# AFF’s

## version one

### Plan

#### Plan: The United States Federal Government should substantially increase commercial loan guarantees to develop and deploy Power Reactor Innovative Small Module reactors for the purpose of energy production in the United States.

### Advantage 1 is Proliferation

#### Rapid cascade proliferation at the tipping point.

Graham Allison, January/February 2010, Director of Harvard's major Center for Science and International Affairs, as for three decades been a leading analyst of U.S. national security and defense policy with a special interest in nuclear weapons, terrorism, and decision-making, Assistant Secretary of Defense in the first Clinton Administration, Defense Medal for Distinguished Public Service, Organizer of the Commission on America's National Interests, Foreign Policy, “Nuclear Disorder,” Ebsco Host

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 n 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.

#### Proliferation causes nuclear war and extinction – deterrence fails for three reasons.

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The spread of nuclear weapons poses a number of severe threats to international peace and U.S. national security including: nuclear war, nuclear terrorism, emboldened nuclear powers, constrained freedom of action, weakened alliances, and further nuclear proliferation. This section explores each of these threats in turn. Nuclear War. The greatest threat posed by the spread of nuclear weapons is nuclear war. The more states in possession of nuclear weapons, the greater the probability that somewhere, someday, there is a catastrophic nuclear war. A nuclear exchange between the two superpowers during the Cold War could have arguably resulted in human extinction and a nuclear exchange between states with smaller nuclear arsenals, such as India and Pakistan, could still result in millions of deaths and casualties, billions of dollars of economic devastation, environmental degradation, and a parade of other horrors. To date, nuclear weapons have only been used in warfare once. In 1945, the United States used one nuclear weapon each on Hiroshima and Nagasaki, bringing World War II to a close. Many analysts point to sixty-five-plus-year tradition of nuclear non-use as evidence that nuclear weapons are unusable, but it would be naïve to think that nuclear weapons will never be used again. After all, analysts in the 1990s argued that worldwide economic downturns like the great depression were a thing of the past, only to be surprised by the dot-com bubble bursting in the later 1990s and the Great Recession of the late Naughts. [53] This author, for one, would be surprised if nuclear weapons are not used in my lifetime. Before reaching a state of MAD, new nuclear states go through a transition period in which they lack a secure-second strike capability. In this context, one or both states might believe that it has an incentive to use nuclear weapons first. For example, if Iran acquires nuclear weapons neither Iran, nor its nuclear-armed rival, Israel, will have a secure, second-strike capability. Even though it is believed to have a large arsenal, given its small size and lack of strategic depth, Israel might not be confident that it could absorb a nuclear strike and respond with a devastating counterstrike. Similarly, Iran might eventually be able to build a large and survivable nuclear arsenal, but, when it first crosses the nuclear threshold, Tehran will have a small and vulnerable nuclear force. In these pre-MAD situations, there are at least three ways that nuclear war could occur. First, the state with the nuclear advantage might believe it has a splendid first strike capability. In a crisis, Israel might, therefore, decide to launch a preemptive nuclear strike to disarm Iran’s nuclear capabilities and eliminate the threat of nuclear war against Israel. Indeed, this incentive might be further increased by Israel’s aggressive strategic culture that emphasizes preemptive action. Second, the state with a small and vulnerable nuclear arsenal, in this case Iran, might feel use ‘em or loose ‘em pressures. That is, if Tehran believes that Israel might launch a preemptive strike, Iran might decide to strike first rather than risk having its entire nuclear arsenal destroyed. Third, as Thomas Schelling has argued, nuclear war could result due to the reciprocal fear of surprise attack.[54] If there are advantages to striking first, one state might start a nuclear war in the belief that war is inevitable and that it would be better to go first than to go second. In a future Israeli-Iranian crisis, for example, Israel and Iran might both prefer to avoid a nuclear war, but decide to strike first rather than suffer a devastating first attack from an opponent. Even in a world of MAD, there is a risk of nuclear war. Rational deterrence theory assumes nuclear-armed states are governed by rational leaders that would not intentionally launch a suicidal nuclear war. This assumption appears to have applied to past and current nuclear powers, but there is no guarantee that it will continue to hold in the future. For example, Iran’s theocratic government, despite its inflammatory rhetoric, has followed a fairly pragmatic foreign policy since 1979, but it contains leaders who genuinely hold millenarian religious worldviews who could one day ascend to power and have their finger on the nuclear trigger. We cannot rule out the possibility that, as nuclear weapons continue to spread, one leader will choose to launch a nuclear war, knowing full well that it could result in self-destruction. One does not need to resort to irrationality, however, to imagine a nuclear war under MAD. Nuclear weapons may deter leaders from intentionally launching full-scale wars, but they do not mean the end of international politics. As was discussed above, nuclear-armed states still have conflicts of interest and leaders still seek to coerce nuclear-armed adversaries. This leads to the credibility problem that is at the heart of modern deterrence theory: how can you threaten to launch a suicidal nuclear war? Deterrence theorists have devised at least two answers to this question. First, as stated above, leaders can choose to launch a limited nuclear war.[55] This strategy might be especially attractive to states in a position of conventional military inferiority that might have an incentive to escalate a crisis quickly. During the Cold War, the United States was willing to use nuclear weapons first to stop a Soviet invasion of Western Europe given NATO’s conventional inferiority in continental Europe. As Russia’s conventional military power has deteriorated since the end of the Cold War, Moscow has come to rely more heavily on nuclear use in its strategic doctrine. Indeed, Russian strategy calls for the use of nuclear weapons early in a conflict (something that most Western strategists would consider to be escalatory) as a way to de-escalate a crisis. Similarly, Pakistan’s military plans for nuclear use in the event of an invasion from conventionally stronger India. And finally, Chinese generals openly talk about the possibility of nuclear use against a U.S. superpower in a possible East Asia contingency. Second, as was also discussed above leaders can make a “threat that leaves something to chance.”[56] They can initiate a nuclear crisis. By playing these risky games of nuclear brinkmanship, states can increases the risk of nuclear war in an attempt to force a less resolved adversary to back down. Historical crises have not resulted in nuclear war, but many of them, including the 1962 Cuban Missile Crisis, have come close. And scholars have documented historical incidents when accidents could have led to war.[57] When we think about future nuclear crisis dyads, such as India and Pakistan and Iran and Israel, there are fewer sources of stability that existed during the Cold War, meaning that there is a very real risk that a future Middle East crisis could result in a devastating nuclear exchange.

#### Central question of the nonproliferation regime is disposal of nuclear fuel - not solving will undercut the global nuclear order.

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GROWING CYNICISM about the nonproliferation regime also threatens to undercut the global nuclear order. It is easy to see why non-nuclear-weapons states view the regime as an instrument for the haves to deny the have-nots. At the NPT Review Conference in 2000, the United States and other nuclear weapons states promised to take 13 "practical steps" toward meeting their NPT commitments, but later, at the Review Conference in 2005, John Bolton, then the U.S. ambassador to the UN, declared those 2000 undertakings inoperable and subsequently banned any use of the word "disarmament" from the "outcome document" of the UN's 60th anniversary summit. In preparation for the 2010 Review Conference, which will convene in May, diplomats at the IAEA have been joined by prime ministers and presidents in displaying considerable suspicion about a regime that permits nuclear weapons states to keep their arsenals but prevents others from joining the nuclear club. Those suspicions are reflected in governments' unwillingness to accept additional constraints that would reduce the risks of proliferation, such as by ratifying the enhanced safeguards agreement known as the Additional Protocol or approving an IAEA-managed multinational fuel bank to ensure states access to fuel for nuclear energy plants. At the same time, rising concerns about greenhouse gas emissions have stimulated a growing demand for nuclear energy as a clean-energy alternative. There are currently 50 nuclear energy plants under construction, most of them in China and India, and 130 more might soon be built globally. Concern arises not from the nuclear reactors themselves but from the facilities that produce nuclear fuel and dispose of its waste product. The hardest part of making nuclear weapons is producing fissile material: enriched uranium or plutonium. The same setup of centrifuges that enriches uranium ore to four percent to make fuel for nuclear power plants can enrich uranium to 90 percent for nuclear bombs. A nuclear regime that allows any state with a nuclear energy plant to build and operate its own enrichment facility invites proliferation. The thorny question is how to honor the right of non-nuclear-weapons states, granted by the NPT, to the "benefits of peaceful nuclear technology" without such a consequence.

#### Dealing with waste is inevitable in the squo – using PRISM is the only method of securing fissile material from theft and stopping proliferation.

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The temptation, when a great mistake has been made, is to seek ever more desperate excuses to sustain the mistake, rather than admit the terrible consequences of what you have done. But now, in the UK at least, we have an opportunity to make amends. Our movement can abandon this drivel with a clear conscience, for the technology I am about to describe ticks all the green boxes: reduce, reuse, recycle. Let me begin with the context. Like other countries suffering from the idiotic short-termism of the early nuclear power industry, the UK faces a massive bill for the storage and disposal of radioactive waste. The same goes for the waste produced by nuclear weapons manufacturing. But is this really waste, or could we see it another way? In his book Prescription for the Planet, the environmentalist Tom Blees explains the remarkable potential of integral fast reactors (IFRs) (11). These are nuclear power stations which can run on what old nuclear plants have left behind. Conventional nuclear power uses just 0.6% of the energy contained in the uranium that fuels it. Integral fast reactors can use almost all the rest. There is already enough nuclear waste on earth to meet the world’s energy needs for several hundred years, with scarcely any carbon emissions. IFRs need be loaded with fissile material just once. From then on they can keep recycling it, extracting ever more of its energy, until a small fraction of the waste remains. Its components have half-lives of tens rather than millions of years. This makes them more dangerous, but much easier to manage in the long term. When the hot waste has been used up, the IFRs can be loaded with depleted uranium (U-238), of which the world has a massive stockpile (12).The material being reprocessed never leaves the site: it remains within a sealed and remotely-operated recycling plant. Anyone trying to remove it would quickly die. By ensuring the fissile products are unusable, the IFR process reduces the risk of weapons proliferation. The plant operates at scarcely more than atmospheric pressure, so it can’t blow its top. Better still, it could melt down only by breaking the laws of physics. If the fuel pins begin to overheat, their expansion stops the fission reaction. If, like the Fukushima plant, an IFR loses its power supply, it simply shuts down, without human agency. Running on waste, with fewer pumps and valves than conventional plants, they are also likely to be a good deal cheaper (13).So there’s just one remaining question: where are they? In 1994 the Democrats in the US Congress, led by John Kerry, making assertions as misleading as the Swift Boat campaign that was later deployed against him(14), shut down the research programme at Argonne National Laboratories that had been running successfully for 30 years. Even Hazel O’Leary, the former fossil fuel lobbyist charged by the Clinton administration with killing it, admitted that “no further testing” is required to prove its feasibility (15).But there’s a better demonstration that it’s good to go: last week GE Hitachi (GEH) told the British government that it could build a fast reactor within five years to use up the waste plutonium at Sellafield, and if it doesn’t work, the UK won’t have to pay (16). A fast reactor has been running in Russia for 30 years (17) and similar plants are now being built in China and India (18, 19). GEH’s proposed PRISM reactor uses the same generating technology as the IFR, though the current proposal doesn’t include the full reprocessing plant. It should. If the government does not accept GEH’s offer, it will, as the energy department revealed on Thursday, handle the waste through mixed oxide processing (mox) instead (20). This will produce a fuel hardly anyone wants, while generating more waste plutonium than we possess already. It will raise the total energy the industry harvests from 0.6% to 0.8% (21). So we environmentalists have a choice. We can’t wish the waste away. Either it is stored and then buried. Or it is turned into mox fuels. Or it is used to power IFRs. The decision is being made at the moment, and we should determine where we stand. I suggest we take the radical step of using science, not superstition, as our guide.

#### Transitioning to PRISMs stops PUREX/UREX development and solves verification difficulties.

John Carlson, 6-4-2009, director general of the Australian Safeguards and Non-proliferation Office, “New Verification Challenges”, research paper has been commissioned by the International Commission on Nuclear Non-proliferation and Disarmament, <http://icnnd.org/Documents/Carlson_Verification_090604.doc>

The verification challenges for the FMCT are expected to be: having to implement verification approaches in old facilities not designed with verification in mind. These are likely to require intensive verification effort - the more of these facilities that can be shut down and decommissioned, the more manageable the verification task will be:- there will be no reason to continue operation of facilities used only for weapons programs (since the NWS have had informal moratoria on fissile production for weapons for many years, presumably no such facilities are operating now);- there should be little if any need to produce HEU (the states with large naval propulsion programs have extensive HEU stocks to draw on);- with advanced spent fuel recycling technologies which will avoid the need to separate plutonium – such as pyro-processing – on the horizon, there should be little or no requirement for new conventional (Purex-based) reprocessing plants, and existing plants could be phased out over time; the verification workload. This highlights the importance of shutting down as many sensitive facilities as possible, and transitioning to new fuel cycle technologies. A state-level approach, discussed below, will also be important for cost-efficient verification; establishing a reliable capability for detecting undeclared fissile material production.

#### Bargaining breaks down with uncertainty and overconfidence from proliferation.

Erik Gartzke, 5-1-2010, Ph.D. in Political Science from the University of Iowa, associate professor of political science at UC San Diego, “Nuclear Proliferation Dynamics and Conventional Conflict,” http://dss.ucsd.edu/~egartzke/papers/nuketime\_05032010.pdf

A third possibility is that uncertainty about nuclear weapons status increases the hazard of militarized disputes. In contrast to the classical approach that emphasizes power relations, contemporary research on the causes of conflict focuses on the role of asymmetric information (Fearon 1995, Wagner 2000). Nations are more likely to fight if they underestimate one another’s respective resolve or capabilities. Bargaining breaks down when competitors cannot identify acceptable offers. Bargaining failures in turn heighten the probability of disputes. If nations are more likely to fight when they are uncertain about an enemy's capabilities, then capability shocks that make nations uncertain about the balance of power will lead to an increase in conflict. Countries with new military advantages may not yet be perceived as possessing significant advantages. Alternately, the proliferating country may itself overestimate the scale of its advantage. Nuclear proliferation is particularly prone to producing this type of uncertainty, given the extreme nature of nuclear capabilities shocks, the secrecy that enshrouds nuclear programs, and the fact that nuclear capabilities are not actually exercised (as opposed to the influence nuclear nations wield). Just as uncertainty peaks with the advent of possible new nuclear status, it decays quickly with the revelation of nuclear capabilities. Certainty about nuclear weapons capability may make countries no more dispute prone than certainty about the lack of nuclear status. War and peace are conditioned on nuclear secrecy or on nuclear uncertainty, not on the proliferation of nuclear weapons per se.8 The effects of uncertainty about nuclear status on whether nations initiate, or are the targets of, conflict are a bit more complicated to unravel. It is possible that uncertainty about nuclear status could lead to bargaining failure, and thus to a greater risk of a contest for either a potential initiator or a target. In the standard bargaining story, a state possesses an advantage about which its counterpart is dubious, either because other states also claim such an advantage, or because it is difficult to ascertain the consequences of the advantage for warfare, should conflict occur. Opponents can also be uncertain about the resolve or preferences of a nation, underestimating not capabilities but the willingness to use them if necessary. In the context of nuclear proliferation, one can imagine that other nations doubt claims of nuclear capabilities, or that they are uncertain about the willingness of a nation to pursue nuclear brinkmanship under certain circumstances, or that the opponent of the new nuclear power discounts delivery systems, command and control, or some other aspect affecting the veracity of threats. A nascent nuclear nation may feel compelled to press advantages that are not yet accepted by other powers. In doing so, the nuclear state risks a greater likelihood of a military contest. While either a potential attacker or a target can be uncertain about capabilities or resolve, it is much more in the nature of a challenger to be dissatisfied with the status quo. Proliferators are preference outliers. The same incentives that lead nations to seek out nuclear capabilities also encourage attempts to use newly acquired leverage to seek to effect change. Once demands are made, underestimation can lead to bargaining failures and warfare.

#### Controlling the fuel-cycle strengthens tacit bargaining to prohibit war – creates a framework of incentives.

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The nub of the problem is how to preserve the sovereign right of states to enjoy the peaceful benefits of nuclear energy without practising a new discrimination in fuel-cycle capabilities. 33 For even if those states that have not yet developed enrichment and reprocessing facili-ties could be persuaded to rely on external suppliers of fuel, would those that have already crossed the threshold of ‘virtual’ nuclear weapon status be prepared to give up their national control over the fuel-cycle? Just as the NWS argue that the bomb is vital to their security in an uncertain world, so some states view indigenous fuel-cycle capabilities as an insurance against potential adversaries breaking out of the restraints of the NPT, the fear of those nuclear-armed powers outside the treaty and a generalized collapse of the non-proliferation norm. Establishing international controls over the fuel-cycle is a critical challenge in the years ahead. However, it remains to be seen whether those NNWS that are most critical of the failure of the NWS to live up to their promise to disarm can be persuaded to accept constraints on fuel-cycle capabilities in the absence of what the NNWS see as the NWS acting in good faith to honour their obligations under article VI. Even if this were to lead to global zero, there remains the question whether the current NNWS would accept a global nuclear order that froze them into a permanent inferiority vis-à-vis nuclear suppliers who would also have the ultimate leverage of reconstituting their arsenals. George Perkovich and James Acton are right in recognizing that the issue of ‘nuclear equity’ is a major barrier to a future bargain of this kind. They argue that ‘the most acceptable alternative would be to move towards a standard whereby only multinational facilities were allowed everywhere’. 34 But such an ambitious proposal still leaves unanswered the concerns about hedging both inside and outside the treaty. Movement towards a new and far-reaching bargain might seem to require that one of the parties take a leap of trust by accepting substantially greater vulnerability. 35 This is one of the possibilities, but it is unlikely that governments will act in this manner. There is another possibility, which builds on the fact that the signatories of the NPT have already accepted a significant degree of vulner-ability by entering into the treaty in the first place. This alternative rests on one or both parties taking a series of steps that would strengthen the trusting relationship between the NWS and the NNWS. 36 It is at this point that our reinterpretation of the NPT as embodying a set of trusting relationships opens up new ways to think about nuclear non-proliferation policy. If states realize that they have already entered a trusting relationship with other signatories, the actions required to revitalize the grand bargain do not appear as risky as sceptics might suggest. The new bargain could be defended as advan-tageous in terms of pay-offs for both the NWS and the NNWS, exhibiting the intersection of particular interests and the collective interest in non-proliferation. Notwithstanding the pay-offs providing an incentive to enter into the extended bargain (the rationalist approach to trust), a trusting relationship also requires that all parties have good grounds to think that others will do what is right (the binding approach to trust). Establishing the necessary confidence among the signatories that the bargain can be revitalized in the manner set out above would be significantly helped by all NPT states living up to the promises they have made, by a willingness on the part of all signatories to uphold and enforce the norms on which the treaty stands, and by a recognition that trusting relationships are already in place. Historical legacies, feelings of betrayal on all sides—especially on the part of the NNWS— and questioning of others’ motives and integrity create formidable obstacles to strengthening the trusting relationships. What is crucial is that these obstacles do not rule out the possibility of reversing the erosion of trust in the original bargain of the treaty. The fact that the states that have signed up to the treaty argue over each other’s trustworthiness suggests that there is more space for trust than is generally recognized. The steps that are necessary to build trusting relationships both open up and depend on the possibility of new pay-offs as well as mutual bonds. Building trust among the NWS The lack of progress towards nuclear disarmament on the part of the NWS is probably the most contentious sticking point between the signatories of the NPT. The nuclear-armed powers have at best exercised the ‘radical’ rhetoric of admit-ting that they would consider moving towards nuclear disarmament if only the other members of the nuclear club made the first move. Their behaviour is testa-ment to the present limits of their trusting relationship. Which actions and policies could lead to the extension of these limits? Following the end of the Cold War, the context for thinking about nuclear disarmament changed from the bilateral relationship between the United States and the Soviet Union to a more complex web of relationships between the five recognized nuclear powers. Nevertheless, given the enormous size of their nuclear arsenals, the US and Russia still hold the key to strengthening trusting relation-ships among the NWS and ultimately moving towards nuclear disarmament.

