if the reliability of everyone's nuclear arsenals declines, everyone will be less likely to try using them. The problem is that some "adventurer-conqueror" may arise and use everyone's doubt about their arsenals to risk massive conventional war instead. An expansionist dictatorship might even risk nuclear war with weapons that are simpler, cruder, less powerful, much riskier (in terms of the possibility of accidental detonation) but much more reliable than our own may eventually become without adequate "stockpile stewardship."[14]

But the inhibitory effect of reliable nuclear weapons goes deeper than Shirer's deterrence of adventurer-conquerors. It changes the way we think individually and culturally, preparing us for a future we cannot now imagine. Jungian psychiatrist Anthony J. Stevens states, [15] "History would indicate that people cannot rise above their narrow sectarian concerns without some overwhelming paroxysm. It took the War of Independence and the Civil War to forge the United States, World War I to create the League of Nations, World War II to create the United Nations Organization and the European Economic Community. Only catastrophe, it seems, forces people to take the wider view. Or what about fear? Can the horror which we all experience when we contemplate the possibility of nuclear extinction mobilize in us sufficient libidinal energy to resist the archetypes of war? Certainly, the moment we become blasé about the possibility of holocaust we are lost. **As long as horror of nuclear exchange remains uppermost we can recognize that nothing is worth it. War becomes the impossible option**. Perhaps horror, the experience of horror, the consciousness of horror, is our only hope. Perhaps horror alone will enable us to overcome the otherwise invincible attraction of war." Thus I also continue engaging in nuclear weapons work to help fire that world-historical warning shot I mentioned above, namely, that as our beneficial technologies become more powerful, so will our weapons technologies, unless genuine peace precludes it. We must build a future more peaceful than our past, if we are to have a future at all, with or without nuclear weapons — a fact we had better learn before worse things than nuclear weapons are invented. If you're a philosopher, this means that I regard the nature of humankind as mutable rather than fixed, but that I think most people welcome change in their personalities and cultures with all the enthusiasm that they welcome death — thus, the fear of nuclear annihilation of ourselves and all our values may be what we require in order to become peaceful enough to survive our future technological breakthroughs.

### Kurusawa

#### Debating about the state is the antidote to state fear mongering—scenario planning by informed groups can counter-act official misinformation; the alternative is political apathy which hardwires governmental lies

**Kurasawa ‘4**

[Fuyuki. Prof of Sociology @ York Univ of Toronto. Constellations, Vol 11 No 4, 2004. Proquest]

State and market institutions may seek to produce a culture of fear by deliberately stretching interpretations of reality beyond the limits of the plausible so as to exaggerate the prospects of impending catastrophes, or yet again, by intentionally promoting certain prognoses over others for instrumental purposes. Accordingly, regressive dystopias can operate as Trojan horses advancing political agendas or commercial interests that would otherwise be susceptible to public scrutiny and opposition. Instances of this kind of manipulation of the dystopian imaginary are plentiful: the invasion of Iraq in the name of fighting terrorism and an imminent threat of use of ‘weapons of mass destruction’; the severe curtailing of American civil liberties amidst fears of a collapse of ‘homeland security’; the neoliberal dismantling of the welfare state as the only remedy for an ideologically constructed fiscal crisis; the conservative expansion of policing and incarceration due to supposedly spiraling crime waves; and so forth. Alarmism constructs and codes the future in particular ways, producing or reinforcing certain crisis narratives, belief structures, and rhetorical conventions. As much as alarmist ideas beget a culture of fear, the reverse is no less true. If fear-mongering is a misappropriation of preventive foresight, resignation about the future represents a problematic outgrowth of the popular acknowledgment of global perils. Some believe that the world to come is so uncertain and dangerous that we should not attempt to modify the course of history; the future will look after itself for better or worse, regardless of what we do or wish. One version of this argument consists in a complacent optimism perceiving the future as fated to be better than either the past or the present. Frequently accompanying it is a self-deluding denial of what is plausible (‘the world will not be so bad after all’), or a naively Panglossian pragmatism (‘things will work themselves out in spite of everything, because humankind always finds ways to survive’).37 Much more common, however, is the opposite reaction, a fatalistic pessimism reconciled to the idea that the future will be necessarily worse than what preceded it. This is sustained by a tragic chronological framework according to which humanity is doomed to decay, or a cyclical one of the endless repetition of the mistakes of the past. On top of their dubious assessments of what is to come, alarmism and resignation would, if widely accepted, undermine a viable practice of farsightedness. Indeed, both of them encourage public disengagement from deliberation about scenarios for the future, a process that appears to be dangerous, pointless, or unnecessary. The resulting ‘depublicization’ of debate leaves dominant groups and institutions (the state, the market, techno-science) in charge of sorting out the future for the rest of us, thus effectively producing a heteronomous social order. How, then, can we support a democratic process of prevention from below? The answer, I think, lies in cultivating the public capacity for critical judgment and deliberation, so that participants in global civil society subject all claims about potential catastrophes to examination, evaluation, and contestation.