#### Counterplan cards and reprocessing turns don’t apply – brain drain, new capacity.

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Many analysts have characterized aboveboard international civil nuclear cooperation—“Atoms for Peace”—as an unmitigated disaster for the cause of nonproliferation. Most of Atoms for Peace’s dwindling band of supporters themselves no longer contest the idea that it has given dozens of developing countries the technical capacity to build nuclear weapons at a time of their 114 Note that despite Tito’s 1974 decision, Gaukhar Mukhatzhanova finds that Solingen’s argument about the impact of liberalizing political coalition interests on regimes’ nuclear intentions generally fits the Yugoslav case pretty well. See Mukhatzhanova, “Nuclear Weapons in the Balkans,” esp. 213–15. choosing. Even such routine practices as the holding of international confer-ences and student exchange programs in the fields of nuclear science and engineering have come under fire. In contrast to these general trends in the literature, this article has offered a more nuanced assessment of the effects of Atoms for Peace. The literature needs to abandon its outdated, oversimplified, techno-centric approach to the supply side of the proliferation equation. When we recognize that “tech-nical” capacity has political foundations, the effects of Atoms for Peace on states’ nuclear weapons capacity appear much different than the literature suggests. In particular, by changing the career opportunities available to the most talented and energetic among the small pool of competent scientific workers in developing country contexts, Atoms for Peace makes their choice for loyalty more complicated, their choice for voice less dangerous, and their choice for exit more feasible. Thus, Atoms for Peace can substantially retard or even reverse the growth of technical capacity to build the bomb, despite the transfer of hardware and know-how that it promotes. The case study of Yugoslavia has substantiated the theorized nonproliferation-promoting effects of Atoms for Peace, even during the pol-icy’s most “na¨ıve” nuclear promotion days of the 1950s and 1960s. As Yu-goslavia represents a hard test for the theory presented here, the findings from this study should be given special heed. We should not be surprised that Atoms for Peace ended up undercutting the Tito regime’s nuclear ambi-tions through such mechanisms as brain drain, since similar findings abound in the broader literature on international technology transfer, with which the proliferation literature needs to engage deeply. This article is not claiming that Atoms for Peace was a silver bullet for nonproliferation in the case of Yugoslavia. Rather, the claim is that over the long run Atoms for Peace intensified and locked in the Yugoslav nuclear program’s poor organizational performance, and accelerated the program’s ultimate collapse. Some readers might be tempted to conclude that since poor organization and management were the root causes of Yugoslavia’s nuclear woes, therefore the effects of Atoms for Peace were superfluous to the outcome. However, it would be wrong to ignore the Atoms for Peace variable simply because it did not singlehandedly prevent a Yugoslav nuclear bomb from coming into being. Recall that up until now, the literature has generally contended that Atoms for Peace helps states leapfrog over their or-ganizational and resource limitations by handing them ready-made solutions to difficult technical problems. So it would already be a significant finding simply to show that Atoms for Peace, even in its heyday in the 1950s and 1960s, actually did not allow them to leapfrog those limitations. But in fact my finding is that Atoms for Peace greatly compounded those limitations, at least in the case of Yugoslavia. My finding turns standard thinking about this question on its head. This finding is not just interestingly counterintu-itive; it also has important implications for United States and international nonproliferation policy. Typical nonproliferation measures, such as export controls and technical safeguards, can hope to achieve little more than to re-strain nuclear programs from moving forward; but I have shown that Atoms for Peace, especially by stimulating the brain drain, ultimately caused the Yu-goslav nuclear program to stumble backward, and made it next to impossible for Belgrade to turn things around. I should also underscore that this article is not claiming that Yugoslavia’s experience with Atoms for Peace necessarily generalizes to every developing country. Some developing countries have been able to leverage civil nuclear cooperation to achieve nuclear weapons more quickly than they otherwise could have. India is often mentioned as a prime example of the danger that Atoms for Peace will unwittingly provide atoms for war. But this article’s focus on Yugoslavia represents a necessary corrective to the literature’s typ-ical focus on proliferation headline-makers like India. Moreover, there are good theoretical reasons to think that the Yugoslav nuclear experience with Atoms for Peace may have been much more typical for developing countries than the Indian experience. First, as noted earlier in the article, the brain drain literature has singled out India as one of the handful of developing countries where the size and quality of the science and technology com-munity are enough to allow it to absorb the hit of a substantial brain drain and yet still benefit through such compensating mechanisms as brain circu-lation, brain diaspora, and brain replacement. 121 Second, the literature on state capacity suggests that the bureaucratic “steel frame” inherited from the British colonial Indian Civil Service, though surely not problem-free, places India far above most other developing countries in terms of its level of state institutionalization. 122 Reflecting these general bureaucratic strengths of the Indian state, the Indian nuclear program was—despite some hiccups—quite well-organized and managed, and this substantially reduced the potential for India’s participation in Atoms for Peace to cause it serious damage. 123 In short, India appears deductively to be a much more exceptional case in the developing world than Yugoslavia, although more in-depth case studies will be necessary before we can say for sure if Yugoslavia’s experience with Atoms for Peace was truly typical or not. 124 121 An anonymous reviewer of this article suggested that we should consider whether, contrary to the general presumption of the proliferation literature, proliferant states often pare back their international civil nuclear cooperation efforts in order to avoid creating complications for their nuclear weapons Proliferation Implications of Civil Nuclear Cooperation 103 It might be that even if Yugoslavia’s experience was typical for its time period, a reenergized Atoms for Peace policy would not have the same nonproliferation-promoting consequences in today’s changed circumstances. But it is also possible to argue that an expanded commitment to overt interna-tional civil nuclear cooperation would have even stronger nonproliferation-promoting consequences in today’s world. After all, the brain drain from the developing world (and post-Communist states) continues to be a major social fact in the contemporary international system. Although the United States demand for the services of developing-world scientists and engineers was already quite high during the 1950s and 1960s, it has become absolutely voracious in recent years. Between 1978 and 2008, the number of U.S. PhD recipients holding temporary visas jumped from 3,475 (11 percent of the total number of doctorates granted by American universities) to 15,246 (31 percent of the total). In the physical sciences, the increase was from 653 (16 percent) to 3,678 (45 percent). In engineering, the increase was from 781 (32 percent) to 4,486 (57 percent). Of these newly minted temporary visa-holding PhDs, in 2008 73.5 percent reported the intention to remain in the United States; this number was generally much higher among those PhDs who had come from developing and post-Communist countries. Meanwhile, the out-migration of the highly skilled is having dramatic consequences on the resource base of sending countries: for instance, 41 percent of all tertiary-educated Caribbeans have emigrated to developed countries; for West Africa the figure is 27 percent; and for East Africa it is 18.4 percent. 125 This mas-sive brain drain is nothing to celebrate; it has caused major social ills in the developing world. But as an empirical matter brain drain is correlated with reduced technological potential, and when it comes to the narrow question of nuclear weapons development, reducing developing countries’ techno-logical potential is not necessarily a bad thing. One could try to turn this argument around and contend that since the brain drain has become so massive, state policies can do little to encourage or discourage it anymore. But in fact the brain drain still depends crucially on facilitative state policies, especially those of the United States and other receiving countries. 126 In the nuclear area in particular, there is no guarantee that those facilitative policies will continue. As noted at the outset of this article, nonproliferation concerns have led the United States to reduce sub-stantially the scope of its international civil nuclear cooperation programs over the past decades, and some nonproliferation advocates want to abolish them altogether.

#### GNEP/IFNEC is faltering - without U.S. leadership in advanced reprocessing technologies - proliferation from the collapsing IFNEC framework will be rampant.

Tim Gitzel, July 2012, senior vice-president and chief operating officer and was appointed president, President and CEO of Cameco, extensive experience in Canadian and international uranium mining activities, executive vice-president, mining business unit for AREVA, College of Law at the University of Saskatchewan, serves as vice-chair on both the Mining Association of Canada and the Canadian Nuclear Association boards of directors, past president of the Saskatchewan Mining Association, and has served on the boards of Sask Energy, co-chair of the Royal Care campaign, a recipient of the Centennial Medal, World Nuclear Association (WNA), “International Framework for Nuclear Energy Cooperation (formerly Global Nuclear Energy Partnership),” <http://www.world-nuclear.org/info/inf117_international_framework_nuclear_energy_cooperation.html>

The International Framework for Nuclear Energy Cooperation (IFNEC), formerly the Global Nuclear Energy Partnership (GNEP), aims to accelerate the development and deployment of advanced nuclear fuel cycle technologies while providing greater disincentives to the proliferation of nuclear weapons. GNEP was initiated by the USA early in 2006, but picked up on concerns and proposals from the International Atomic Energy Agency (IAEA) and Russia. The vision was for a global network of nuclear fuel cycle facilities all under IAEA control or at least supervision. Domestically in the USA, the Global Nuclear Energy Partnership (GNEP) was based on the Advanced Fuel Cycle Initiative (AFCI), and while GNEP faltered with the advent of the Barack Obama administration in Washington from 2008, the AFCI is being funded at higher levels than before for R&D "on proliferation-resistant fuel cycles and waste reduction strategies." Two significant new elements in the strategy are new reprocessing technologies which separate all transuranic elements together (and not plutonium on its own), and advanced burner (fast) reactors to consume the result of this while generating power. GNEP was set up as both a research and technology development initiative and an international policy initiative. It addresses the questions of how to use sensitive technologies responsibly in a way that protects global security, and also how to manage and recycle wastes more effectively and securely. The USA had a policy in place since 1977 which ruled out reprocessing used fuel, on non-proliferation grounds. Under GNEP, reprocessing is to be a means of avoiding proliferation, as well as addressing problems concerning high-level wastes. Accordingly, the US Department of Energy set out to develop advanced fuel cycle technologies on a commercial scale. As more countries consider nuclear power, it is important that they develop the infrastructure capabilities necessary for such an undertaking. As with GNEP, IFNEC partners are working with the IAEA to provide guidance for assessing countries' infrastructure needs and for helping to meet those needs. For countries that have no existing nuclear power infrastructure, IFNEC partners can share knowledge and experience to enable developing countries to make informed policy decisions on whether, when, and how to pursue nuclear power without any need to establish sensitive fuel cycle facilities themselves. With the USA taking a lower profile in GNEP from 2009, the partners are focused on collaboration to make nuclear energy more widely accessible in accordance with safety, security and non-proliferation objectives, as an effective measure to counter global warming, and to improve global energy security. A change of name to International Framework for Nuclear Energy Cooperation was adopted in June 2010, along with a new draft vision statement, which read: "The Framework provides a forum for cooperation among participating states to explore mutually beneficial approaches to ensure the use of nuclear energy for peaceful purposes proceeds in a manner that is efficient, safe, secure, and supports non-proliferation and safeguards." By some accounts, this envisages "cradle to grave" fuel management as central, along with assurance of fuel supply. IFNEC agenda Broadly, IFNEC's mission is the global expansion of nuclear power in a safe and secure manner. A major rationale is reducing the threat of proliferation of nuclear materials and the spread of sensitive nuclear technology for non-peaceful purposes. With greater use of nuclear energy worldwide the possibility of the spread of nuclear material and technology for the development of weapons of mass destruction must be countered to avoid increasing the present threat to global security. A second issue addressed by IFNEC is the efficiency of the current nuclear fuel cycle. The USA, the largest producer of nuclear power, has employed a 'once through' fuel cycle. This practice only uses a part of the potential energy in the fuel, while effectively wasting substantial amounts of useable energy that could be tapped through recycling. The remaining fissionable material can be used to create additional power, rather than treating it as waste requiring long-term storage. Others, notably Europe and Japan, recover the residual uranium and plutonium from the used fuel to recycle at least the plutonium in light water reactors. However, no-one has yet employed a comprehensive technology that includes full actinidea recycle. In the USA, this question is pressing since significant amounts of used nuclear fuel are stored in different locations around the country awaiting shipment to a planned geological repository which was to be at Yucca Mountain in Nevada. This project is delayed, and in any case will fill very rapidly if it is used simply for used fuel rather than the separated wastes after reprocessing it. IFNEC also aims to address cost issues associated with the development and expansion of nuclear power in developing countries. Nuclear programs require a high degree of technical and industrial expertise. This is a serious obstacle for emerging countries attempting to develop nuclear power, although efforts are underway to increase the number of indigenously-trained nuclear experts through a variety of education and training initiatives. Internationally, the countries identified by the US Department of Energy (DOE) as likely participants at both enrichment and recycling ends are the USA, UK, France, Russia and Japan. The USA and Japan agreed to develop a nuclear energy cooperation plan centered on GNEP and the construction of new nuclear power plants. (Japan also intended to participate in the DOE's FutureGen clean coal project, which was abandoned but may possibly be revived.) Several bilateral agreements centered on GNEP/IFNEC have been developed. IFNEC parties and rationale At the first ministerial meeting in May 2007, the USA, China, France, Japan and Russia became formally the founding members of GNEP. Four of the five are nuclear weapons states and have developed full fuel cycle facilities arising from that; the non-nuclear weapons state, Japan, has developed similar facilities to support its extensive nuclear power program. To date, 31 nationsb are participants in IFNEC. Most of these signed the GNEP Statement of Principles1, which established broad guidelines for participation and incorporates seven objectives that touch on each element of GNEP. Under GNEP, so-called 'fuel cycle nations' would provide assured supplies of enriched nuclear fuel to client nations, which would generate electricity before returning the used fuel. The used fuel would then undergo advanced reprocessing so that the uranium and plutonium it contained, plus long-lived minor actinides, could be recycled in advanced nuclear power reactors. Waste volumes and radiological longevity would be greatly reduced by this process, and the wastes would end up either in the fuel cycle or user countries. Nuclear materials would never be outside the strictest controls, overseen by the IAEA. Two sensitive processes in particular would not need to be employed in most countries: enrichment and reprocessing. The limitation on these, by commercial dissuasion rather than outright prohibition, is at the heart of GNEP strategy. A corollary of this dissuasion is that GNEP/IFNEC member nations would be assured of reliable and economic fuel supply under some IAEA arrangement yet to be specified. GNEP/IFNEC work plan The GNEP members set up two principal working groups: The reliable nuclear fuel services working group (RNFS WG) is addressing nuclear fuel leasing and other considerations around comprehensive nuclear fuel supply goals, and includes evaluation of back-end fuel cycle options. The nuclear infrastructure development working group (ID WG) is addressing human resource development, radioactive waste management, small modular reactors, financing options, engagement with specialist organizations and identifying infrastructure requirements for an international nuclear fuel services framework enabling nuclear power deployment in many countries. An early priority was seen to be the development of new reprocessing technologies to enable recycling of most of the used fuel. One of the concerns when reprocessing used nuclear fuel is ensuring that separated fissile material is not used to create a weapon. One chemical reprocessing technology – PUREX – has been employed for over half a century, having been developed in wartime for military use (see page on Processing of Used Nuclear Fuel). This has resulted in the accumulation of 240 tonnes of separated reactor-grade plutonium around the world (though some has been used in the fabrication of mixed oxide fuel). While this is not suitable for weapons use, it is still regarded as a proliferation concern. New reprocessing technologies are designed to combine the plutonium with some uranium and possibly with minor actinides (neptunium, americium and curium), rendering it impractical to use the plutonium in the manufacture of weapons. GNEP/IFNEC creates a framework where states that currently employ reprocessing technologies can collaborate to design and deploy advanced separations and fuel fabrication techniques that do not result in the accumulation of separated pure plutonium. Several developments of PUREX which fit the GNEP/IFNEC concept are being trialled: NUEX separates uranium and then all transuranics (including plutonium) together, with fission products separately (USA). UREX+ separates uranium and then either all transuranics together or simply neptunium with the plutonium, with fission products separately (USA). COEX separates uranium and plutonium (and possibly neptunium) together as well as a pure uranium stream, leaving other minor actinides with the fission products. A variation of this separates americium and curium from the fission products (France). GANEX separates uranium and plutonium as in COEX, then separates the minor actinides plus some lanthanides from the short-lived fission products (France). The central feature of all these variants is to keep the plutonium either with some uranium or with other transuranics which can be destroyed by burning in a fast neutron reactor – the plutonium being the main fuel constituent. Trials of some fuels arising from UREX+ reprocessing in USA are being undertaken in the French Phenix fast reactor. An associated need is to develop the required fuel fabrication plant. That for plutonium with only some uranium and neptunium is relatively straightforward and similar to today's MOX fuel fabrication plants. A plant for fuel including americium and curium would be more complex (due to americium being volatile and curium a neutron emitter). The second main technological development originally envisaged under GNEP is the advanced recycling reactor – basically a fast reactor capable of burning minor actinides. Thus used fuel from light water reactors would be transported to a recycling centre, where it would be reprocessed and the transuranic product (including plutonium) transferred to a fast reactor on site. This reactor, which would destroy the actinides, would have a power capacity of perhaps 1000 MWe. The areas of development for fast reactor technology centre on the need for fast reactors to be cost competitive with current light water reactors. Countries such as France, Russia and Japan have experience in the design and operation of fast reactors and the USA is working with them to accelerate the development of advanced fast reactors that are cost competitive, incorporate advanced safeguards features, and are efficient and reliable. The advent of such fast reactors would mean that reprocessing technology could and should step from the aqueous processes derived from PUREX described above to electrometallurgical processes in a molten salt bath. Separating the actinides then is by electrodeposition on a cathode, without chemical separation of heavy elements as occurs in the Purex and related processes. This cathode product can then be used in a fast reactor, since it is not sensitive to small amounts of impurities. GE Hitachi Nuclear Energy (GEH) is developing this 'Advanced Recycling Center' concept which combines electrometallurgical separation and burning the final product in one or more of its PRISM fast reactors on the same site.2 The separation process would remove uranium, which is recycled to light water reactors; then fission products, which are waste; and finally the actinides including plutonium. With respect to the ultimate disposition of nuclear waste from recycling, three options exist conceptually: User responsibility. The radioactive wastes from the nuclear fuel recycling centre could be considered as processed waste belonging to the user nation that sent its used nuclear fuel to the recycling centre. These wastes might then be shipped back to that user nation for final disposal. Supplier responsibility. The nation hosting the recycling centre might retain the waste or, if a different supplier nation had manufactured the original fuel, all wastes arising from the original fuel could be considered the responsibility of that fuel supplier nation. Third-party responsibility. A disposal facility might be sited in a country that is, in particular cases, neither the supplier nor the user, but is using its technological capability and geological suitability to manage the safe delivery of a commercially and environmentally valuable service. The IFNEC program is considering the ownership and final disposal of waste, but this discussion has not yet reached beyond the preliminary stages. The second and third conceptual options for waste disposal would require one or more international radioactive waste final disposal facilities (see page on International Nuclear Waste Disposal Concepts), and serious discussion of those options will begin only when nations enter into real consideration of the sensitive issue of the hosting of such facilities. In 2012 the RNFS WG is working on a paper entitled ‘Comprehensive Fuel Services: Strategies for the Back End of the Fuel Cycle’ to pursue agreement on the basis for international cooperation on repositories and reprocessing for these activities to be commercialised. Finally, IFNEC is concerned to foster the development of 'grid-appropriate reactors', i.e. smaller units (perhaps 50-350 MWe) for electricity grids of up to 3 GWe. These should incorporate advanced features including safety, simplicity of operation, long-life fuel loads, intrinsic proliferation-resistance and security3. In January 2007, the US Department of Energy (DOE) announced a new strategic plan for GNEP initiatives, including preparation of an environmental impact statement. It would assess three facilities: a fuel recycling centre including reprocessing and fuel fabrication plants; a fast reactor to burn the actinide-based fuel and transmute transuranic elements; and an advanced fuel cycle research facility. The DOE envisaged the first two being industry-led initiatives. In October 2007, the DOE awarded $16 million to four industry consortia for GNEP-related studies. The largest share of this, $5.6 million, went to the International Nuclear Recycling Alliance (INRA) led by Areva and including Mitsubishi Heavy Industries (MHI), Japan Nuclear Fuel Ltd (JNFL), Battelle, BWX Technologies and Washington Group International. INRA was contracted to provide three major studies: technology development roadmaps analyzing the technology needed to achieve GNEP goals; business plans for the development and commercialization of the advanced GNEP technologies and facilities; and conceptual design studies for the fuel recycling centre and advanced recycling reactor. Areva and JNFL are focused on the Consolidated Fuel Treatment Center, a reprocessing plant (which will not separate pure plutonium), and MHI on the Advanced Recycling Reactor, a fast reactor which will burn actinides with uranium and plutonium. These are the two main technological innovations involved with GNEP. In this connection MHI has also set up Mitsubishi FBR Systems (MFBR). INRA appears to have materialized out of a September 2007 agreement between Areva and JNFL to collaborate on reprocessing. Its contract with the DOE was extended in April 2008. A significant setback for the US leadership of GNEP was related to funding by Congress. For FY 2007 the program – including some specifically US aspects – had $167 million, and for FY 2008 Congress cut it back to $120 million, severely constraining the fuel cycle developments. For FY 2009, GNEP did not receive any funding although $120 million was allocated to the Advanced Fuel Cycle Initiative (AFCI), which funds research into reprocessing technologies. The funding for AFCI was only about 40% of the amount requested by the administration. Thus in the USA, GNEP has been largely reduced to an R&D program on advanced fuel cycle technologies. In June 2009, the DOE cancelled the programmatic environmental impact statement for GNEP "because it is no longer pursuing domestic commercial reprocessing, which was the primary focus of the prior Administration's domestic GNEP program."4 Outcomes of IFNEC Under any scenario, the USA and others will require waste repositories; however, recycling used fuel will greatly reduce the amount of waste destined for disposal. For the planned US repository at Yucca Mountain in Nevada, the reprocessing-recycling approach with burning of actinides and perhaps also some long-lived fission products would mean that the effective capacity of such a repository would be increased by a factor of 50 or more. This is due to decreased radiotoxicity and heat loads, as well as reducing greatly the ultimate volume of waste requiring disposal. IFNEC envisages the development of comprehensive fuel services, including such options as fuel leasing, to begin addressing the challenges of reliable fuel supply while maximizing non-proliferation benefits. The establishment of comprehensive and reliable fuel services, including used fuel disposition options, will create a more practical approach to nuclear power for nations seeking its benefits without the need to establish indigenous fuel cycle facilities. It is through enabling such a comprehensive framework that IFNEC will possibly make its primary contribution to reducing proliferation risk.