#### Reinforcing the state is strategic—your alternative will either get violently crushed or cause private tyranny

**Chomsky 98** – Prof Linguistics, MIT (Noam, The Common Good, p 84-5, AG)

So Argentina is "minimizing the state"—cutting down public expenditures, the way our government is doing, but much more extremely. Of course, when you minimize the state, you maximize something else—and it isn't popular control. What gets maximized is private power, domestic and foreign. I met with a very lively anarchist movement in Buenos Aires, and with other anarchist groups as far away as northeast Brazil, where nobody even knew they existed. We had a lot of discussions about these matters. They recognize that they have to try to use the state—even though they regard it as totally illegitimate. The reason is perfectly obvious: When you eliminate the one institutional structure in which people can participate to some extent—namely the government—you're simply handing over power to unaccountable private tyrannies that are much worse. So you have to make use of the state, all the time recognizing that you ultimately want to eliminate it. Some of the rural workers in Brazil have an interesting slogan. They say their immediate task is "expanding the floor of the cage." They understand that they're trapped inside a cage, but realize that protecting it when it's under attack from even worse predators on the outside, and extending the limits of what the cage will allow, are both essential preliminaries to dismantling it. If they attack the cage directly when they're so vulnerable, they'll get murdered. That's something anyone ought to be able to understand who can keep two ideas in their head at once, but some people here in the US tend to be so rigid and doctrinaire that they don't understand the point. But unless the left here is willing to tolerate that level of complexity, we're not going to be of any use to people who are suffering and need our help—or, for that matter, to ourselves.

### AT: Waste

#### Solves 99% of waste – better than squo – don’t let perfect be the enemy of the good

**Kirsch 9** [Steve Kirsch, founder and CEO of multiple tech companies collectively worth over %241 billion and MS in Electrical Engineering and Computer Science from MIT, November 2009, "Why We Should Build an Integral Fast Reactor Now,"]

Q. What about waste?¶ George Stanford wrote the following in response to a WSJ article:¶ In saying that "There Is No Such Thing as Nuclear Waste" (March 13), William Tucker is even more correct than he realizes. He talks about putting the "plain old U-238" back in the ground, because he thinks it's "non-fissionable." True, U-238 is not as fissionable as U-235 (which is called "fissile"), but all you have to do is put another neutron into a U-238 nucleus, and you soon have fissile Pu-239. In fact, some 30% of the power from today's reactors comes from the fissioning of Pu-239 atoms that used to be U-238.¶ But that's not the half of it. Today's reactors are called "thermal" because their neutrons are slowed down to low ("thermal") speeds. That kind of reactor cannot extract even one percent of the energy in the uranium that was mined to make the fuel. "Fast" reactors, in which the neutrons are not slowed down, have the ability to utilize the remaining 99% -- thereby getting a hundred time as much energy from the uranium that we have dug up.¶ Other countries (India, China, France, Japan, Russia, South Korea) are working to implement fast reactors. The United States used to be the leader in the field, but no longer is, because development of our fast reactor -- the IFR -- was terminated in 1994, for non-technical reasons. However, General Electric continued a low-level effort, and now stands ready to build a commercial-scale demonstration plant, given the needed seed money.¶ With IFRs we could power the nation for centuries without mining another ounce of uranium. The only waste from an IFR is about a ton of fission products (broken uranium atoms) per year for every moderately big (1000 MW) power plant -- and many of those elements have commercial value. Moreover, their radioactivity decays to insignificance within 500 years.