#### The plan would cause quick U.S.-Russia PRISM commercialization and fissile material oversight.

Tom Blees, 6-4-2011, is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate,”Disposal of UK plutonium stocks with a climate change focus,” <http://bravenewclimate.com/2011/06/04/uk-pu-cc/>

While the scientists and engineers were perfecting the many revolutionary features of the IFR at the EBR-II site in the Eighties and early Nineties, a consortium of major American firms collaborated with them to design a commercial-scale fast reactor based on that research. General Electric led that group, which included companies like Bechtel, Raytheon and Westinghouse, among others. The result was a modular reactor design intended for mass production in factories, called the PRISM (Power Reactor Innovative Small Module). A later iteration, the S-PRISM, would be slightly larger at about 300 MWe, while still retaining the features of the somewhat smaller PRISM. For purposes of simplicity I will refer hereinafter to the S-PRISM as simply the PRISM. After the closure of the IFR project, GE continued to refine the PRISM design and is in a position to pursue the building of these advanced reactors as soon as the necessary political will can be found. Unfortunately for those who would like to see America’s fast reactor be built in America, nuclear politics in the USA is nearly as dysfunctional as it is in Germany. The incident at Fukushima has only made matters worse. The suggestion in this report that fast reactors are thirty years away is far from accurate. GE-Hitachi plans to submit the PRISM design to the Nuclear Regulatory Commission (NRC) next year for certification. But that time-consuming process, while certainly not taking thirty years, may well be in process even as the first PRISM is built in another country. This is far from unprecedented. In the early Nineties, GE submitted its Advanced Boiling Water Reactor (ABWR) design to the NRC for certification. GE then approached Toshiba and Hitachi and arranged for each of those companies to build one in Japan. Those two companies proceeded to get the design approved by their own NRC counterpart, built the first two ABWRs in just 36 and 39 months, fueled and tested them, then operated them for a year before the NRC in the US finally certified the design. International partners On March 24th an event was held at the Russian embassy in Washington, D.C., attended by a small number of members of the nuclear industry and its regulatory agencies, both foreign and domestic, as well as representatives of NGOs concerned with nuclear issues. Sergei Kirienko, the director-general of Rosatom, Russia’s nuclear power agency, was joined by Dan Poneman, the deputy secretary of the U.S. Dept. of Energy. This was shortly after the Fukushima earthquake and tsunami, at a time when the nuclear power reactors at Fukushima Daiichi were still in a very uncertain condition. Mr. Kirienko and Mr. Poneman first spoke about the ways in which the USA and Russia have been cooperating in tightening control over fissile material around the world. Then Mr. Kirienko addressed what was on the minds of all of us: the situation in Japan and what that portends for nuclear power deployment in the USA and around the world. He rightly pointed out that the Chernobyl accident almost exactly 25 years ago, and the Fukushima problems now, clearly demonstrate that nuclear power transcends national boundaries, for any major accident can quickly become an international problem. For this reason Kirienko proposed that an international body be organized that would oversee nuclear power development around the world, not just in terms of monitoring fissile material for purposes of preventing proliferation (much as the IAEA does today), but to bring international expertise and oversight to bear on the construction and operation of nuclear power plants as these systems begin to be built in ever more countries. Kirienko also pointed out that the power plants at risk in Japan were old reactor designs. He said that this accident demonstrates the need to move nuclear power into the modern age. For this reason, he said, Russia is committed to the rapid development and deployment of metal-fueled fast neutron reactor systems. His ensuing remarks specifically reiterated not only a fast reactor program (where he might have been expected to speak about Gen III or III+ light water reactor systems), but the development of metal fuel for these systems. This is precisely the technology that was developed at Argonne National Laboratory with the Integral Fast Reactor (IFR) program, but then prematurely terminated in 1994 in its final stages. For the past two years I’ve been working with Dr. Evgeny Velikhov (director of Russia’s Kurchatov Institute and probably Russia’s leading scientist/political advisor) to develop a partnership between the USA and Russia to build metal-fueled fast reactors; or to be more precise, to facilitate a cooperative effort between GE-Hitachi and Rosatom to build the first PRISM reactor in Russia as soon as possible. During those two years there have been several meetings in Washington to put the pieces in place for such a bilateral agreement. The Obama administration, at several levels, seems to be willingly participating in and even encouraging this effort. Dr Evgeny Velikhov, SCGI member Dr. Velikhov and I (and other members of the Science Council for Global Initiatives) have also been discussing the idea of including nuclear engineers from other countries in this project, countries which have expressed a desire to obtain or develop this technology, some of which have active R&D programs underway (India, South Korea, China). Japan was very interested in this technology during the years of the IFR project, and although their fast reactor development is currently focused on their oxide-fueled Monju reactor there is little doubt that they would jump at the chance to participate in this project. Dr. Velikhov has long been an advocate of international cooperation in advanced nuclear power research, having launched the ITER project about a quarter-century ago. He fully comprehends the impact that international standardization and deployment of IFR-type reactors would have on the well-being of humanity at large. Yet if Russia and the USA were to embark upon a project to build the first PRISM reactor(s) in Russia, one might presume that the Russians would prefer to make it a bilateral project that would put them at the cutting edge of this technology and open up golden opportunities to develop an industry to export it. It was thus somewhat surprising when Mr. Kirienko, in response to a question from one of the attendees, said that Russia would be open to inviting Japan, South Korea and India to participate in the project. One might well question whether his failure to include China in this statement was merely an oversight or whether that nation’s notorious reputation for economic competition often based on reverse-engineering new technologies was the reason. I took the opportunity, in the short Q&A session, to point out to Mr. Poneman that the Science Council for Global Initiatives includes not just Dr. Velikhov but most of the main players in the development of the IFR, and that our organization would be happy to act as a coordinating body to assure that our Russian friends will have the benefit of our most experienced scientists in the pursuit of this project. Mr. Poneman expressed his gratitude for this information and assured the audience that the USA would certainly want to make sure that our Russian colleagues had access to our best and brightest specialists in this field. Enter the United Kingdom Sergei Kirienko was very clear in his emphasis on rapid construction and deployment of fast reactors. If the United States moves ahead with supporting a GE-Rosatom partnership, the first PRISM reactor could well be built within the space of the next five years. The estimated cost of the project will be in the range of three to four billion dollars (USD), since it will be the first of its kind. The more international partners share in this project, the less will be the cost for each, of course. And future copies of the PRISM have been estimated by GE-Hitachi to cost in the range of $1,700/kW. Work is under way on gram samples of civil plutonium According to this consultation document, the UK is looking at spending £5-6 billion or more in dealing with its plutonium. Yet if the plutonium were to simply be secured as it currently is for a short time longer and the UK involved itself in the USA/Russia project, the cost would be a small fraction of that amount, and when the project is completed the UK will have the technology in hand to begin mass-production of PRISM reactors. The plutonium stocks of the UK could be converted into metal fuel using the pyroprocessing techniques developed by the IFR project (and which, as noted above, are ready to be utilized by South Korea). The Science Council for Global Initiatives is currently working on arranging for the building of the first commercial-scale facility in the USA for conversion of spent LWR fuel into metal fuel for fast reactors. By the time the first PRISM is finished in Russia, that project will also likely be complete. What this would mean for the UK would be that its stores of plutonium would become the fast reactor fuel envisioned by earlier policymakers. After a couple years in the reactor the spent fuel would be ready for recycling via pyroprocessing, then either stored for future use or used to start up even more PRISM reactors. In this way not only would the plutonium be used up but the UK would painlessly transition to fast reactors, obviating any need for future mining or enrichment of uranium for centuries, since once the plutonium is used up the current inventories of depleted uranium could be used as fuel. Conclusion Far from being decades away, a fully-developed fast reactor design is ready to be built. While I’m quite certain that GE-Hitachi would be happy to sell a PRISM to the UK, the cost and risk could be reduced to an absolute minimum by the happy expedient of joining in the international project with the USA, Russia, and whichever other nations are ultimately involved. The Science Council for Global Initiatives will continue to play a role in this project and would be happy to engage the UK government in initial discussions to further explore this possibility. There is little doubt that Russia will move forward with fast reactor construction and deployment in the very near future, even if the PRISM project runs into an unforeseen roadblock. It would be in the best interests of all of us to cooperate in this effort. Not only will the deployment of a standardized modular fast reactor design facilitate the disposition of plutonium that is currently the driving force for the UK, but it would enable every nation on the planet to avail itself of virtually unlimited clean energy. Such an international cooperative effort would also provide the rationale for the sort of multinational nuclear power oversight agency envisioned by Mr. Kirienko and others who are concerned not only about providing abundant energy but also in maintaining control over fissile materials.

#### Russian nuclear security is a joke spent nuclear fuel is highly vulnerable to terrorist theft – cited means and motivation.

Stephen Menesick, Summer 2011, Political Science and Peace, War and Defense, public policy analysis, Unviersity of Chapel Hill, Global Security Studies, Vol. 2 Issue 3, “ Preventing the Unthinkable: An Overview of Threats, Risks, and US Policy Response to Nuclear Terrorism,” p. 5-6, <http://globalsecuritystudies.com/Menesick%20Nuclear%20Final.pdf>

The outlook in Russia is bleaker. After the Cold War, many Russian nuclear weapons were extremely vulnerable—left nearly unsecured across the country. Since then, the Russian government has made a considerable effort to strengthen security and upgrade technology that guards nuclear weapons and material (Bunn, 2006). However, significant risks still remain. Because of the sheer quantity of weapons in Russia, and the difficulty of managing such a large number of weapons, external risks of outright theft are always a concern. Reports by Russian officials have confirmed that terrorists have conducted intelligence gathering operations on Russian stockpiles, and to date, it is the only country where documentation of terrorist surveillance exists (Bunn 2010, 35). Equipping all sites with state of the art security measures has been a difficult challenge. The Russian government, and consequently the security contractors who are responsible for the upkeep of these facilities, suffers from a lack of financial resources (Joyner & Parkhouse 2009, 215). Additionally, significant internal threats are present. Because the government employs independent security companies to coordinate much of management of nuclear materials, there are two channels for insiders to aid terrorist groups—high level government officials and low level technical personnel. Both groups have incentive to divulge information at the right price, and Russia has a political environment that has been rife with corruption for decades (Bunn 2010, 32-33 and Joyner & Parkhouse 2009, 216). Finally, there is the security risk of Highly Enriched Uranium-fueled reactors (HEU’s). Because of its chemical composition and refinement, HEU can be used easily to make crude nuclear weapons even by non-experts (Norwegian Project Secretariat). Because of the ease with which a weapon can be made out of HEU, it is easy to see why terrorist acquisition is a direct security risk. As of 2009, about half of the 200 remaining reactors were still using HEU fuel, and do not have capability to be converted to lower enriched uranium (LEU) (World Nuclear Association 2011). Most of these are in Russia, where the government has invested little in research to convert their own reactors to LEU power or other alternatives (World Nuclear Association 2011). Further, and most alarming, is that the security at many of these HEU sites is inadequate to prevent theft of HEU, making research reactors a prime target for terrorists seeking to obtain nuclear material (Bunn, 2010, 45). If a terrorist group only acquires nuclear material, and not a functional weapon, they will have to successfully create a weapon that they can detonate. Unfortunately, this is an achievable end that can be done with little resources or expertise. As discussed above, Highly Enriched Uranium is pure enough that it can be made into a devastating weapon relatively easily, and it is also the most likely nuclear material that terrorists would get their hands on. The perception of modern nuclear weapons may be that they are highly technical instruments of warfare backed by complex science. While this may be true, a “crude” nuclear weapon, one that takes little skill to create, would still be incredibly deadly—capable of destroying the downtown of a major city (Bunn, 2010, 16). The process of building a weapon of this type is not entirely simple, and anyone who wanted to construct such a device would need a technical team with at least some experience. However, in comparison to the nuclear weapons manufactured today, a crude bomb would be a more feasible project, as it would not have to comply with rigorous military and safety specifications. Thus, it is plausible to see that this kind of power is not out of reach for dedicated terrorist groups, should they acquire nuclear material (Ferguson & Potter 2003, 116). Having acquired nuclear material and created a weapon, the final obstacle a terrorist group would need to pass would be delivery and detonation in the target location. Likely, this would involve them smuggling a bomb or device into the United States, and then into a major city, undetected. Nuclear material is quite difficult to track, especially the small amounts that would be needed for a crude weapon (Bunn 2010, 18). Journalists have repeatedly demonstrated the ease with which radioactive materials can be transported and shielded from detection while traveling (Ferguson & Potter 2003, 141). Even with the most advanced technology, HEU is among the most difficult kind of radiological material to detect (Montgomery 2009, 79). Also, terrorists could use existing port and transport systems in place, as they are relatively unsecure. Customs and Border Patrol inspects only around 6% of cargo containers entering the US (Medalia 2005). Even with increased security measures and Port Authority reorganization in 2003, there are still plausible scenarios for terrorist groups sneaking radioactive materials into the US via boat undetected (Ferguson & Potter 2003, 300). Furthermore, terrorists could avoid this obstacle entirely by taking materials that were already inside the US. Once inside the US, delivery and detonation to target site would also not be insurmountable. As Matthew Bunn and E. P. Maslin write: The length of national borders, the diversity of means of transport, the vast scale of legitimate traffic across borders, and the ease of shielding the radiation from plutonium or especially from HEU all operate in favor of the terrorists. Building the overall system of legal infrastructure, intelligence, law enforcement, border and customs forces, and radiation detectors needed to find and recover stolen nuclear weapons or materials, or to interdict these as they crossnational borders, is an extraordinarily difficult challenge. (Bun & Maslin 2010) In order for a terrorist group to be “successful” in carrying out a nuclear attack, many elements must come together. There is no doubt that the end result of a nuclear terrorist attack would be terrible, so even with a low probability of attack, the high impact possibility means steps should still be taken to prevent it. In each link of the chain of attack, there are security measures that have been put in place, and continue to be upgraded. However, as discussed above, there are still vulnerabilities in each step of the process that, if they all were orchestrated together, terrorists could exploit to pull off an attack with a nuclear weapon. The most critical of these links is acquisition of a bomb or nuclear material, because it is the only one that truly prevents an attack from occurring. Once a terrorist group has nuclear material, they can find people willing to make it into a usable weapon if they cannot themselves.

#### Causes retaliation and global nuclear war – only the plan solves.

Patrick F. Speice, Jr., Feburary 2006, is an associate in Gibson, Dunn & Crutcher's Washington, D.C. office, works in the firm’s International Trade Regulation and Compliance Department, focusing on export controls, foreign regulations, and economic sanctions, earned his J.D. in 2006 from the Marshall-Wythe School of Law at the College of William & Mary, William and Mary Research Fellowpolitical science, Wake Forest University, authored or co-authored professional articles, includes representation of clients in Foreign Corrupt Practices matters and securities investigations, “Negligence and Nuclear Nonproliferation,” William & Mary Law Review, Lexis Nexis

Accordingly, there is a significant and ever-present risk that terrorists could acquire a nuclear device or fissile material from Russia as a result of the confluence of Russian economic decline and the end of stringent Soviet-era nuclear security measures. 39 Terrorist groups could acquire a nuclear weapon by a number of methods, including "steal[ing] one intact from the stockpile of a country possessing such weapons, or ... [being] sold or given one by [\*1438] such a country, or [buying or stealing] one from another subnational group that had obtained it in one of these ways." 40 Equally threatening, however, is the risk that terrorists will steal or purchase fissile material and construct a nuclear device on their own. Very little material is necessary to construct a highly destructive nuclear weapon. 41 Although nuclear devices are extraordinarily complex, the technical barriers to constructing a workable weapon are not significant. 42 Moreover, the sheer number of methods that could be used to deliver a nuclear device into the United States makes it incredibly likely that terrorists could successfully employ a nuclear weapon once it was built. 43 Accordingly, supply-side controls that are aimed at preventing terrorists from acquiring nuclear material in the first place are the most effective means of countering the risk of nuclear terrorism. 44 Moreover, the end of the Cold War eliminated the rationale for maintaining a large military-industrial complex in Russia, and the nuclear cities were closed. 45 This resulted in at least 35,000 nuclear scientists becoming unemployed in an economy that was collapsing. 46 Although the economy has stabilized somewhat, there [\*1439] are still at least 20,000 former scientists who are unemployed or underpaid and who are too young to retire, 47 raising the chilling prospect that these scientists will be tempted to sell their nuclear knowledge, or steal nuclear material to sell, to states or terrorist organizations with nuclear ambitions. 48 The potential consequences of the unchecked spread of nuclear knowledge and material to terrorist groups that seek to cause mass destruction in the United States are truly horrifying. A terrorist attack with a nuclear weapon would be devastating in terms of immediate human and economic losses. 49 Moreover, there would be immense political pressure in the United States to discover the perpetrators and retaliate with nuclear weapons, massively increasing the number of casualties and potentially triggering a full-scale nuclear conflict. 50 In addition to the threat posed by terrorists, leakage of nuclear knowledge and material from Russia will reduce the barriers that states with nuclear ambitions face and may trigger widespread proliferation of nuclear weapons. 51 This proliferation will increase the risk of nuclear attacks against the United States [\*1440] or its allies by hostile states, 52 as well as increase the likelihood that regional conflicts will draw in the United States and escalate to the use of nuclear weapons. 53

#### By itself terrorism causes extinction.

Owen B. Toon, 4-19-2007, is professor of Atmospheric and Oceanic Sciences and a fellow at the Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado received his Ph.D. from Cornell University, in cloud physics, atmospheric chemistry and radiative transfer, “Atmospheric effects and societal consequences of regional scale nuclear conﬂicts and acts of individual nuclear terrorism,” Atmosphere Chemistry Physics

To an increasing extent, people are congregating in the world’s great urban centers, creating megacities with popula- tions exceeding 10 million individuals. At the same time, ad- vanced technology has designed nuclear explosives of such small size they can be easily transported in a car, small plane or boat to the heart of a city. We demonstrate here that a sin- gle detonation in the 15 kiloton range can produce urban fa- talities approaching one million in some cases, and casualties exceeding one million. Thousands of small weapons still ex- ist in the arsenals of the U.S. and Russia, and there are at least six other countries with substantial nuclear weapons invento- ries. In all, thirty-three countries control sufficient amounts of highly enriched uranium or plutonium to assemble nuclear explosives. A conflict between any of these countries involv- ing 50-100 weapons with yields of 15kt has the potential to create fatalities rivaling those of the Second World War. Moreover, even a single surface nuclear explosion, or an air burst in rainy conditions, in a city center is likely to cause the entire metropolitan area to be abandoned at least for decades owing to infrastructure damage and radioactive contamina- tion. As the aftermath of hurricane Katrina in Louisiana sug- gests, the economic consequences of even a localized nuclear catastrophe would most likely have severe national and inter- national economic consequences. Striking effects result even from relatively small nuclear attacks because low yield det- onations are most effective against city centers where busi- ness and social activity as well as population are concen- trated. Rogue nations and terrorists would be most likely to strike there. Accordingly, an organized attack on the www.atmos-chem-phys.net/7/1973/2007/ Atmos. Chem. Phys., 7, 1973–2002, 2007 Page 28 2000 O. B. Toon et al.: Consequences of regional scale nuclear conflicts U.S. by a small nuclear state, or terrorists supported by such a state, could generate casualties comparable to those once predicted for a full-scale nuclear “counterforce” exchange in a superpower conflict. Remarkably, the estimated quantities of smoke generated by attacks totaling about one megaton of nuclear explosives could lead to significant global climate perturbations (Robock et al., 2007). While we did not ex- tend our casualty and damage predictions to include poten- tial medical, social or economic impacts following the initial explosions, such analyses have been performed in the past for large-scale nuclear war scenarios (Harwell and Hutchin- son, 1985). Such a study should be carried out as well for the present scenarios and physical outcomes.

### Advantage 2 is Uranium

#### U.S. is completely dependent on foreign uranium now - our traditional domestic sources will run out by 2013.

Tommy Humphreys, 9-12-2012, editor of Business Insider, CEO of CEO.ca, “The US Is More Dependent On Foreign Uranium Than Foreign Oil”, Business Insider, http://www.businessinsider.com/the-us-is-more-dependent-on-foreign-uranium-than-foreign-oil-2012-9

Recently we sat down with Amir Adnani, CEO of Uranium Energy Corp. ($UEC), an American uranium mining company, for a conversation on the nuclear industry eighteen months after the catastrophe at Fukushima which devastated both Japan and most uranium miners’ share prices. One of the most critical issues we discussed in our interview was the severity of the US uranium supply and demand deficit. According to Adnani, “The US is consuming 55 million pounds of uranium per annum…to generate 20% of US electricity…[but] domestic production of uranium is only 4 million pounds per year…The US is more dependent on foreign uranium than it is on foreign oil.”Adnani says the supply deficit is global: “The world consumes…more uranium than the mining industry produces. In terms of real numbers, there’s global demand of about 180 million pounds per year, and supply from mining activity is roughly 140 million pounds per year–so you have a 40 million pound per year supply deficit, just to meet current reactor requirements.” How is that 40 million pound annual gap filled? The answer is retired Russian warheads. “Since the cold war ended,” Adnani continues, “we’ve relied heavily on military inventories of uranium–basically dismantling retired Russian nuclear warheads to feed this supply imbalance. This has taken place under a treaty called, “The Highly Enriched Uranium Treaty”, or the “HEU Treaty”, which is set to expire next year, in 2013. [Additionally], the Russian government has come out repeatedly, saying that after this agreement [expires] there’s no interest on their part to continue utilizing this source of supply…That’s a very important catalyst for recognizing why higher uranium prices are needed–in order to stimulate interest in new mine construction…to fill this secondary supply source.” When looking at future demand Adnani concludes: “There are roughly 430 nuclear reactors operating worldwide…over 60 [new reactors] in construction…and hundreds more planned between now and 2020-2030…What’s happening right now in the world in terms of new nuclear builds is unprecedented.”

#### HEU supply agreements collapsing ensures massive price spike increases.

Melissa Pistilli, 9-27-2012, Uranium Investment News (UIN), “Nuclear Power’s Critical Role in World Energy Mix Will Boost Uranium Demand,” <http://uraniuminvestingnews.com/12660/nuclear-power-uranium-demand-price-merger-acquisition.html>

Uranium set to rebound the world consumes nearly 180 million pounds of uranium annually, yet production only totals about 140 million pounds. Secondary supplies from the highly-enriched uranium agreement (HEU) with Russia is set to expire next year, which, said Handwerger, has yet to be factored into uranium share prices. Sadowski has said the end of the HEU agreement will remove about 13 percent of global annual supply. Raymond James is forecasting a three-year supply shortfall beginning in 2014, with prices climbing past $70/lb in 2014 to average about that in the long term. Morgan Stanley sees prices starting to rebound in 2014 on a supply deficit to average $69.50/lb in 2020.Notable improvements in the share prices of uranium stocks signal the beginning of a turn in the uranium sector, Handwerger believes. “Risk-on appetite is growing. Supply/demand fundamentals are healthy. Cameco (TSX:CCO,NYSE:CCJ) and Paladin shares, among others, are rebounding and beginning to move above the 200-day moving average, a key psychological level, for the first time in many months.” He also pointed out that several uranium stocks have had huge volume days recently, including Denison Mines (TSX: DML, AMEX:DNN) and Uranerz Energy (TSX:URZ,AMEX:URZ). “Uranium investors are beginning to sense that the uranium price is bottoming and that uranium miners are on the verge of a potential upswing. As we’ve seen in the past, when this sector turns it does so aggressively.” M&A activity likely to increase Most in the industry say spot prices must reach around $70/lb to make the majority of uranium projects economical. The general consensus is that spot prices will probably sit low for at least the next year or so since major utilities are covered for supplies in the short term. Given that environment, it will be hard for some juniors to weather the storm. Handwerger told Uranium Investing News that investors can expect to see a lot more merger and acquisition (M&A) activity in the coming months and years. “There are so many juniors out there with ridiculously low valuations — they’re sitting at a huge discount,” he said. Besides Cameco, which has admitted it is hungry for acquisitions, other majors in the uranium space that no doubt have an eye out for possible takeover targets include Uranium One (TSX:UUU), AREVA (EPA:AREVA) and Rio Tinto (NYSE:RIO,ASX:RIO,LSE:RIO). Handwerger believes that companies in Europe and the Americas that are close to production will be the most favored.

#### New production won’t be able to scale up.

Alka Singh, 9-13-2012, “Uranium Fundamentals Are at a Tipping Point,” http://seekingalpha.com/article/866571-uranium-fundamentals-are-at-a-tipping-point-alka-singh

Uranium prices may be down, but so are supplies. Demand for the heavy metal is rising fast, says Independent Researcher Alka Singh of Mine2Capital. In an exclusive interview with The Energy Report, Singh notes that, with the flow of enriched uranium from Russia drying up, the pressure is on for the mining industry to produce millions more pounds of yellow cake each year. The Energy Report: Alka, how robust is the global supply of uranium fuel? Alka Singh: There are 433 currently operating nuclear power reactors around the world. Annually, they consume 177 million pounds [Mlb] of uranium. The world does not produce that much yellow cake. Last year, production was 130 Mlb. The gap is currently being filled largely by the Highly Enriched Uranium Agreement [HEU] with Russia and by other sources. As we approach the 2013 HEU Agreement expiry date, the supply/demand fundamentals will prove positive for uranium prices, and that will boost the price of uranium equities. TER: Who has the pricing power in this market? AS: When electrical power utilities buy uranium through long-term contracts, the agreements run as long as 8-10 years. That's why utilities have pricing power. The challenge now is that spot uranium prices are at $48/lb. But for many mines, the cost of production is $50-60/lb. The utilities have an enormous amount of power when it comes to determining the price of yellow cake. They are happy to sit on the sidelines and jump in to buy supply at basement prices. When spot prices compare favorably to the long-term prices, the utilities will buy supply from the short-term market. But, over time, the long-term prices determine where the market is heading. TER: Globally, do state-owned energy utilities have a competitive advantage over the private utilities when it comes to obtaining uranium? AS: Yes. Since state-owned utilities receive government backing for resources and loan guarantees, it's always easier for the public enterprises to be more successful. But, that is more so in developing countries, such as South Africa, than in the developed countries. TER: How significant is military demand for uranium globally versus demand from electrical utilities? AS: Most of the demand comes from the civilian nuclear reactors rather than military need. Some military applications require enriched uranium, but they compose a very small percentage of market demand. TER: How can the HEU Agreement supply gap be filled? AS: That's the question that every uranium investor should be considering. The HEU Agreement annually supplies about 24 Mlb of uranium. The uranium producers are having difficulty in scaling up production to fill the looming gap. For example, BHP Billiton Ltd. (BHP) recently announced a decision to delay expansion at Olympic Dam by at least a couple of years. The initial expected expansions would have brought production up to about 20 Mlb from about 9 Mlb. Kazakhstan is the world's largest uranium producer, followed by Canada and Australia. However, at the current market prices, production in these regions cannot increase a lot. The supply/demand fundamentals for uranium are looking good, because the long-term prices and the spot prices will have to increase to catalyze enough production to meet demand. Foreseeable events are priced into stocks, before the events actually occur. The HEU Agreement is slated to expire late in 2013, so by late 2012, uranium equities and prices should be discounting the market's loss of 24 Mlb. Obviously, there will be some increase in production from Kazakhstan and Australia and Canada. But that is not likely to fill the expanding gap. The U.S. has 104 operating nuclear power reactors out of the 433 reactors in the world. But last year, the U.S. produced less than 4 Mlb of uranium while consuming 55 Mlb.

#### Uranium dependency is extremely fragile - very few producers and security of supply chains.

Carin Hall, 3-20-2012, “The Push for Uranium Mining and Nuclear Power,” Energy Digital, http://www.energydigital.com/global\_mining/the-push-for-uranium-mining-and-nuclear-power

Geopolitically speaking, it will strengthen the security of supply. As of today, almost half of the US's entire supply of uranium comes from Russia's dismantled warheads while the rest comes from a number of international players and few domestic producers. “Having more domestic resources of any fuel, particularly uranium, is important, and that's why it's strategic to be a domestic producer when there's so few of us,” says Adnani. In light of what's going on in the Strait of Hormuz, where 15-20 percent of the US's oil supply chain is at risk for interruption, energy security is one of the most critical issues on the table today. Should something happen to disrupt the supply chain of uranium, the risk is even greater. “There's more dependency on foreign uranium than there is on foreign oil,” says Adnani. “With about 60 percent or more of all uranium in the world coming from just five mines, the supply chain is extremely limited and fragile.”

#### Import dependency on uranium exposes the U.S. to price fluctuations for uranium.

Fletcher T. Newton, 3-12-2008, executive vice president, “Hardrock Mining: Issues Relating to Abandoned Mine Lands and Uranium Mining,” Testimony for the Energy and Natural Resources Committee for the U.S. Senate, http://www.energy.senate.gov/public/index.cfm/files/serve?File\_id=a4b7ff46-ecef-d36b-0168-edee05d05aeb

Despite reserves of 78 important mined minerals, the United States currently attracts only eight percent of worldwide exploration dollars. As a result, our nation is becoming more dependent upon foreign sources to meet our country’s strategic and critical metals and minerals requirements, even for minerals with adequate domestic resources. The 2007 U.S. Geological Survey Minerals Commodity 6 Summaries reported that America now depends on imports from other countries for 100 percent of 17 mineral commodities and for more than 50 percent of 45 mineral commodities. This increased import dependency is not in our national interest particularly for commodities critical to pending strategic programs such as reducing greenhouse gas emissions or undertaking energy efficiency efforts. Increased import dependency causes a multitude of negative consequences, including aggravation of the U.S. balance of payments, unpredictable price fluctuations, and vulnerability to possible supply disruptions due to political or military instability. Our over-reliance on foreign supplies is exacerbated by competition from the surging economies of countries such as China and India. As these countries continue to evolve and emerge into the global economy, their consumption rates for mineral resources are ever-increasing; they are growing their economies by employing the same mineral resources that we used to build and maintain our economy. As a result, there exists a much more competitive market for global mineral resources. Even now, some mineral resources that we need in our daily lives are no longer as readily available to the United States. Uranium is an excellent example of a mineral that the US relies on foreign sources. The United States currently consumes about 56 million pounds of uranium each year, yet we only produce 4 and a half million pounds. We have the world’s largest fleet of reactors (now 104), which operate at the world’s highest average capacity factor and produce 20% of our country’s electricity. In fact, America’s nuclear reactors now produce more electricity than ever before. And we have one of the world’s largest resource bases of uranium of any country in the world.

#### Reprocessing re-adjusts prices - recovers fuel price spikes.

Stephen Berry & George S. Tolley, 11-29-2010, James Franck Distinguished Service Professor Emeritus at the University of Chicago, Fellow, American Academy of Arts and Sciences, foreign Member, Royal Danish Academy of Sciences, member and Home Secretary, National Academy of Sciences, J. Heyrovsky Honorary Medal for Merit in the Chemical Sciences, Academy of Sciences of the Czech Republic, Alexander von Humboldt-Stiftung Senior Scientist Award, Phi Beta Kappa National Lecturer, George S. Tolley is a professor emeritus in Economics at the University of Chicago, fellow, American Association for the Advancement of Science, honorary editor, Resource and Energy Economics, honorary Ph.D., North Carolina State University, “Nuclear Fuel Reprocessing Future Prospects and Viability,” p. 32-3, <http://humanities.uchicago.edu/orgs/institute/bigproblems/Team7-1210.pdf>

Reprocessing decreases the amount of nuclear waste that needs to be stored, so the main benefit of reprocessing is the amount of storage saved from reprocessing fuel. Bunn estimated that overall repository costs are decreased by around 50% with reprocessing; repository costs of $400/kgHM for the nuclear fuel cycle will only be $200/kgHM for reprocessed high-level waste. A reprocessing facility with 900 tHM/yr capacity will therefore save $180 million in annual disposal costs. In total, over $35,407 million has been paid into the national Nuclear Waste Fund up until November 2010.90 Uranium prices have also been rising due to increased demand, a trend that may have long-term repercussions. Identified uranium deposits can fuel existing nuclear plants for about 80 years without reprocessing. Reprocessing can extend the life of current uranium resources for an additional 15 to 20 years.91 Total conventional uranium resources, including undiscovered deposits that are estimated using indirect geological evidence and extrapolated values, can fuel existing plants for around 200 years.92 In the short-term, however, prices have risen sharply because of an announced increase in nuclear plants that will require fuel: China is intending to increase nuclear power as a source of national energy by 7% in the next ten years, and countries such as Russia, Pakistan, and South Korea are all building new reactors.93 Another benefit of reprocessing is the additional plutonium and uranium recovered per kilogram of spent fuel reprocessed; this amount replaces a portion of the raw material that goes into the fuel cycle. The amount of recovered uranium is .94 kg/kgHM, and the amount of recovered plutonium is .01014 kg/kgHM.

#### New nuclear technology has forced increases in mining – new supply veins won’t fill the shortage.

David Dutkewych, 1-13-2012, Insider Fortunes, “Why A Reckless Iran Could Push Uranium Prices Sky-High,” <http://insiderfortunes.com/2012/01/why-a-reckless-iran-could-push-uranium-prices-sky-high/>

This new demand will need to be met by additional mining efforts. Because the world’s appetite for energy is not going to slow down anytime soon. Chronic Shortages for Two-and-a-Half Decades For the last 25 plus years, the world’s consumption of uranium has been greater than its production. Reprocessed uranium and plutonium (from the dismantling of Russian and US nuclear weapons) has helped meet this shortfall. This key source of uranium could go away very quickly if Iran succeeds in developing a nuclear-threat capability. The western world would have to make sure it’s well supplied to protect itself from an Iranian attack. The World Nuclear Association (WNA) says that uranium mining will need to increase by almost 300% in the next two decades to meet future demand. This scenario may be a little bit of a stretch. The WNA is using their high-end forecast for uranium demand, which is possible but probably not likely. But I do believe that the mining supply of uranium will need to double from current levels to meet demand in 2030. This is still a very bullish outlook for uranium miners. The Asian economies, most notably China, will create the most demand for nuclear energy. And with that – demand for uranium. These developing countries are trying to diversify their energy resources from oil, gas, and coal by adding to their nuclear capacity. They have no choice if they are to meet their growing electrical demands. Just look at China. It’s currently building 26 nuclear facilities, and has plans to construct another 51 and has proposed another 120 more. China’s proposed reactors are 9% higher from WNA statistics released before the Japanese disaster last year. China is expected to surpass the US as the world’s largest consumer of uranium during the 2020s as its imports rise sharply to feed their growing nuclear industry. The National Energy Association in China expects that nuclear power by 2020 will be contributing 7%-8% of the nation’s electricity, which is higher than the government’s current target of 5%. I believe both estimates are low. As China’s energy needs rise, they will increasingly turn to nuclear energy to help meet electricity demand. Right now China can’t supply enough uranium to meet demand. This has forced China to import uranium from overseas. It is estimated that China is currently producing about 1,000 tons of uranium a year. And this is only about 50% of its current demand. A report from the International Atomic Energy Agency said China’s proven uranium deposits extend to about 100,000 tons. Which means, without the discovery of new untapped deposits, China’s uranium supply could be used up very quickly as China’s uranium demand is expected to reach 20,000 tons by 2020. China’s not the only country with supply problems. The supply situation is tight worldwide. The global mined uranium supply was 53,663 tons in 2010, according to the WNA. That’s not nearly enough to cover global demand. Only about 75% of uranium demand is being met with current mining. The uranium-mining deficit will not be met by the supplemental supplies for long. The agreement between the US and Russia is scheduled to end in 2013. If the agreement is renewed, there is still a limited supply of Cold War-era nuclear weapons and eventually this significant source of uranium will disappear.

#### PRISMs stop uranium shortages and new mining through use of existing spent fuel supplies - a flux of fast neutrons is the only way to use up all the energy potential.

Charles Archambeau et. al, 2-1-2011, is currently President of Technology Research Associates corporation, consultant to the Departmant of Energy for seismic effects associated with geothermal energy production, consultant involved in the technical evaluation of the proposed high level nuclear waste repository at Yucca, board of directors for a number of U.S. and Canadian companies and has been active in their business management and scientific programs, Natural Resources Defense Council of the U.S., Randolph Ware, Sr. Research Associate at CIRES Visiting Scientist at NCAR, Founder, Chief Scientist at Radiometrics, Congressional Science Fellow at Office of Technology Assessment, Research Associate at Cooperative Institute for Research in the Environmental Sciences, Post Doctorate at Joint Institute for Laboratory Astrophysics, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, Yoon Chang, Argonne National Laboratory, General Manager of the Integral Fast Reactor Program, Associate Laboratory Director for Engineering Research, Interim Laboratory Director, serves as the Chair of IAEA’s Technical Working Group on Nuclear Fuel Cycle Options and Spent Fuel Management, Jerry Peterson is a professor of physics at the University of Colorado and a Jefferson Science Fellow for the U.S. Department of State, Robert Serafin was the director of the National Center for Atmospheric Research (NCAR), and past president of the AMS, Tom Wigley is a senior scientist in the Climate and Global Dynamics Division of the US National Center for Atmospheric Research and former Director of the CRU, an adjunct Professor at the University of Adelaide, “IFR: An optimized approach to meeting global energy needs (Part I),” <http://bravenewclimate.com/2011/02/01/ifr-optimized-source-for-global-energy-needs-part-i/>

Fossil fuels currently supply about 80% of humankind’s primary energy. Given the imperatives of climate change, pollution, energy security and dwindling supplies, and enormous technical, logistical and economic challenges of scaling up coal or gas power plants with carbon capture and storage to sequester all that carbon, we are faced with the necessity of a nearly complete transformation of the world’s energy systems. Objective analyses of the inherent constraints on wind, solar, and other less-mature renewable energy technologies inevitably demonstrate that they will fall far short of meeting today’s energy demands, let alone the certain increased demands of the future. Nuclear power, however, is capable of providing all the carbon-free energy that mankind requires, although the prospect of such a massive deployment raises questions of uranium shortages, increased energy and environmental impacts from mining and fuel enrichment, and so on. These potential roadblocks can all be dispensed with, however, through the use of fast neutron reactors and fuel recycling. The Integral Fast Reactor (IFR), developed at U.S. national laboratories in the latter years of the last century, can economically and cleanly supply all the energy the world needs without any further mining or enrichment of uranium. Instead of utilizing a mere 0.6% of the potential energy in uranium, IFRs capture all of it. Capable of utilizing troublesome waste products already at hand, IFRs can solve the thorny spent fuel problem while powering the planet with carbon-free energy for nearly a millennium before any more uranium mining would even have to be considered. Designed from the outset for unparalleled safety and proliferation resistance, with all major features proven out at the engineering scale, this technology is unrivaled in its ability to solve the most difficult energy problems facing humanity in the 21st century.

#### That will trigger a global war over access to uranium - escalates to nuclear use.

Mihail Konstantiov, 2-11-2012, Professor of Mathematics with the University of Architecture, Civil Engineering and Geodesy (UACEG), Bulgaria, Vice-Chancellor of UACEG, Member of scientific councils and commissions, Member of the Board of IICREST, authored 30 books and over 500 scientific papers. He has participated in international scientific projects of EU and NATO and realized research and lecturing visits in British, German and French universities, been Member and Vice Chair of the Central Election Commission of Bulgaria and Voting coordinator of OSCE as well as the Bulgarian representative at the Council of Europe on electronic voting, in addition to his scientific publications, he has authored more than 300 articles in Bulgarian editions devoted to social and political issues with emphasis on election practice and legislation., “Uranium time bomb ticking,” Europost, http://www.europost.bg/article?id=3763

In 1945, the US had three nucle­ar bombs - two plu­to­ni­um-based devi­ces and a ura­ni­um-based one. The first one was det­o­nat­ed on a test site in New Mex­i­co, and the sec­ond and third ones over Jap­a­nese ter­ri­to­ry. On 6 August 1945, the then-only ura­ni­um-based bomb was thrown over the Jap­a­nese city of Hiro­shi­ma. What hap­pened is well known and I will not re-tell it. More­over, this sto­ry deals with nucle­ar weap­ons but they are not the main char­ac­ters. Almost 20 years ago, an agree­ment was inked under which the US under­took to help dis­man­tle Rus­sian nucle­ar war­heads and con­vert the ura­ni­um from them into fuel for nucle­ar reac­tors. The rea­son is sim­ple - the pro­ce­dure is expen­sive, Rus­sia was weak and poor at the time, and in addi­tion, Amer­i­can tech­nol­o­gy back then was sig­nif­i­cant­ly ahead of the Rus­sian one. The amounts of con­vert­ed ura­ni­um are mas­sive - more than 500 ton­nes. Thus Rus­sian ura­ni­um turns into fuel for US nucle­ar pow­er plants. At present, this fuel is used to pro­duce 10% of the elec­tri­cal pow­er in the US. This is more than the ener­gy pro­duced from renew­a­ble sour­ces, such as sun, wind and water, there. This idyll, how­e­ver, is com­ing to its end. First, the US-Rus­sia agree­ment for Rus­sian war­heads con­ver­sion expires next year and Rus­sia is high­ly unlike­ly to extend it. More­over, Rus­sians now have good tech­nol­o­gy for that pur­pose and will prob­a­bly want to leave their ura­ni­um for them­selves. And sec­ond, if the agree­ment is extend­ed, the amounts of war­heads sub­ject to dis­man­tling will soon be exhaust­ed any­way as the agreed lim­its are reached. Global mar­kets have already start­ed sus­pect­ing what is going to hap­pen with the expir­ing US-Rus­sia agree­ment for war­head ura­ni­um. And not only with it. Indeed, ura­ni­um oxide pri­ces have gone wild sur­ging to almost $70/lb (1lb is 454 gr.) in Jan­u­ary this year from $40/lb in Sep­tem­ber 2011. Such a 70% ral­ly in ura­ni­um price over just 3-4- months is not sus­tain­a­ble and even a cer­tain edg­ing down can be expect­ed. Still, the trend is clear - ura­ni­um dearth is loom­ing, as well as dearth of oth­er stra­te­gic nat­u­ral resour­ces. We have repeat­ed­ly stat­ed this but let us under­score it again. The glob­al cri­sis is most of all a resource cri­sis. It is finan­cial inso­far as it has become clear that the sys­tem allow­ing some peo­ple to print mon­ey while oth­ers work and bring them oil and oth­er goods will not last for good. The antic­i­pat­ed ura­ni­um short­age in the com­ing dec­ade is tru­ly strik­ing and is esti­mat­ed at 500m lb! One of the rea­sons is the fast devel­op­ing econ­o­mies of Chi­na and India, along with oth­er coun­tries like Bra­zil and Tur­key. It is where the bulk of the 147 reac­tors expect­ed to become oper­a­tion­al in these 10 years will be locat­ed. A major con­sum­er of ura­ni­um, the US cur­rent­ly has a demand for 60m lb a year but pro­du­ces only 3m lb. Still, this is the way things are at present. And what will hap­pen aft­er the US Nucle­ar Reg­u­la­to­ry Com­mis­sion reviews and poten­tial­ly approves new nucle­ar reac­tor pro­pos­als? They are 26 or so. And more are in the pipe­line. The sit­u­a­tion in India is even more dra­mat­ic - an increase in the share of nucle­ar ener­gy in elec­tric­i­ty pro­duc­tion is expect­ed from 2.5% at present to 25%. In oth­er words, India will need 10 times as much ura­ni­um as it does now if the far-reach­ing plan is put to prac­tice. Chi­na has more hum­ble aspi­ra­tions and is gear­ing to raise the share of nucle­ar facil­i­ties in elec­tric­i­ty pro­duc­tion only ...three times. And Chi­na, much like the US, does not have suf­fi­cient domes­tic sup­ply. We can con­tin­ue with sta­tis­tics, but things are evi­dent any­way. A war is around the cor­ner. In the best-case sce­nar­io, this will be a price war over ura­ni­um and in par­tic­u­lar ura­ni­um oxide. Pri­ces in the order of $100 or even $200/lb no longer seem far-fetched. Price lev­els of $500-$1000-$2000/lb have even been men­tioned and this will have its swift and dras­tic impli­ca­tions. Still, if a reac­tor costs $4bn, why not pay $1000/lb of ura­ni­um? Or else, the 4-bil­lion invest­ment will go down the drain. Anoth­er explod­ing glob­al mar­ket is the one for rare earth ele­ments with hard-to-pro­nounce Lat­in names such as Neo­dym­i­um, Ceri­um, Lan­tha­num, Gal­li­um, Gado­lin­i­um, Thu­li­um… If we have a look at Men­de­leev's peri­od­ic table, they are squeezed some­where at the bot­tom. But then, all the elec­tron­ics around us, all com­put­ers, fibre optics, all sat­el­lites and in gen­er­al every­thing under­ly­ing our high-tech civ­il­i­za­tion would be utter­ly impos­si­ble but for these exot­ic hard-to-extract ele­ments. The price of each of them has dou­bled and tri­pled in a year alone. And the pri­ces of some of them have soared six­fold in the same peri­od. Com­pared with rare earth ele­ments, gold and plat­i­num are like a tame kit­ten. It nat­u­ral­ly eats and swells but at a rate of only up to 40% a year. And what about the lith­i­um under­ly­ing the idea of elec­tric vehi­cles stag­ing a mass entrance into our dai­ly life and econ­o­my if and when oil is exhaust­ed? But it is in rare ele­ments where the secret of future skir­mish­es over resour­ces lies. Because across the world, they are real­ly hard to extract but Chi­na holds 97% of their glob­al pro­duc­tion! No mis­take, Chi­na pro­du­ces 33 times as much rare met­als as the rest of the world. This may as well be changed some day as cur­rent­ly huge efforts and mon­ey are put into look­ing for rare met­als around the globe. Hypo­thet­i­cal­ly, only a third of the res­erves is in Chi­na with the oth­er two thirds lying some­where else. Too bad it is any­one's guess where, although Cana­da, South Afri­ca and some Afri­can coun­tries are con­sid­ered prom­is­ing in this regard. Still, for the time being this is how things are: Chi­na has almost every­thing and the rest of the world hard­ly any­thing. Does any­one have any doubts why Chi­na has the ambi­tion to become the top dog? Of course, the world is by no means tread­ing water in one oth­er respect: sub­sti­tute tech­nol­o­gies are sought for that would not be so crit­i­cal­ly depend­ent on rare earth ele­ments, yet, more in the long rath­er than short run. By the way, why are we dis­cuss­ing ura­ni­um pri­ces along with all oth­er sorts of pri­ces in US dol­lars? The answer is clear: because the dol­lar is the glob­al reserve cur­ren­cy. The rea­son for this, though, is more com­pli­cat­ed. True, the US is the larg­est econ­o­my for the time being. But it is also among the most indebt­ed coun­tries in the world. And its debt is increas­ing­ly sur­ging. Still, this is not the most impor­tant. The most impor­tant thing is that the US has the most pow­er­ful, most mobile and one of the most effect­ive armies in the world. Lit­tle like­ly is it for some­one to reject the US dol­lar as a reserve cur­ren­cy while the 82nd Air­borne Divi­sion of the US Army, based at Fort Bragg North Car­o­li­na, is the holy ter­ror it is at the moment. And there is much more to it than the 82nd Divi­sion. So the time bomb of ura­ni­um and rare earth ele­ments dearth is tick­ing. And lit­tle idea do we have of the time it is set for. Or wheth­er, when it final­ly goes off, some­body might remem­ber the first mas­sive appli­ca­tion of ura­ni­um, which turned thou­sands into ash­es some 67 years ago. And be temp­ted to use it again. For 67 years now, we have been show­ing rea­son and sur­viv­ing. Let us hope fierce defi­cien­cy of nat­u­ral resour­ces, food and water that is loom­ing will not take it away from us.

#### These wars are likely - uranium’s role in nuclear weaponization makes militarization of its insecurity inevitable.

Emily Meirding, 2011, “Energy Security and Sub-Saharan Africa,” International Review of Politics and Development (translated from French, http://poldev.revues.org/744

However, the economic ease of raw material access is only one aspect of international uranium security concerns. Given uranium’s role in nuclear weapons technology, resource control is also regarded as a military security issue. These concerns can be overblown; raw uranium poses little military threat. In order to ‘weaponise’ the material, it must be mined, milled to create yellowcake, converted into a gas, then enriched to increase its percentage of U-235, the fissile isotope. Usually, only the first two of these steps occur in less developed, uranium-endowed countries. Since enrichment is extremely costly, few states have developed domestic facilities, especially for enriching up to the 90 per cent U-235 threshold required to fuel research reactors and create nuclear weapons. Most enriched uranium is currently produced by only three companies, namely Russia’s Rosatom, Europe’s Enrichment Technology Company and the United States Enrichment Corporation.7 Thus, there is usually a geographic disconnect between suppliers of raw uranium resources and sites of potential military insecurity. Nonetheless, even limited insecurity in uranium-endowed states can have broad political repercussions; in 2003 American officials used reports of the transmission of yellowcake from Niger into Iraq to reinforce their claims that Saddam Hussein posed an imminent threat to international security prior to the US invasion (Hersh, 2003).

#### Uranium shortages and supply concerns will specifically cause war between the U.S. and China.

Stephen Burgess, 2010, is Associate Professor, Department of International Security, U.S. Air War College, published numerous articles and book chapters on African security issues, helped to lead in the organization and execution of the Air Force Africa Command Symposium held at Air University, is also an Associate Director of the U.S. Air Force Counterproliferation Center, holds a Ph.D. from Michigan State University and has been a faculty member at Vanderbilt University, the University of Zambia, the University of Zimbabwe, and Hofstra University, U.S. Air Force Institute for National Security, “ SUSTAINABILITY OF STRATEGIC MINERALS IN SOUTHERN AFRICA AND POTENTIAL CONFLICTS AND PARTNERSHIPS,” p. 3, <http://www.dtic.mil/dtic/tr/fulltext/u2/a535875.pdf>

For more than four decades, the supply of minerals has been a concern for the United States, and it will continue to be so.3 The principal sustainability challenge in Southern Africa for the United States and its allies is uncertain access to strategic minerals, especially platinum group metals (PGMs), chromium and manganese, as well as rare earth minerals, cobalt and uranium. The causes of this challenge are increasing global demand and supply shortages caused by inadequate infrastructure, politicization of the mining industry, and China‟s aggressive and sometimes monopolistic behavior in pursuit of minerals.4 The challenge is most acute in two Southern African countries - South Africa and the Democratic Republic of the Congo (DRC) – and also growing in Zambia, Zimbabwe and Namibia. Environmental sustainability of the mining industry is also a concern; for example, acid mine water in South Africa poses a threat to platinum group metals (PGMs) mining, which is of considerable importance to the United States.5 The purpose here is to provide scope to and analysis of the problem of the sustain-ability of scarce mineral resources and recommend what the United States can do to ensure continued access. This report provides insight into the sustainability of mineral resources that come from Southern Africa and that are of strategic importance to the United States and its allies. It analyzes the competition as well as the potential for conflict over resources. Of particular concern is possible future conflict between the United States, which needs strategic minerals for national defense and other purposes, and China, which needs an increasing amount of resources to fuel its accelerating industrialization.6 There is a rising scramble for and struggle over resources in Africa, especially in petroleum and mining economies.7 In particular, China and Chinese companies have increased their presence throughout Africa and have often engaged in practices that tend to exclude Western companies from access to mineral resources. Exclusionary practices have been known to cause threats to sustainability of the flow over resources. This rising struggle over resources comes at a time in which the United States is becoming increasingly concerned about access to and sustainability of strategic natural resources. In particular, the U.S. government is concerned about access to “defense critical resources”.8 At issue is how the United States and its allies can guarantee access to and help sustain these resources until viable substitutes or new technologies make them less critical. This requires increased levels of engagement with the African countries concerned, using all the instruments of American power and working with American and Western mining companies, as well as engagement with China and Chinese companies. In the future, a “worst-case” scenario might see the United States having to use coercive diplomacy in the not too-distant future (perhaps in 10-20 years) in order to regain access to vital resources. The onset of “resource wars” has been predicted by a number of scholars and experts. Given the rising level of Chinese demand for resources, the probability of conflict is likely to rise.

#### U.S.-China war prompts miscalculation leading to nuclear war.

Susan Shirk, 2007, is the chair of the 21st Century China Program and Ho Miu Lam Professor of China and Pacific Relations at the School of International Relations and Pacific Studies (IR/PS) at UC San Diego, also is director emeritus of the University of California, Institute on Global Conflict and Cooperation (IGCC), and chair of the IGCC International Advisory Board, China: Fragile Superpower, p. 261, Google Books

We cannot control whether China's leaders heed our advice to them. But we can control how we ourselves think about and behave toward China, which is all the more important because we can't count on China always to act responsibly or in its own best interest. Everything Americans say and do regarding China reverberates through Chinese domestic politics. Just as Americans are wondering if a rising China will threaten us, the Chinese are wondering about America's intentions toward China. Can America learn to live with rising China? Or as the number one power in the world, is America bound to try to keep China weak to maintain its own position? China's people, and its leaders, are listening to what we say and watching what we do. Historically, rising powers cause war not necessarily because they are innately belligerent, but because the reigning powers mishandle those who challenge the status quo in one way or another. Based on history, the prognosis for relations between rising powers like China and reigning powers like the United States is poor. It could produce direct conflict between two nuclear powers. The costs of such a conflict would be devastating not just for the two societies but for the rest of Asia and the entire world.

#### Economic interdependence for China just makes nationalistic drives to consolidate resources – this re-inforces the likelihood for conflict.

Wu Xinbo, April 2008, Dean at Fudan university, associate professor at center for American studies, and editor of Washington quarterly, United States Institutes of Peace, “Managing crisis and sustained peace between China and the United States,” Lexis Nexis

While growing economic interdependence and expanding cooperation on international affairs has helped stabilize relations between China and the United States, the strong mutual suspicion and their diverse interests in East Asia also give rise to uncertainty. Even if a systemic strategic rivalry between the two countries can be avoided in the future, some crises are almost inevitable and, if not well managed, will produce both short- and long-term negative impacts on bilateral ties. In a worst-case scenario, it may lead to some kind of military standoff between China and the United States . As Susan Shirk has pointed out, “A future crisis with the United States, especially one involving Taiwan or Japan, could arouse the public’s ire to the degree that China’s leaders might believe that the regime would fall unless they respond militarily to the insult to national honor.” This section of the monograph will discuss how to avoid future crises and how to manage them should they arise. Because so much of the literature on this subject is devoted primarily to the general principles regarding crisis management,I will try to develop a set of specific, tailor-made recommendations about how to avoid and manage various possible crises between the two nations.

#### Only the plan solves through new cooperation with China.

Tom Blees, 2008, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, Prescription for the Planet, p. 310-2

At the same time, China’s leaders see energy shortages as one of the biggest potential threats to their national stability, and probably rightly so. With foreign exchange reserves of over a trillion dollars at the end of 2006, the country’s plans to secure energy supplies for its continued growth extend around the globe and only exacerbate international tensions over energy supplies. Chinese officials have not been reluctant to state their intentions to hunt for224 Kirk Smith Ph.D., Health Burden from Indoor Air Pollution in China (Berkeley, CA: World Health Organization, 2003).311new supplies of oil and natural gas.225 With concerns over peak oil furrowing the brows of leaders around the world, this big new kid on the block brings added pressure to an already volatile situation. Nuclear power now provides barely two percent of China’s electricity, and their goals for the next decade or so are relatively modest but not inconsequential. This is due in part to the fact that up-front capital costs for nuclear power plants are high, and also to the fact that China lacks sizeable uranium reserves. These factors combined with easy access to coal would seem to make for dim prospects of China embracing a predominantly nuclear power scheme in the near future. Yet the many advantages of fast reactors are not at all lost on the Chinese. Indeed, they have a small one under construction near Beijing that’s due to achieve criticality in 2008, and plans for a 600MW prototype with a target date of 2015. Russia has been cooperating with China on breeder technology since 2000, and they expect fast reactors to become the predominant design by midcentury.226 Meanwhile they are involved with Russia and South Africa in planning pebble bed reactors. For anyone concerned about long-lived nuclear waste this will be a cause for concern, for the waste issuing from pebble bed reactors is quite incapable of being recycled, and adds immensely to the volume of waste because of how it’s mixed with graphite. Despite their easy and relatively cheap access to coal, it is nevertheless not free for the Chinese or anyone else. Although nuclear power plants are expensive up front, once fast reactors have225 BBC, "China Mulls Energy Reserves Spend," in BBC News International Edition (Dec 27, 2006).226 WNA, "Nuclear Power in China," (World Nuclear Association, Apr 2008).312been built the fuel will be essentially free for hundreds of years. Considering the serious environmental costs of coal, if those costs were ever to be factored into the equation (and they will be) there is little doubt China would seriously consider inclusion in a global IFR program. Clearly they are looking in that direction. Coupled with GREAT’s boron fuel concept as a preemptive strike against looming vehicle emission problems as their society goes more mobile, the temptation to become a full international player in the program would likely be quite irresistible. The technology sharing that is part and parcel of the GREAT proposal would allow China to move quickly to the forefront of IFR deployment, and not a moment too soon. As for their new coal plants, the stranded costs could be substantially reduced if fast reactors were to be built at existing coal plant sites. (This applies to all countries where coal plants have recently been built.) It would be possible at that point to patch the reactors into the existing turbines and auxiliary equipment, leaving only the coal burner itself as a lost investment. Where logistical considerations would make it unfeasible to do so, nuclear batteries could be employed in clusters to match the capacity of the already installed turbines. Toshiba and others are chomping at the bit to deploy nuclear batteries, with designs already at hand. While scrapping the coal burner wouldn’t be a trifling matter, the ability to utilize the rest of the power plant would ease the pain, and the benefits to China and the rest of the world would be well worth the cost.

### Advantage 3 is Spent Fuel

#### Utilities currently store waste in interim storage on site – no reprocessing forces this option.

Robert Alvarez, May 2011, is a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, former secretary in the DOE, “Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage”, Institute for Policy Studies, <http://www.scribd.com/doc/95322584/Spent-Nuclear-FuelPools-in-the-U-S-Reducing-the-Deadly-Risks-of-Storage>

This tragic event is casting a spotlight on the spent fuel pools at U.S. nuclear reactors, which store some of the largest concentrations of radioactivity on the planet. For nearly 30 years, Nuclear Regula-tory Commission waste-storage requirements have been contingent on the timely opening of a permanent waste repository. This has allowed plant operators to legally store spent fuel in onsite cooling pools much longer, and at higher densities (on average four times higher), than was originally intended. Spent fuel pools were designed to be temporary and to store only a small fraction of what they currently hold. “Neither the AEC [Atomic Energy Com-mission, now the Energy Department] nor utilities anticipated the need to store large amounts of spent fuel at operating sites,” said a report by Dominion Power, the owner of the Millstone nuclear reactor in Waterford, Connecticut in October 2001. “Large-scale commercial reprocessing never materialized in the United States. As a result, operating nuclear sites were required to cope with ever-increasing amounts of irradiated fuel... This has become a fact of life for nuclear power stations.

#### U.S. spent fuel pools are a unique risk for mass radiation leaks due to poor protection.

Robert Alvarez, May 2011, is a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, former secretary in the DOE, “Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage”, Institute for Policy Studies, <http://www.scribd.com/doc/95322584/Spent-Nuclear-FuelPools-in-the-U-S-Reducing-the-Deadly-Risks-of-Storage>

Nearly 40 percent of the radioactivity in U.S. spent fuel is cesium-137 (4.5 billion curies) — roughly 20 times more than released from all atmospheric nuclear weapons tests. U.S. spent pools hold about15-30 times more cesium-137 than the Chernobyl ac-cident released. For instance, the pool at the Vermont Yankee reactor, a BWR Mark I, currently holds nearly three times the amount of spent fuel stored at Dai-Ichi's crippled Unit 4 reactor. The Vermont Yankee reactor also holds about seven percent more radioactivity than the combined total in the pools at the four troubled reactors at the Fukushima site. Even though they contain some of the larg-est concentrations of radioactivity on the planet, U.S. spent nuclear fuel pools are mostly contained in ordi-nary industrial structures designed to merely protect them against the elements. Some are made from ma-terials commonly used to house big-box stores and car dealerships. The United States has 31 boiling water reactors (BWR) with pools elevated several stories above ground, similar to those at the Fukushima Dai-Ichi station. Asin Japan, all spent fuel pools at nuclear power plants do not have steel-lined, concrete barriers that cover reactor vessels to prevent the escape of radioactivity. They are not required to have back-up generators to keep used fuel rods cool, if off site power is lost. The 69 Pressurized Water (PWR) reactors operating in the U.S. do not have elevated pools, and also lack proper containment and several have large cavities beneath them which could exacerbate leakage.

#### Accident is likely now - the majority of U.S. spent fuel pools are in earthquake zones.

Robert Alvarez, May 2011, is a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, former secretary in the DOE, “Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage”, Institute for Policy Studies, <http://www.scribd.com/doc/95322584/Spent-Nuclear-FuelPools-in-the-U-S-Reducing-the-Deadly-Risks-of-Storage>

There are 104 U.S. commercial nuclear reactors operating at 64 sites in 31 states that are holding some of the largest concentrations of radioactivity on the planet in onsite spent fuel pools. The pools, typically rectangular or L-shaped basins about 40to 50 feet deep, are made of reinforced concrete walls four to five feet thick and stainless steel liners. Basins without steel liners are more susceptible to cracks and corrosion. Most of the spent fuel ponds at boiling water reactors are housed in reactor buildings several stories above ground. Pools at pressurized water reactors are partially or fully embedded in the ground, sometimes above tunnels or underground rooms. According to estimates provided by the Department of Energy, as of this year this spent fuel contains a total of approximately 12 billion curies of long-lived radioactivity (Table 1).6 Of the 65,000 metric tons estimated by the Nuclear Energy Institute to be generated by the end of 2010, 75 percent is in pools, while the remainder is in dry storage casks. Several of these reactors are located in earthquake zones (Figure 5).

#### No time to contain a U.S. waste spill due to an earthquake.

Tony Dutzik, 3-17-2011, is senior policy analyst, “What Are the Risks Posed by Spent Fuel Pools in the United States?,” Frontier Group, http://www.frontiergroup.org/blogs/blog/fg/what-are-risks-posed-spent-fuel-pools-united-states

The risks of radiation releases from the loss of coolant from spent fuel pools are quite real. Indeed, the occurrence of an earthquake that exceeds the design basis of the nuclear plant has been identified as one of the most probable causes of a loss-of-coolant accident involving spent fuel. In 2006, the U.S. National Research Council issued a detailed report on the risk posed by a terrorist attack on spent fuel pools at nuclear reactors. Among the authors’ conclusions were that “under some conditions, a terrorist attack that partially or completely drained a spent fuel pool could lead to a propagating zirconium cladding fire and the release of large quantities of radioactive materials to the environment.” The report also cited a 2001 Nuclear Regulatory Commission study, summarizing it as follows: “The analysis suggested that large earthquakes and drops of fuel casks from an overhead crane during transfer operations were the two event initiators that could lead to a loss-of-pool-coolant accident. For cases where active cooling (but not the coolant) has been lost, the thermal-hydraulic analyses suggested that operators would have about 100 hours (more than four days) to act before the fuel was uncovered sufficiently through boiling of cooling water in the pool to allow the fuel rods to ignite. This time was characterized as an 'underestimate' given the simplifications assumed for the loss-of-pool-coolant scenario.”

#### PRISMs utilize spent fuel pools as catalysts for energy - eliminates waste.

W.H. Hannum et. al, 2010, has been a senior official with the Department of Energy, H.F. McFarlane earned his Ph.D. in engineering science at California Institute of Technology, is currently associate director of the Technology Development Division at Argonne National Laboratory, D.C. Wade is a Senior Technical Advisor, Distinguished Fellow Engineer Nuclear Engineering Division Argonne National Laboratory, R.N. Hill is the Technical Director at Argonne National Laboratory, Nuclear Energy R&D Nuclear Engineering Division, “The Benefits of an Advanced Fast Reactor Fuel Cycle for Plutonium Management,” p. 18, <http://www.osti.gov/bridge/servlets/purl/459313-d9NYz8/webviewable/>

Plutonium is a fact. World inventories currently exceed 1000 tonnes, and are increasing at 60 to 80 tonnes per year. This can be considered a valuable energy resource or a political and environmental burden, The best approach is that which will maximize the benefits and minimize the burden. A closed fast reactor he1 cycle using an advanced recycle technology provides such an option by using plutonium as a catalyst to extract the full energy content from the world’s uranium reserves, while eliminating excess inventories of plutonium and of other long lived transuranic byproducts. Such a system is fully compatible with rigorous safeguards, and in fact presents few safeguard challenges beyond those which are associated with the once-thorough fuel cycle. The most important long-term contribution of the fast reactor approach to safeguards and prevention of proliferation is that it provides a positive means of managing the overall size of the world’s plutonium and transuranic inventory (Ref. 30). With a kel cycle management strategy driven by economics, the fast reactor can readily absorb excess plutonium stocks, leaving the world inventory sequestered in plants producing useful energy.

#### Massive ionizing radiation release makes extinction inevitable.

Rosalie Bertell, 2000, American physician and epidemiologist and winner of several awards, including the Hans-Adalbert-Schweigart-Medal (1983), Right Livelihood Award (1986) World Federalist Peace Award, Ontario Premier's Council on Health, Health Innovator Award, the United Nations Environment Programme Global 500 award, and the Sean MacBride International Peace Prize, “Part One: The Problem: Nuclear Radiation and its Biological Effects,” No Immediate Danger, Prognosis for a Radioactive Earth, The Book Publishing Company, <http://www.ratical.org/radiation/NRBE/NRBE9.html>

In 1964 Hermann Müller published a paper, `Radiation and Heredity', spelling out clearly the implications of his research for genetic effects (damage to offspring) of ionizing radiation on the human species. [17] The paper, though accepted in medical/biological circles, appears not to have affected policy makers in the political or military circles who normally undertake their own critiques of published research. Müller predicted the gradual reduction of the survival ability of the human species as several generations were damaged through exposure to ionizing radiation. This problem of genetic damage continues to be mentioned in official radiation-health documents under the heading `mild mutations'[18] but these mutations are not `counted' as health effects when standards are set or predictions of health effects of exposure to radiation are made. There is a difficulty in distinguishing mutations caused artificially by radiation from nuclear activities from those which occur naturally from earth or cosmic radiation. A mild mutation may express itself in humans as an allergy, asthma, juvenile diabetes, hypertension, arthritis, high blood cholesterol level, slight muscular or bone defects, or other genetic `mistakes'. These defects in genetic make-up leave the individual slightly less able to cope with ordinary stresses and hazards in the environment. Increasing the number of such genetic `mistakes' in a family line, each passed on to the next generation, while at the same time increasing the stresses and hazards in the environment, leads to termination of the family line through eventual infertility and/or death prior to reproductive age. On a large scale, such a process leads to selective genocide of families or species suicide.

#### Environmental impact of a nuclear war.

Leah Ayala, Winter 2003, “Nuclear Power Companies the Department of Energy: A Legal Remedy Magnifying Nuclear Ends,” Nevada Law Journal, Lexis Nexis

A very small amount of nuclear waste can be disastrous. If an amount of plutonium about the same size as a beach ball was properly dispersed, it could cause lung cancer in everyone on earth. R. Routley & V. Routley, Nuclear Energy and Obligations to the Future, 21 INQUIRY 133, 136 (1978). See generally Robin Dusek, Lost in Space?: The Legal Feasibility of Nuclear Waste Disposal in Outer Space, 22 WM. & MARY ENVTL. L. & POL'Y REV. 181 (1997). Some estimate that a large release of nuclear waste from Yucca Mountain, which has a capacity to hold 77,000 metric tons of waste, would exceed the environmental impact of a nuclear war. This is a huge amount of waste compared to the "few dozen pounds" of waste released in the Chernobyl explosion that is estimated will result in between 17,000 to 475,000 human deaths from cancer. Broad, supra note 132. Each of the spent fuel assemblies that will be stored in the repository contains a similar amount of radioactivity as ten Hiroshima bombs. Lazarus, supra note 1 (citing Klaus Schumann, a Green Party activist and member of the San Luis Obispo County Nuclear Waste Management Committee).

### SOLVENCY

#### Loan guarantees are key to establishing PRISM reactors.

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The construction of an aqueous solvent extraction plant would be out of date, especially when the more promising option of pyroprocessing is on the horizon. In comparison, to current available methods, pyroprocessing produces virtually no waste, can be done on-site, and offers the option of fabricating proliferation resistant fuel from plutonium as well as uranium. The second question in regard to domestic reprocessing is, “how much direct involvement should the government have in the reprocessing business?” Government involvement could be justified on the grounds of the externalities present in nuclear waste disposal. This could take on a variety of forms - government research efforts, subsidizing reprocessing (or offering tax credits and loan guarantees), or even operating a reprocessing center on its own. Through its actions, the government will be able to influence the development and growth of the nuclear reprocessing industry in the United States. These efforts in support of pyroprocessing and other advanced fuel cycle technologies represent a small portion of the Department of Energy budget - only $142,652,000 out of a total of $33,856,453,000 in discretionary funding in FY 2009, or less than half of one percent98. Furthermore, private companies do not have sufficient independent incentives to reduce the long-term health and environmental consequences of nuclear waste disposal. While it is beyond the scope of this paper to present a formal costbenefit analysis of R&D efforts, given the minimal costs and the large potential benefits, the chances of success do not need to be very high to justify continued government expenditures in this area.

#### PRISM’s are at low cost and have expedited construction because of a pre-licensed design – solves emission problems.

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GE Hitachi Nuclear Energy, GEH next evolution of the Na cooled reactor technology is the Power Reactor Innovative Small Modular, PRISM reactor concept. The use of Na as a coolant allows for a fast neutrons spectrum in the core allowing breeding; hence a long time between refuellings. In addition, the hard neutron spectrum fissions the transuranic elements produced in the U-Pu fuel cycle, converting them into shorter lived fission products. This produces useful energy as well as reduces the volume and complexity of the U-Pu cycle waste disposal problem. The concept can also be used for consuming the transuranics in used nuclear fuel from water cooled reactors. Sodium-cooled reactors enjoy a safety aspect of operating at low pressure compared with light water cooled reactors. The PRISM reactor employs passive safety design features. Its simple design, allows factory fabrication with modular construction and ultimately lower costs. Passive core cooling is used enhancing the reactor’s safety. The residual or decay heat is passively released to the atmosphere with the elimination of active safety systems. Electromagnetic pumps without moving parts are used, eliminating valves and motors used in other nuclear island designs. The standardized modular design allows for an expedited construction schedule due to pre-licensed design, and factory fabrication. PRISM has a reference construction schedule of 36 months. A single PRISM power block generating 622 MWe the same amount of electricity generated in the USA through conventional sources would reduce greenhouse gas emissions

by an amount equivalent to taking 700,000 cars off the road while at the same time offering the possibility of acting as an actinides burner consuming LWRs used nuclear fuel.

## version two

### plan

#### Plan: The United States Federal Government should substantially increase commercial loan guarantees to develop and deploy Power Reactor Innovative Small Module reactors for the purpose of energy production in the United States.

### 1AC prolif advantage

#### ADVANTAGE:\_\_ proliferation

#### Rapid cascade proliferation at the tipping point.

Graham Allison, January/February 2010, Director of Harvard's major Center for Science and International Affairs, as for three decades been a leading analyst of U.S. national security and defense policy with a special interest in nuclear weapons, terrorism, and decision-making, Assistant Secretary of Defense in the first Clinton Administration, Defense Medal for Distinguished Public Service, Organizer of the Commission on America's National Interests, Foreign Policy, “Nuclear Disorder,” Ebsco Host

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 n 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.

#### Proliferation causes nuclear war and extinction – deterrence fails for three reasons.

Matthew Kroenig, 5-26-2012, assistant professor in the Department of Government at Georgetown University and a research affiliate with The Project on Managing the Atom at Harvard University, he served as a strategist on the policy planning staff in the Office of the Secretary of Defense where he received the Office of the Secretary of Defense’s Award for Outstanding Achievement. He is a term member of the Council on Foreign Relations and has held academic fellowships from the National Science Foundation, the Belfer Center for Science and International Affairs at Harvard University, the Center for International Security and Cooperation at Stanford University, and the Institute on Global Conflict and Cooperation at the University of California, “The History of Proliferation Optimism: Does It Have A Future?,” http://www.npolicy.org/article.php?aid=1182andrtid=2

The spread of nuclear weapons poses a number of severe threats to international peace and U.S. national security including: nuclear war, nuclear terrorism, emboldened nuclear powers, constrained freedom of action, weakened alliances, and further nuclear proliferation. This section explores each of these threats in turn. Nuclear War. The greatest threat posed by the spread of nuclear weapons is nuclear war. The more states in possession of nuclear weapons, the greater the probability that somewhere, someday, there is a catastrophic nuclear war. A nuclear exchange between the two superpowers during the Cold War could have arguably resulted in human extinction and a nuclear exchange between states with smaller nuclear arsenals, such as India and Pakistan, could still result in millions of deaths and casualties, billions of dollars of economic devastation, environmental degradation, and a parade of other horrors. To date, nuclear weapons have only been used in warfare once. In 1945, the United States used one nuclear weapon each on Hiroshima and Nagasaki, bringing World War II to a close. Many analysts point to sixty-five-plus-year tradition of nuclear non-use as evidence that nuclear weapons are unusable, but it would be naïve to think that nuclear weapons will never be used again. After all, analysts in the 1990s argued that worldwide economic downturns like the great depression were a thing of the past, only to be surprised by the dot-com bubble bursting in the later 1990s and the Great Recession of the late Naughts. [53] This author, for one, would be surprised if nuclear weapons are not used in my lifetime. Before reaching a state of MAD, new nuclear states go through a transition period in which they lack a secure-second strike capability. In this context, one or both states might believe that it has an incentive to use nuclear weapons first. For example, if Iran acquires nuclear weapons neither Iran, nor its nuclear-armed rival, Israel, will have a secure, second-strike capability. Even though it is believed to have a large arsenal, given its small size and lack of strategic depth, Israel might not be confident that it could absorb a nuclear strike and respond with a devastating counterstrike. Similarly, Iran might eventually be able to build a large and survivable nuclear arsenal, but, when it first crosses the nuclear threshold, Tehran will have a small and vulnerable nuclear force. In these pre-MAD situations, there are at least three ways that nuclear war could occur. First, the state with the nuclear advantage might believe it has a splendid first strike capability. In a crisis, Israel might, therefore, decide to launch a preemptive nuclear strike to disarm Iran’s nuclear capabilities and eliminate the threat of nuclear war against Israel. Indeed, this incentive might be further increased by Israel’s aggressive strategic culture that emphasizes preemptive action. Second, the state with a small and vulnerable nuclear arsenal, in this case Iran, might feel use ‘em or loose ‘em pressures. That is, if Tehran believes that Israel might launch a preemptive strike, Iran might decide to strike first rather than risk having its entire nuclear arsenal destroyed. Third, as Thomas Schelling has argued, nuclear war could result due to the reciprocal fear of surprise attack.[54] If there are advantages to striking first, one state might start a nuclear war in the belief that war is inevitable and that it would be better to go first than to go second. In a future Israeli-Iranian crisis, for example, Israel and Iran might both prefer to avoid a nuclear war, but decide to strike first rather than suffer a devastating first attack from an opponent. Even in a world of MAD, there is a risk of nuclear war. Rational deterrence theory assumes nuclear-armed states are governed by rational leaders that would not intentionally launch a suicidal nuclear war. This assumption appears to have applied to past and current nuclear powers, but there is no guarantee that it will continue to hold in the future. For example, Iran’s theocratic government, despite its inflammatory rhetoric, has followed a fairly pragmatic foreign policy since 1979, but it contains leaders who genuinely hold millenarian religious worldviews who could one day ascend to power and have their finger on the nuclear trigger. We cannot rule out the possibility that, as nuclear weapons continue to spread, one leader will choose to launch a nuclear war, knowing full well that it could result in self-destruction. One does not need to resort to irrationality, however, to imagine a nuclear war under MAD. Nuclear weapons may deter leaders from intentionally launching full-scale wars, but they do not mean the end of international politics. As was discussed above, nuclear-armed states still have conflicts of interest and leaders still seek to coerce nuclear-armed adversaries. This leads to the credibility problem that is at the heart of modern deterrence theory: how can you threaten to launch a suicidal nuclear war? Deterrence theorists have devised at least two answers to this question. First, as stated above, leaders can choose to launch a limited nuclear war.[55] This strategy might be especially attractive to states in a position of conventional military inferiority that might have an incentive to escalate a crisis quickly. During the Cold War, the United States was willing to use nuclear weapons first to stop a Soviet invasion of Western Europe given NATO’s conventional inferiority in continental Europe. As Russia’s conventional military power has deteriorated since the end of the Cold War, Moscow has come to rely more heavily on nuclear use in its strategic doctrine. Indeed, Russian strategy calls for the use of nuclear weapons early in a conflict (something that most Western strategists would consider to be escalatory) as a way to de-escalate a crisis. Similarly, Pakistan’s military plans for nuclear use in the event of an invasion from conventionally stronger India. And finally, Chinese generals openly talk about the possibility of nuclear use against a U.S. superpower in a possible East Asia contingency. Second, as was also discussed above leaders can make a “threat that leaves something to chance.”[56] They can initiate a nuclear crisis. By playing these risky games of nuclear brinkmanship, states can increases the risk of nuclear war in an attempt to force a less resolved adversary to back down. Historical crises have not resulted in nuclear war, but many of them, including the 1962 Cuban Missile Crisis, have come close. And scholars have documented historical incidents when accidents could have led to war.[57] When we think about future nuclear crisis dyads, such as India and Pakistan and Iran and Israel, there are fewer sources of stability that existed during the Cold War, meaning that there is a very real risk that a future Middle East crisis could result in a devastating nuclear exchange.

#### Central question of the nonproliferation regime is disposal of nuclear fuel - not solving will undercut the global nuclear order.

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GROWING CYNICISM about the nonproliferation regime also threatens to undercut the global nuclear order. It is easy to see why non-nuclear-weapons states view the regime as an instrument for the haves to deny the have-nots. At the NPT Review Conference in 2000, the United States and other nuclear weapons states promised to take 13 "practical steps" toward meeting their NPT commitments, but later, at the Review Conference in 2005, John Bolton, then the U.S. ambassador to the UN, declared those 2000 undertakings inoperable and subsequently banned any use of the word "disarmament" from the "outcome document" of the UN's 60th anniversary summit. In preparation for the 2010 Review Conference, which will convene in May, diplomats at the IAEA have been joined by prime ministers and presidents in displaying considerable suspicion about a regime that permits nuclear weapons states to keep their arsenals but prevents others from joining the nuclear club. Those suspicions are reflected in governments' unwillingness to accept additional constraints that would reduce the risks of proliferation, such as by ratifying the enhanced safeguards agreement known as the Additional Protocol or approving an IAEA-managed multinational fuel bank to ensure states access to fuel for nuclear energy plants. At the same time, rising concerns about greenhouse gas emissions have stimulated a growing demand for nuclear energy as a clean-energy alternative. There are currently 50 nuclear energy plants under construction, most of them in China and India, and 130 more might soon be built globally. Concern arises not from the nuclear reactors themselves but from the facilities that produce nuclear fuel and dispose of its waste product. The hardest part of making nuclear weapons is producing fissile material: enriched uranium or plutonium. The same setup of centrifuges that enriches uranium ore to four percent to make fuel for nuclear power plants can enrich uranium to 90 percent for nuclear bombs. A nuclear regime that allows any state with a nuclear energy plant to build and operate its own enrichment facility invites proliferation. The thorny question is how to honor the right of non-nuclear-weapons states, granted by the NPT, to the "benefits of peaceful nuclear technology" without such a consequence.

#### Dealing with waste is inevitable in the squo – using PRISM is the only method of securing fissile material from theft and stopping proliferation.

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The temptation, when a great mistake has been made, is to seek ever more desperate excuses to sustain the mistake, rather than admit the terrible consequences of what you have done. But now, in the UK at least, we have an opportunity to make amends. Our movement can abandon this drivel with a clear conscience, for the technology I am about to describe ticks all the green boxes: reduce, reuse, recycle. Let me begin with the context. Like other countries suffering from the idiotic short-termism of the early nuclear power industry, the UK faces a massive bill for the storage and disposal of radioactive waste. The same goes for the waste produced by nuclear weapons manufacturing. But is this really waste, or could we see it another way? In his book Prescription for the Planet, the environmentalist Tom Blees explains the remarkable potential of integral fast reactors (IFRs) (11). These are nuclear power stations which can run on what old nuclear plants have left behind. Conventional nuclear power uses just 0.6% of the energy contained in the uranium that fuels it. Integral fast reactors can use almost all the rest. There is already enough nuclear waste on earth to meet the world’s energy needs for several hundred years, with scarcely any carbon emissions. IFRs need be loaded with fissile material just once. From then on they can keep recycling it, extracting ever more of its energy, until a small fraction of the waste remains. Its components have half-lives of tens rather than millions of years. This makes them more dangerous, but much easier to manage in the long term. When the hot waste has been used up, the IFRs can be loaded with depleted uranium (U-238), of which the world has a massive stockpile (12).The material being reprocessed never leaves the site: it remains within a sealed and remotely-operated recycling plant. Anyone trying to remove it would quickly die. By ensuring the fissile products are unusable, the IFR process reduces the risk of weapons proliferation. The plant operates at scarcely more than atmospheric pressure, so it can’t blow its top. Better still, it could melt down only by breaking the laws of physics. If the fuel pins begin to overheat, their expansion stops the fission reaction. If, like the Fukushima plant, an IFR loses its power supply, it simply shuts down, without human agency. Running on waste, with fewer pumps and valves than conventional plants, they are also likely to be a good deal cheaper (13).So there’s just one remaining question: where are they? In 1994 the Democrats in the US Congress, led by John Kerry, making assertions as misleading as the Swift Boat campaign that was later deployed against him(14), shut down the research programme at Argonne National Laboratories that had been running successfully for 30 years. Even Hazel O’Leary, the former fossil fuel lobbyist charged by the Clinton administration with killing it, admitted that “no further testing” is required to prove its feasibility (15).But there’s a better demonstration that it’s good to go: last week GE Hitachi (GEH) told the British government that it could build a fast reactor within five years to use up the waste plutonium at Sellafield, and if it doesn’t work, the UK won’t have to pay (16). A fast reactor has been running in Russia for 30 years (17) and similar plants are now being built in China and India (18, 19). GEH’s proposed PRISM reactor uses the same generating technology as the IFR, though the current proposal doesn’t include the full reprocessing plant. It should. If the government does not accept GEH’s offer, it will, as the energy department revealed on Thursday, handle the waste through mixed oxide processing (mox) instead (20). This will produce a fuel hardly anyone wants, while generating more waste plutonium than we possess already. It will raise the total energy the industry harvests from 0.6% to 0.8% (21). So we environmentalists have a choice. We can’t wish the waste away. Either it is stored and then buried. Or it is turned into mox fuels. Or it is used to power IFRs. The decision is being made at the moment, and we should determine where we stand. I suggest we take the radical step of using science, not superstition, as our guide.

#### Transitioning to PRISMs stops PUREX/UREX development and solves verification difficulties.

John Carlson, 6-4-2009, director general of the Australian Safeguards and Non-proliferation Office, “New Verification Challenges”, research paper has been commissioned by the International Commission on Nuclear Non-proliferation and Disarmament, <http://icnnd.org/Documents/Carlson_Verification_090604.doc>

The verification challenges for the FMCT are expected to be: having to implement verification approaches in old facilities not designed with verification in mind. These are likely to require intensive verification effort - the more of these facilities that can be shut down and decommissioned, the more manageable the verification task will be:- there will be no reason to continue operation of facilities used only for weapons programs (since the NWS have had informal moratoria on fissile production for weapons for many years, presumably no such facilities are operating now);- there should be little if any need to produce HEU (the states with large naval propulsion programs have extensive HEU stocks to draw on);- with advanced spent fuel recycling technologies which will avoid the need to separate plutonium – such as pyro-processing – on the horizon, there should be little or no requirement for new conventional (Purex-based) reprocessing plants, and existing plants could be phased out over time; the verification workload. This highlights the importance of shutting down as many sensitive facilities as possible, and transitioning to new fuel cycle technologies. A state-level approach, discussed below, will also be important for cost-efficient verification; establishing a reliable capability for detecting undeclared fissile material production.

#### Bargaining breaks down with uncertainty and overconfidence from proliferation.

Erik Gartzke, 5-1-2010, Ph.D. in Political Science from the University of Iowa, associate professor of political science at UC San Diego, “Nuclear Proliferation Dynamics and Conventional Conflict,” http://dss.ucsd.edu/~egartzke/papers/nuketime\_05032010.pdf

A third possibility is that uncertainty about nuclear weapons status increases the hazard of militarized disputes. In contrast to the classical approach that emphasizes power relations, contemporary research on the causes of conflict focuses on the role of asymmetric information (Fearon 1995, Wagner 2000). Nations are more likely to fight if they underestimate one another’s respective resolve or capabilities. Bargaining breaks down when competitors cannot identify acceptable offers. Bargaining failures in turn heighten the probability of disputes. If nations are more likely to fight when they are uncertain about an enemy's capabilities, then capability shocks that make nations uncertain about the balance of power will lead to an increase in conflict. Countries with new military advantages may not yet be perceived as possessing significant advantages. Alternately, the proliferating country may itself overestimate the scale of its advantage. Nuclear proliferation is particularly prone to producing this type of uncertainty, given the extreme nature of nuclear capabilities shocks, the secrecy that enshrouds nuclear programs, and the fact that nuclear capabilities are not actually exercised (as opposed to the influence nuclear nations wield). Just as uncertainty peaks with the advent of possible new nuclear status, it decays quickly with the revelation of nuclear capabilities. Certainty about nuclear weapons capability may make countries no more dispute prone than certainty about the lack of nuclear status. War and peace are conditioned on nuclear secrecy or on nuclear uncertainty, not on the proliferation of nuclear weapons per se.8 The effects of uncertainty about nuclear status on whether nations initiate, or are the targets of, conflict are a bit more complicated to unravel. It is possible that uncertainty about nuclear status could lead to bargaining failure, and thus to a greater risk of a contest for either a potential initiator or a target. In the standard bargaining story, a state possesses an advantage about which its counterpart is dubious, either because other states also claim such an advantage, or because it is difficult to ascertain the consequences of the advantage for warfare, should conflict occur. Opponents can also be uncertain about the resolve or preferences of a nation, underestimating not capabilities but the willingness to use them if necessary. In the context of nuclear proliferation, one can imagine that other nations doubt claims of nuclear capabilities, or that they are uncertain about the willingness of a nation to pursue nuclear brinkmanship under certain circumstances, or that the opponent of the new nuclear power discounts delivery systems, command and control, or some other aspect affecting the veracity of threats. A nascent nuclear nation may feel compelled to press advantages that are not yet accepted by other powers. In doing so, the nuclear state risks a greater likelihood of a military contest. While either a potential attacker or a target can be uncertain about capabilities or resolve, it is much more in the nature of a challenger to be dissatisfied with the status quo. Proliferators are preference outliers. The same incentives that lead nations to seek out nuclear capabilities also encourage attempts to use newly acquired leverage to seek to effect change. Once demands are made, underestimation can lead to bargaining failures and warfare.

#### Controlling the fuel-cycle strengthens tacit bargaining to prohibit war – creates a framework of incentives.

Jan Ruzicka & Nicholas J. Wheeler, 1-18-2010, was appointed as Lecturer in Security Studies at Aberystwyth University, worked in the Department as research assistant for the project ‘The Challenges to Trust-Building in Nuclear Worlds,’ Marie Curie doctoral fellow in the Department, served as the chief aide to a ranking member of the Committee on Foreign Affairs, Defence, and Security of the Senate of the Czech Republic, graduate of Charles University in Prague, he received his MA degrees in politics at Brandeis University and in international relations at Central European University, and Nicholas J. Wheeler is professor of international politics at Aberystwyth University and co-editor of the Cambridge Studies in International Relations book series, published by Cambridge University Press and the British International Studies Association, International Affairs, Vol. 86 Issue 1, p. 79-81, Ebsco Host

The nub of the problem is how to preserve the sovereign right of states to enjoy the peaceful benefits of nuclear energy without practising a new discrimination in fuel-cycle capabilities. 33 For even if those states that have not yet developed enrichment and reprocessing facili-ties could be persuaded to rely on external suppliers of fuel, would those that have already crossed the threshold of ‘virtual’ nuclear weapon status be prepared to give up their national control over the fuel-cycle? Just as the NWS argue that the bomb is vital to their security in an uncertain world, so some states view indigenous fuel-cycle capabilities as an insurance against potential adversaries breaking out of the restraints of the NPT, the fear of those nuclear-armed powers outside the treaty and a generalized collapse of the non-proliferation norm. Establishing international controls over the fuel-cycle is a critical challenge in the years ahead. However, it remains to be seen whether those NNWS that are most critical of the failure of the NWS to live up to their promise to disarm can be persuaded to accept constraints on fuel-cycle capabilities in the absence of what the NNWS see as the NWS acting in good faith to honour their obligations under article VI. Even if this were to lead to global zero, there remains the question whether the current NNWS would accept a global nuclear order that froze them into a permanent inferiority vis-à-vis nuclear suppliers who would also have the ultimate leverage of reconstituting their arsenals. George Perkovich and James Acton are right in recognizing that the issue of ‘nuclear equity’ is a major barrier to a future bargain of this kind. They argue that ‘the most acceptable alternative would be to move towards a standard whereby only multinational facilities were allowed everywhere’. 34 But such an ambitious proposal still leaves unanswered the concerns about hedging both inside and outside the treaty. Movement towards a new and far-reaching bargain might seem to require that one of the parties take a leap of trust by accepting substantially greater vulnerability. 35 This is one of the possibilities, but it is unlikely that governments will act in this manner. There is another possibility, which builds on the fact that the signatories of the NPT have already accepted a significant degree of vulner-ability by entering into the treaty in the first place. This alternative rests on one or both parties taking a series of steps that would strengthen the trusting relationship between the NWS and the NNWS. 36 It is at this point that our reinterpretation of the NPT as embodying a set of trusting relationships opens up new ways to think about nuclear non-proliferation policy. If states realize that they have already entered a trusting relationship with other signatories, the actions required to revitalize the grand bargain do not appear as risky as sceptics might suggest. The new bargain could be defended as advan-tageous in terms of pay-offs for both the NWS and the NNWS, exhibiting the intersection of particular interests and the collective interest in non-proliferation. Notwithstanding the pay-offs providing an incentive to enter into the extended bargain (the rationalist approach to trust), a trusting relationship also requires that all parties have good grounds to think that others will do what is right (the binding approach to trust). Establishing the necessary confidence among the signatories that the bargain can be revitalized in the manner set out above would be significantly helped by all NPT states living up to the promises they have made, by a willingness on the part of all signatories to uphold and enforce the norms on which the treaty stands, and by a recognition that trusting relationships are already in place. Historical legacies, feelings of betrayal on all sides—especially on the part of the NNWS— and questioning of others’ motives and integrity create formidable obstacles to strengthening the trusting relationships. What is crucial is that these obstacles do not rule out the possibility of reversing the erosion of trust in the original bargain of the treaty. The fact that the states that have signed up to the treaty argue over each other’s trustworthiness suggests that there is more space for trust than is generally recognized. The steps that are necessary to build trusting relationships both open up and depend on the possibility of new pay-offs as well as mutual bonds. Building trust among the NWS The lack of progress towards nuclear disarmament on the part of the NWS is probably the most contentious sticking point between the signatories of the NPT. The nuclear-armed powers have at best exercised the ‘radical’ rhetoric of admit-ting that they would consider moving towards nuclear disarmament if only the other members of the nuclear club made the first move. Their behaviour is testa-ment to the present limits of their trusting relationship. Which actions and policies could lead to the extension of these limits? Following the end of the Cold War, the context for thinking about nuclear disarmament changed from the bilateral relationship between the United States and the Soviet Union to a more complex web of relationships between the five recognized nuclear powers. Nevertheless, given the enormous size of their nuclear arsenals, the US and Russia still hold the key to strengthening trusting relation-ships among the NWS and ultimately moving towards nuclear disarmament.

#### Counterplan cards and reprocessing turns don’t apply – brain drain, new capacity.

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Many analysts have characterized aboveboard international civil nuclear cooperation—“Atoms for Peace”—as an unmitigated disaster for the cause of nonproliferation. Most of Atoms for Peace’s dwindling band of supporters themselves no longer contest the idea that it has given dozens of developing countries the technical capacity to build nuclear weapons at a time of their 114 Note that despite Tito’s 1974 decision, Gaukhar Mukhatzhanova finds that Solingen’s argument about the impact of liberalizing political coalition interests on regimes’ nuclear intentions generally fits the Yugoslav case pretty well. See Mukhatzhanova, “Nuclear Weapons in the Balkans,” esp. 213–15. choosing. Even such routine practices as the holding of international confer-ences and student exchange programs in the fields of nuclear science and engineering have come under fire. In contrast to these general trends in the literature, this article has offered a more nuanced assessment of the effects of Atoms for Peace. The literature needs to abandon its outdated, oversimplified, techno-centric approach to the supply side of the proliferation equation. When we recognize that “tech-nical” capacity has political foundations, the effects of Atoms for Peace on states’ nuclear weapons capacity appear much different than the literature suggests. In particular, by changing the career opportunities available to the most talented and energetic among the small pool of competent scientific workers in developing country contexts, Atoms for Peace makes their choice for loyalty more complicated, their choice for voice less dangerous, and their choice for exit more feasible. Thus, Atoms for Peace can substantially retard or even reverse the growth of technical capacity to build the bomb, despite the transfer of hardware and know-how that it promotes. The case study of Yugoslavia has substantiated the theorized nonproliferation-promoting effects of Atoms for Peace, even during the pol-icy’s most “na¨ıve” nuclear promotion days of the 1950s and 1960s. As Yu-goslavia represents a hard test for the theory presented here, the findings from this study should be given special heed. We should not be surprised that Atoms for Peace ended up undercutting the Tito regime’s nuclear ambi-tions through such mechanisms as brain drain, since similar findings abound in the broader literature on international technology transfer, with which the proliferation literature needs to engage deeply. This article is not claiming that Atoms for Peace was a silver bullet for nonproliferation in the case of Yugoslavia. Rather, the claim is that over the long run Atoms for Peace intensified and locked in the Yugoslav nuclear program’s poor organizational performance, and accelerated the program’s ultimate collapse. Some readers might be tempted to conclude that since poor organization and management were the root causes of Yugoslavia’s nuclear woes, therefore the effects of Atoms for Peace were superfluous to the outcome. However, it would be wrong to ignore the Atoms for Peace variable simply because it did not singlehandedly prevent a Yugoslav nuclear bomb from coming into being. Recall that up until now, the literature has generally contended that Atoms for Peace helps states leapfrog over their or-ganizational and resource limitations by handing them ready-made solutions to difficult technical problems. So it would already be a significant finding simply to show that Atoms for Peace, even in its heyday in the 1950s and 1960s, actually did not allow them to leapfrog those limitations. But in fact my finding is that Atoms for Peace greatly compounded those limitations, at least in the case of Yugoslavia. My finding turns standard thinking about this question on its head. This finding is not just interestingly counterintu-itive; it also has important implications for United States and international nonproliferation policy. Typical nonproliferation measures, such as export controls and technical safeguards, can hope to achieve little more than to re-strain nuclear programs from moving forward; but I have shown that Atoms for Peace, especially by stimulating the brain drain, ultimately caused the Yu-goslav nuclear program to stumble backward, and made it next to impossible for Belgrade to turn things around. I should also underscore that this article is not claiming that Yugoslavia’s experience with Atoms for Peace necessarily generalizes to every developing country. Some developing countries have been able to leverage civil nuclear cooperation to achieve nuclear weapons more quickly than they otherwise could have. India is often mentioned as a prime example of the danger that Atoms for Peace will unwittingly provide atoms for war. But this article’s focus on Yugoslavia represents a necessary corrective to the literature’s typ-ical focus on proliferation headline-makers like India. Moreover, there are good theoretical reasons to think that the Yugoslav nuclear experience with Atoms for Peace may have been much more typical for developing countries than the Indian experience. First, as noted earlier in the article, the brain drain literature has singled out India as one of the handful of developing countries where the size and quality of the science and technology com-munity are enough to allow it to absorb the hit of a substantial brain drain and yet still benefit through such compensating mechanisms as brain circu-lation, brain diaspora, and brain replacement. 121 Second, the literature on state capacity suggests that the bureaucratic “steel frame” inherited from the British colonial Indian Civil Service, though surely not problem-free, places India far above most other developing countries in terms of its level of state institutionalization. 122 Reflecting these general bureaucratic strengths of the Indian state, the Indian nuclear program was—despite some hiccups—quite well-organized and managed, and this substantially reduced the potential for India’s participation in Atoms for Peace to cause it serious damage. 123 In short, India appears deductively to be a much more exceptional case in the developing world than Yugoslavia, although more in-depth case studies will be necessary before we can say for sure if Yugoslavia’s experience with Atoms for Peace was truly typical or not. 124 121 An anonymous reviewer of this article suggested that we should consider whether, contrary to the general presumption of the proliferation literature, proliferant states often pare back their international civil nuclear cooperation efforts in order to avoid creating complications for their nuclear weapons Proliferation Implications of Civil Nuclear Cooperation 103 It might be that even if Yugoslavia’s experience was typical for its time period, a reenergized Atoms for Peace policy would not have the same nonproliferation-promoting consequences in today’s changed circumstances. But it is also possible to argue that an expanded commitment to overt interna-tional civil nuclear cooperation would have even stronger nonproliferation-promoting consequences in today’s world. After all, the brain drain from the developing world (and post-Communist states) continues to be a major social fact in the contemporary international system. Although the United States demand for the services of developing-world scientists and engineers was already quite high during the 1950s and 1960s, it has become absolutely voracious in recent years. Between 1978 and 2008, the number of U.S. PhD recipients holding temporary visas jumped from 3,475 (11 percent of the total number of doctorates granted by American universities) to 15,246 (31 percent of the total). In the physical sciences, the increase was from 653 (16 percent) to 3,678 (45 percent). In engineering, the increase was from 781 (32 percent) to 4,486 (57 percent). Of these newly minted temporary visa-holding PhDs, in 2008 73.5 percent reported the intention to remain in the United States; this number was generally much higher among those PhDs who had come from developing and post-Communist countries. Meanwhile, the out-migration of the highly skilled is having dramatic consequences on the resource base of sending countries: for instance, 41 percent of all tertiary-educated Caribbeans have emigrated to developed countries; for West Africa the figure is 27 percent; and for East Africa it is 18.4 percent. 125 This mas-sive brain drain is nothing to celebrate; it has caused major social ills in the developing world. But as an empirical matter brain drain is correlated with reduced technological potential, and when it comes to the narrow question of nuclear weapons development, reducing developing countries’ techno-logical potential is not necessarily a bad thing. One could try to turn this argument around and contend that since the brain drain has become so massive, state policies can do little to encourage or discourage it anymore. But in fact the brain drain still depends crucially on facilitative state policies, especially those of the United States and other receiving countries. 126 In the nuclear area in particular, there is no guarantee that those facilitative policies will continue. As noted at the outset of this article, nonproliferation concerns have led the United States to reduce sub-stantially the scope of its international civil nuclear cooperation programs over the past decades, and some nonproliferation advocates want to abolish them altogether.

#### GNEP/IFNEC is faltering - without U.S. leadership in advanced reprocessing technologies - proliferation from the collapsing IFNEC framework will be rampant.

Tim Gitzel, July 2012, senior vice-president and chief operating officer and was appointed president, President and CEO of Cameco, extensive experience in Canadian and international uranium mining activities, executive vice-president, mining business unit for AREVA, College of Law at the University of Saskatchewan, serves as vice-chair on both the Mining Association of Canada and the Canadian Nuclear Association boards of directors, past president of the Saskatchewan Mining Association, and has served on the boards of Sask Energy, co-chair of the Royal Care campaign, a recipient of the Centennial Medal, World Nuclear Association (WNA), “International Framework for Nuclear Energy Cooperation (formerly Global Nuclear Energy Partnership),” <http://www.world-nuclear.org/info/inf117_international_framework_nuclear_energy_cooperation.html>

The International Framework for Nuclear Energy Cooperation (IFNEC), formerly the Global Nuclear Energy Partnership (GNEP), aims to accelerate the development and deployment of advanced nuclear fuel cycle technologies while providing greater disincentives to the proliferation of nuclear weapons. GNEP was initiated by the USA early in 2006, but picked up on concerns and proposals from the International Atomic Energy Agency (IAEA) and Russia. The vision was for a global network of nuclear fuel cycle facilities all under IAEA control or at least supervision. Domestically in the USA, the Global Nuclear Energy Partnership (GNEP) was based on the Advanced Fuel Cycle Initiative (AFCI), and while GNEP faltered with the advent of the Barack Obama administration in Washington from 2008, the AFCI is being funded at higher levels than before for R&D "on proliferation-resistant fuel cycles and waste reduction strategies." Two significant new elements in the strategy are new reprocessing technologies which separate all transuranic elements together (and not plutonium on its own), and advanced burner (fast) reactors to consume the result of this while generating power. GNEP was set up as both a research and technology development initiative and an international policy initiative. It addresses the questions of how to use sensitive technologies responsibly in a way that protects global security, and also how to manage and recycle wastes more effectively and securely. The USA had a policy in place since 1977 which ruled out reprocessing used fuel, on non-proliferation grounds. Under GNEP, reprocessing is to be a means of avoiding proliferation, as well as addressing problems concerning high-level wastes. Accordingly, the US Department of Energy set out to develop advanced fuel cycle technologies on a commercial scale. As more countries consider nuclear power, it is important that they develop the infrastructure capabilities necessary for such an undertaking. As with GNEP, IFNEC partners are working with the IAEA to provide guidance for assessing countries' infrastructure needs and for helping to meet those needs. For countries that have no existing nuclear power infrastructure, IFNEC partners can share knowledge and experience to enable developing countries to make informed policy decisions on whether, when, and how to pursue nuclear power without any need to establish sensitive fuel cycle facilities themselves. With the USA taking a lower profile in GNEP from 2009, the partners are focused on collaboration to make nuclear energy more widely accessible in accordance with safety, security and non-proliferation objectives, as an effective measure to counter global warming, and to improve global energy security. A change of name to International Framework for Nuclear Energy Cooperation was adopted in June 2010, along with a new draft vision statement, which read: "The Framework provides a forum for cooperation among participating states to explore mutually beneficial approaches to ensure the use of nuclear energy for peaceful purposes proceeds in a manner that is efficient, safe, secure, and supports non-proliferation and safeguards." By some accounts, this envisages "cradle to grave" fuel management as central, along with assurance of fuel supply. IFNEC agenda Broadly, IFNEC's mission is the global expansion of nuclear power in a safe and secure manner. A major rationale is reducing the threat of proliferation of nuclear materials and the spread of sensitive nuclear technology for non-peaceful purposes. With greater use of nuclear energy worldwide the possibility of the spread of nuclear material and technology for the development of weapons of mass destruction must be countered to avoid increasing the present threat to global security. A second issue addressed by IFNEC is the efficiency of the current nuclear fuel cycle. The USA, the largest producer of nuclear power, has employed a 'once through' fuel cycle. This practice only uses a part of the potential energy in the fuel, while effectively wasting substantial amounts of useable energy that could be tapped through recycling. The remaining fissionable material can be used to create additional power, rather than treating it as waste requiring long-term storage. Others, notably Europe and Japan, recover the residual uranium and plutonium from the used fuel to recycle at least the plutonium in light water reactors. However, no-one has yet employed a comprehensive technology that includes full actinidea recycle. In the USA, this question is pressing since significant amounts of used nuclear fuel are stored in different locations around the country awaiting shipment to a planned geological repository which was to be at Yucca Mountain in Nevada. This project is delayed, and in any case will fill very rapidly if it is used simply for used fuel rather than the separated wastes after reprocessing it. IFNEC also aims to address cost issues associated with the development and expansion of nuclear power in developing countries. Nuclear programs require a high degree of technical and industrial expertise. This is a serious obstacle for emerging countries attempting to develop nuclear power, although efforts are underway to increase the number of indigenously-trained nuclear experts through a variety of education and training initiatives. Internationally, the countries identified by the US Department of Energy (DOE) as likely participants at both enrichment and recycling ends are the USA, UK, France, Russia and Japan. The USA and Japan agreed to develop a nuclear energy cooperation plan centered on GNEP and the construction of new nuclear power plants. (Japan also intended to participate in the DOE's FutureGen clean coal project, which was abandoned but may possibly be revived.) Several bilateral agreements centered on GNEP/IFNEC have been developed. IFNEC parties and rationale At the first ministerial meeting in May 2007, the USA, China, France, Japan and Russia became formally the founding members of GNEP. Four of the five are nuclear weapons states and have developed full fuel cycle facilities arising from that; the non-nuclear weapons state, Japan, has developed similar facilities to support its extensive nuclear power program. To date, 31 nationsb are participants in IFNEC. Most of these signed the GNEP Statement of Principles1, which established broad guidelines for participation and incorporates seven objectives that touch on each element of GNEP. Under GNEP, so-called 'fuel cycle nations' would provide assured supplies of enriched nuclear fuel to client nations, which would generate electricity before returning the used fuel. The used fuel would then undergo advanced reprocessing so that the uranium and plutonium it contained, plus long-lived minor actinides, could be recycled in advanced nuclear power reactors. Waste volumes and radiological longevity would be greatly reduced by this process, and the wastes would end up either in the fuel cycle or user countries. Nuclear materials would never be outside the strictest controls, overseen by the IAEA. Two sensitive processes in particular would not need to be employed in most countries: enrichment and reprocessing. The limitation on these, by commercial dissuasion rather than outright prohibition, is at the heart of GNEP strategy. A corollary of this dissuasion is that GNEP/IFNEC member nations would be assured of reliable and economic fuel supply under some IAEA arrangement yet to be specified. GNEP/IFNEC work plan The GNEP members set up two principal working groups: The reliable nuclear fuel services working group (RNFS WG) is addressing nuclear fuel leasing and other considerations around comprehensive nuclear fuel supply goals, and includes evaluation of back-end fuel cycle options. The nuclear infrastructure development working group (ID WG) is addressing human resource development, radioactive waste management, small modular reactors, financing options, engagement with specialist organizations and identifying infrastructure requirements for an international nuclear fuel services framework enabling nuclear power deployment in many countries. An early priority was seen to be the development of new reprocessing technologies to enable recycling of most of the used fuel. One of the concerns when reprocessing used nuclear fuel is ensuring that separated fissile material is not used to create a weapon. One chemical reprocessing technology – PUREX – has been employed for over half a century, having been developed in wartime for military use (see page on Processing of Used Nuclear Fuel). This has resulted in the accumulation of 240 tonnes of separated reactor-grade plutonium around the world (though some has been used in the fabrication of mixed oxide fuel). While this is not suitable for weapons use, it is still regarded as a proliferation concern. New reprocessing technologies are designed to combine the plutonium with some uranium and possibly with minor actinides (neptunium, americium and curium), rendering it impractical to use the plutonium in the manufacture of weapons. GNEP/IFNEC creates a framework where states that currently employ reprocessing technologies can collaborate to design and deploy advanced separations and fuel fabrication techniques that do not result in the accumulation of separated pure plutonium. Several developments of PUREX which fit the GNEP/IFNEC concept are being trialled: NUEX separates uranium and then all transuranics (including plutonium) together, with fission products separately (USA). UREX+ separates uranium and then either all transuranics together or simply neptunium with the plutonium, with fission products separately (USA). COEX separates uranium and plutonium (and possibly neptunium) together as well as a pure uranium stream, leaving other minor actinides with the fission products. A variation of this separates americium and curium from the fission products (France). GANEX separates uranium and plutonium as in COEX, then separates the minor actinides plus some lanthanides from the short-lived fission products (France). The central feature of all these variants is to keep the plutonium either with some uranium or with other transuranics which can be destroyed by burning in a fast neutron reactor – the plutonium being the main fuel constituent. Trials of some fuels arising from UREX+ reprocessing in USA are being undertaken in the French Phenix fast reactor. An associated need is to develop the required fuel fabrication plant. That for plutonium with only some uranium and neptunium is relatively straightforward and similar to today's MOX fuel fabrication plants. A plant for fuel including americium and curium would be more complex (due to americium being volatile and curium a neutron emitter). The second main technological development originally envisaged under GNEP is the advanced recycling reactor – basically a fast reactor capable of burning minor actinides. Thus used fuel from light water reactors would be transported to a recycling centre, where it would be reprocessed and the transuranic product (including plutonium) transferred to a fast reactor on site. This reactor, which would destroy the actinides, would have a power capacity of perhaps 1000 MWe. The areas of development for fast reactor technology centre on the need for fast reactors to be cost competitive with current light water reactors. Countries such as France, Russia and Japan have experience in the design and operation of fast reactors and the USA is working with them to accelerate the development of advanced fast reactors that are cost competitive, incorporate advanced safeguards features, and are efficient and reliable. The advent of such fast reactors would mean that reprocessing technology could and should step from the aqueous processes derived from PUREX described above to electrometallurgical processes in a molten salt bath. Separating the actinides then is by electrodeposition on a cathode, without chemical separation of heavy elements as occurs in the Purex and related processes. This cathode product can then be used in a fast reactor, since it is not sensitive to small amounts of impurities. GE Hitachi Nuclear Energy (GEH) is developing this 'Advanced Recycling Center' concept which combines electrometallurgical separation and burning the final product in one or more of its PRISM fast reactors on the same site.2 The separation process would remove uranium, which is recycled to light water reactors; then fission products, which are waste; and finally the actinides including plutonium. With respect to the ultimate disposition of nuclear waste from recycling, three options exist conceptually: User responsibility. The radioactive wastes from the nuclear fuel recycling centre could be considered as processed waste belonging to the user nation that sent its used nuclear fuel to the recycling centre. These wastes might then be shipped back to that user nation for final disposal. Supplier responsibility. The nation hosting the recycling centre might retain the waste or, if a different supplier nation had manufactured the original fuel, all wastes arising from the original fuel could be considered the responsibility of that fuel supplier nation. Third-party responsibility. A disposal facility might be sited in a country that is, in particular cases, neither the supplier nor the user, but is using its technological capability and geological suitability to manage the safe delivery of a commercially and environmentally valuable service. The IFNEC program is considering the ownership and final disposal of waste, but this discussion has not yet reached beyond the preliminary stages. The second and third conceptual options for waste disposal would require one or more international radioactive waste final disposal facilities (see page on International Nuclear Waste Disposal Concepts), and serious discussion of those options will begin only when nations enter into real consideration of the sensitive issue of the hosting of such facilities. In 2012 the RNFS WG is working on a paper entitled ‘Comprehensive Fuel Services: Strategies for the Back End of the Fuel Cycle’ to pursue agreement on the basis for international cooperation on repositories and reprocessing for these activities to be commercialised. Finally, IFNEC is concerned to foster the development of 'grid-appropriate reactors', i.e. smaller units (perhaps 50-350 MWe) for electricity grids of up to 3 GWe. These should incorporate advanced features including safety, simplicity of operation, long-life fuel loads, intrinsic proliferation-resistance and security3. In January 2007, the US Department of Energy (DOE) announced a new strategic plan for GNEP initiatives, including preparation of an environmental impact statement. It would assess three facilities: a fuel recycling centre including reprocessing and fuel fabrication plants; a fast reactor to burn the actinide-based fuel and transmute transuranic elements; and an advanced fuel cycle research facility. The DOE envisaged the first two being industry-led initiatives. In October 2007, the DOE awarded $16 million to four industry consortia for GNEP-related studies. The largest share of this, $5.6 million, went to the International Nuclear Recycling Alliance (INRA) led by Areva and including Mitsubishi Heavy Industries (MHI), Japan Nuclear Fuel Ltd (JNFL), Battelle, BWX Technologies and Washington Group International. INRA was contracted to provide three major studies: technology development roadmaps analyzing the technology needed to achieve GNEP goals; business plans for the development and commercialization of the advanced GNEP technologies and facilities; and conceptual design studies for the fuel recycling centre and advanced recycling reactor. Areva and JNFL are focused on the Consolidated Fuel Treatment Center, a reprocessing plant (which will not separate pure plutonium), and MHI on the Advanced Recycling Reactor, a fast reactor which will burn actinides with uranium and plutonium. These are the two main technological innovations involved with GNEP. In this connection MHI has also set up Mitsubishi FBR Systems (MFBR). INRA appears to have materialized out of a September 2007 agreement between Areva and JNFL to collaborate on reprocessing. Its contract with the DOE was extended in April 2008. A significant setback for the US leadership of GNEP was related to funding by Congress. For FY 2007 the program – including some specifically US aspects – had $167 million, and for FY 2008 Congress cut it back to $120 million, severely constraining the fuel cycle developments. For FY 2009, GNEP did not receive any funding although $120 million was allocated to the Advanced Fuel Cycle Initiative (AFCI), which funds research into reprocessing technologies. The funding for AFCI was only about 40% of the amount requested by the administration. Thus in the USA, GNEP has been largely reduced to an R&D program on advanced fuel cycle technologies. In June 2009, the DOE cancelled the programmatic environmental impact statement for GNEP "because it is no longer pursuing domestic commercial reprocessing, which was the primary focus of the prior Administration's domestic GNEP program."4 Outcomes of IFNEC Under any scenario, the USA and others will require waste repositories; however, recycling used fuel will greatly reduce the amount of waste destined for disposal. For the planned US repository at Yucca Mountain in Nevada, the reprocessing-recycling approach with burning of actinides and perhaps also some long-lived fission products would mean that the effective capacity of such a repository would be increased by a factor of 50 or more. This is due to decreased radiotoxicity and heat loads, as well as reducing greatly the ultimate volume of waste requiring disposal. IFNEC envisages the development of comprehensive fuel services, including such options as fuel leasing, to begin addressing the challenges of reliable fuel supply while maximizing non-proliferation benefits. The establishment of comprehensive and reliable fuel services, including used fuel disposition options, will create a more practical approach to nuclear power for nations seeking its benefits without the need to establish indigenous fuel cycle facilities. It is through enabling such a comprehensive framework that IFNEC will possibly make its primary contribution to reducing proliferation risk.

#### The plan would cause quick U.S.-Russia PRISM commercialization and fissile material oversight.

Tom Blees, 6-4-2011, is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate,”Disposal of UK plutonium stocks with a climate change focus,” <http://bravenewclimate.com/2011/06/04/uk-pu-cc/>

While the scientists and engineers were perfecting the many revolutionary features of the IFR at the EBR-II site in the Eighties and early Nineties, a consortium of major American firms collaborated with them to design a commercial-scale fast reactor based on that research. General Electric led that group, which included companies like Bechtel, Raytheon and Westinghouse, among others. The result was a modular reactor design intended for mass production in factories, called the PRISM (Power Reactor Innovative Small Module). A later iteration, the S-PRISM, would be slightly larger at about 300 MWe, while still retaining the features of the somewhat smaller PRISM. For purposes of simplicity I will refer hereinafter to the S-PRISM as simply the PRISM. After the closure of the IFR project, GE continued to refine the PRISM design and is in a position to pursue the building of these advanced reactors as soon as the necessary political will can be found. Unfortunately for those who would like to see America’s fast reactor be built in America, nuclear politics in the USA is nearly as dysfunctional as it is in Germany. The incident at Fukushima has only made matters worse. The suggestion in this report that fast reactors are thirty years away is far from accurate. GE-Hitachi plans to submit the PRISM design to the Nuclear Regulatory Commission (NRC) next year for certification. But that time-consuming process, while certainly not taking thirty years, may well be in process even as the first PRISM is built in another country. This is far from unprecedented. In the early Nineties, GE submitted its Advanced Boiling Water Reactor (ABWR) design to the NRC for certification. GE then approached Toshiba and Hitachi and arranged for each of those companies to build one in Japan. Those two companies proceeded to get the design approved by their own NRC counterpart, built the first two ABWRs in just 36 and 39 months, fueled and tested them, then operated them for a year before the NRC in the US finally certified the design. International partners On March 24th an event was held at the Russian embassy in Washington, D.C., attended by a small number of members of the nuclear industry and its regulatory agencies, both foreign and domestic, as well as representatives of NGOs concerned with nuclear issues. Sergei Kirienko, the director-general of Rosatom, Russia’s nuclear power agency, was joined by Dan Poneman, the deputy secretary of the U.S. Dept. of Energy. This was shortly after the Fukushima earthquake and tsunami, at a time when the nuclear power reactors at Fukushima Daiichi were still in a very uncertain condition. Mr. Kirienko and Mr. Poneman first spoke about the ways in which the USA and Russia have been cooperating in tightening control over fissile material around the world. Then Mr. Kirienko addressed what was on the minds of all of us: the situation in Japan and what that portends for nuclear power deployment in the USA and around the world. He rightly pointed out that the Chernobyl accident almost exactly 25 years ago, and the Fukushima problems now, clearly demonstrate that nuclear power transcends national boundaries, for any major accident can quickly become an international problem. For this reason Kirienko proposed that an international body be organized that would oversee nuclear power development around the world, not just in terms of monitoring fissile material for purposes of preventing proliferation (much as the IAEA does today), but to bring international expertise and oversight to bear on the construction and operation of nuclear power plants as these systems begin to be built in ever more countries. Kirienko also pointed out that the power plants at risk in Japan were old reactor designs. He said that this accident demonstrates the need to move nuclear power into the modern age. For this reason, he said, Russia is committed to the rapid development and deployment of metal-fueled fast neutron reactor systems. His ensuing remarks specifically reiterated not only a fast reactor program (where he might have been expected to speak about Gen III or III+ light water reactor systems), but the development of metal fuel for these systems. This is precisely the technology that was developed at Argonne National Laboratory with the Integral Fast Reactor (IFR) program, but then prematurely terminated in 1994 in its final stages. For the past two years I’ve been working with Dr. Evgeny Velikhov (director of Russia’s Kurchatov Institute and probably Russia’s leading scientist/political advisor) to develop a partnership between the USA and Russia to build metal-fueled fast reactors; or to be more precise, to facilitate a cooperative effort between GE-Hitachi and Rosatom to build the first PRISM reactor in Russia as soon as possible. During those two years there have been several meetings in Washington to put the pieces in place for such a bilateral agreement. The Obama administration, at several levels, seems to be willingly participating in and even encouraging this effort. Dr Evgeny Velikhov, SCGI member Dr. Velikhov and I (and other members of the Science Council for Global Initiatives) have also been discussing the idea of including nuclear engineers from other countries in this project, countries which have expressed a desire to obtain or develop this technology, some of which have active R&D programs underway (India, South Korea, China). Japan was very interested in this technology during the years of the IFR project, and although their fast reactor development is currently focused on their oxide-fueled Monju reactor there is little doubt that they would jump at the chance to participate in this project. Dr. Velikhov has long been an advocate of international cooperation in advanced nuclear power research, having launched the ITER project about a quarter-century ago. He fully comprehends the impact that international standardization and deployment of IFR-type reactors would have on the well-being of humanity at large. Yet if Russia and the USA were to embark upon a project to build the first PRISM reactor(s) in Russia, one might presume that the Russians would prefer to make it a bilateral project that would put them at the cutting edge of this technology and open up golden opportunities to develop an industry to export it. It was thus somewhat surprising when Mr. Kirienko, in response to a question from one of the attendees, said that Russia would be open to inviting Japan, South Korea and India to participate in the project. One might well question whether his failure to include China in this statement was merely an oversight or whether that nation’s notorious reputation for economic competition often based on reverse-engineering new technologies was the reason. I took the opportunity, in the short Q&A session, to point out to Mr. Poneman that the Science Council for Global Initiatives includes not just Dr. Velikhov but most of the main players in the development of the IFR, and that our organization would be happy to act as a coordinating body to assure that our Russian friends will have the benefit of our most experienced scientists in the pursuit of this project. Mr. Poneman expressed his gratitude for this information and assured the audience that the USA would certainly want to make sure that our Russian colleagues had access to our best and brightest specialists in this field. Enter the United Kingdom Sergei Kirienko was very clear in his emphasis on rapid construction and deployment of fast reactors. If the United States moves ahead with supporting a GE-Rosatom partnership, the first PRISM reactor could well be built within the space of the next five years. The estimated cost of the project will be in the range of three to four billion dollars (USD), since it will be the first of its kind. The more international partners share in this project, the less will be the cost for each, of course. And future copies of the PRISM have been estimated by GE-Hitachi to cost in the range of $1,700/kW. Work is under way on gram samples of civil plutonium According to this consultation document, the UK is looking at spending £5-6 billion or more in dealing with its plutonium. Yet if the plutonium were to simply be secured as it currently is for a short time longer and the UK involved itself in the USA/Russia project, the cost would be a small fraction of that amount, and when the project is completed the UK will have the technology in hand to begin mass-production of PRISM reactors. The plutonium stocks of the UK could be converted into metal fuel using the pyroprocessing techniques developed by the IFR project (and which, as noted above, are ready to be utilized by South Korea). The Science Council for Global Initiatives is currently working on arranging for the building of the first commercial-scale facility in the USA for conversion of spent LWR fuel into metal fuel for fast reactors. By the time the first PRISM is finished in Russia, that project will also likely be complete. What this would mean for the UK would be that its stores of plutonium would become the fast reactor fuel envisioned by earlier policymakers. After a couple years in the reactor the spent fuel would be ready for recycling via pyroprocessing, then either stored for future use or used to start up even more PRISM reactors. In this way not only would the plutonium be used up but the UK would painlessly transition to fast reactors, obviating any need for future mining or enrichment of uranium for centuries, since once the plutonium is used up the current inventories of depleted uranium could be used as fuel. Conclusion Far from being decades away, a fully-developed fast reactor design is ready to be built. While I’m quite certain that GE-Hitachi would be happy to sell a PRISM to the UK, the cost and risk could be reduced to an absolute minimum by the happy expedient of joining in the international project with the USA, Russia, and whichever other nations are ultimately involved. The Science Council for Global Initiatives will continue to play a role in this project and would be happy to engage the UK government in initial discussions to further explore this possibility. There is little doubt that Russia will move forward with fast reactor construction and deployment in the very near future, even if the PRISM project runs into an unforeseen roadblock. It would be in the best interests of all of us to cooperate in this effort. Not only will the deployment of a standardized modular fast reactor design facilitate the disposition of plutonium that is currently the driving force for the UK, but it would enable every nation on the planet to avail itself of virtually unlimited clean energy. Such an international cooperative effort would also provide the rationale for the sort of multinational nuclear power oversight agency envisioned by Mr. Kirienko and others who are concerned not only about providing abundant energy but also in maintaining control over fissile materials.

#### Russian nuclear security is a joke spent nuclear fuel is highly vulnerable to terrorist theft – cited means and motivation.

Stephen Menesick, Summer 2011, Political Science and Peace, War and Defense, public policy analysis, Unviersity of Chapel Hill, Global Security Studies, Vol. 2 Issue 3, “ Preventing the Unthinkable: An Overview of Threats, Risks, and US Policy Response to Nuclear Terrorism,” p. 5-6, <http://globalsecuritystudies.com/Menesick%20Nuclear%20Final.pdf>

The outlook in Russia is bleaker. After the Cold War, many Russian nuclear weapons were extremely vulnerable—left nearly unsecured across the country. Since then, the Russian government has made a considerable effort to strengthen security and upgrade technology that guards nuclear weapons and material (Bunn, 2006). However, significant risks still remain. Because of the sheer quantity of weapons in Russia, and the difficulty of managing such a large number of weapons, external risks of outright theft are always a concern. Reports by Russian officials have confirmed that terrorists have conducted intelligence gathering operations on Russian stockpiles, and to date, it is the only country where documentation of terrorist surveillance exists (Bunn 2010, 35). Equipping all sites with state of the art security measures has been a difficult challenge. The Russian government, and consequently the security contractors who are responsible for the upkeep of these facilities, suffers from a lack of financial resources (Joyner & Parkhouse 2009, 215). Additionally, significant internal threats are present. Because the government employs independent security companies to coordinate much of management of nuclear materials, there are two channels for insiders to aid terrorist groups—high level government officials and low level technical personnel. Both groups have incentive to divulge information at the right price, and Russia has a political environment that has been rife with corruption for decades (Bunn 2010, 32-33 and Joyner & Parkhouse 2009, 216). Finally, there is the security risk of Highly Enriched Uranium-fueled reactors (HEU’s). Because of its chemical composition and refinement, HEU can be used easily to make crude nuclear weapons even by non-experts (Norwegian Project Secretariat). Because of the ease with which a weapon can be made out of HEU, it is easy to see why terrorist acquisition is a direct security risk. As of 2009, about half of the 200 remaining reactors were still using HEU fuel, and do not have capability to be converted to lower enriched uranium (LEU) (World Nuclear Association 2011). Most of these are in Russia, where the government has invested little in research to convert their own reactors to LEU power or other alternatives (World Nuclear Association 2011). Further, and most alarming, is that the security at many of these HEU sites is inadequate to prevent theft of HEU, making research reactors a prime target for terrorists seeking to obtain nuclear material (Bunn, 2010, 45). If a terrorist group only acquires nuclear material, and not a functional weapon, they will have to successfully create a weapon that they can detonate. Unfortunately, this is an achievable end that can be done with little resources or expertise. As discussed above, Highly Enriched Uranium is pure enough that it can be made into a devastating weapon relatively easily, and it is also the most likely nuclear material that terrorists would get their hands on. The perception of modern nuclear weapons may be that they are highly technical instruments of warfare backed by complex science. While this may be true, a “crude” nuclear weapon, one that takes little skill to create, would still be incredibly deadly—capable of destroying the downtown of a major city (Bunn, 2010, 16). The process of building a weapon of this type is not entirely simple, and anyone who wanted to construct such a device would need a technical team with at least some experience. However, in comparison to the nuclear weapons manufactured today, a crude bomb would be a more feasible project, as it would not have to comply with rigorous military and safety specifications. Thus, it is plausible to see that this kind of power is not out of reach for dedicated terrorist groups, should they acquire nuclear material (Ferguson & Potter 2003, 116). Having acquired nuclear material and created a weapon, the final obstacle a terrorist group would need to pass would be delivery and detonation in the target location. Likely, this would involve them smuggling a bomb or device into the United States, and then into a major city, undetected. Nuclear material is quite difficult to track, especially the small amounts that would be needed for a crude weapon (Bunn 2010, 18). Journalists have repeatedly demonstrated the ease with which radioactive materials can be transported and shielded from detection while traveling (Ferguson & Potter 2003, 141). Even with the most advanced technology, HEU is among the most difficult kind of radiological material to detect (Montgomery 2009, 79). Also, terrorists could use existing port and transport systems in place, as they are relatively unsecure. Customs and Border Patrol inspects only around 6% of cargo containers entering the US (Medalia 2005). Even with increased security measures and Port Authority reorganization in 2003, there are still plausible scenarios for terrorist groups sneaking radioactive materials into the US via boat undetected (Ferguson & Potter 2003, 300). Furthermore, terrorists could avoid this obstacle entirely by taking materials that were already inside the US. Once inside the US, delivery and detonation to target site would also not be insurmountable. As Matthew Bunn and E. P. Maslin write: The length of national borders, the diversity of means of transport, the vast scale of legitimate traffic across borders, and the ease of shielding the radiation from plutonium or especially from HEU all operate in favor of the terrorists. Building the overall system of legal infrastructure, intelligence, law enforcement, border and customs forces, and radiation detectors needed to find and recover stolen nuclear weapons or materials, or to interdict these as they crossnational borders, is an extraordinarily difficult challenge. (Bun & Maslin 2010) In order for a terrorist group to be “successful” in carrying out a nuclear attack, many elements must come together. There is no doubt that the end result of a nuclear terrorist attack would be terrible, so even with a low probability of attack, the high impact possibility means steps should still be taken to prevent it. In each link of the chain of attack, there are security measures that have been put in place, and continue to be upgraded. However, as discussed above, there are still vulnerabilities in each step of the process that, if they all were orchestrated together, terrorists could exploit to pull off an attack with a nuclear weapon. The most critical of these links is acquisition of a bomb or nuclear material, because it is the only one that truly prevents an attack from occurring. Once a terrorist group has nuclear material, they can find people willing to make it into a usable weapon if they cannot themselves.

#### Causes retaliation and global nuclear war – only the plan solves.

Patrick F. Speice, Jr., Feburary 2006, is an associate in Gibson, Dunn & Crutcher's Washington, D.C. office, works in the firm’s International Trade Regulation and Compliance Department, focusing on export controls, foreign regulations, and economic sanctions, earned his J.D. in 2006 from the Marshall-Wythe School of Law at the College of William & Mary, William and Mary Research Fellowpolitical science, Wake Forest University, authored or co-authored professional articles, includes representation of clients in Foreign Corrupt Practices matters and securities investigations, “Negligence and Nuclear Nonproliferation,” William & Mary Law Review, Lexis Nexis

Accordingly, there is a significant and ever-present risk that terrorists could acquire a nuclear device or fissile material from Russia as a result of the confluence of Russian economic decline and the end of stringent Soviet-era nuclear security measures. 39 Terrorist groups could acquire a nuclear weapon by a number of methods, including "steal[ing] one intact from the stockpile of a country possessing such weapons, or ... [being] sold or given one by [\*1438] such a country, or [buying or stealing] one from another subnational group that had obtained it in one of these ways." 40 Equally threatening, however, is the risk that terrorists will steal or purchase fissile material and construct a nuclear device on their own. Very little material is necessary to construct a highly destructive nuclear weapon. 41 Although nuclear devices are extraordinarily complex, the technical barriers to constructing a workable weapon are not significant. 42 Moreover, the sheer number of methods that could be used to deliver a nuclear device into the United States makes it incredibly likely that terrorists could successfully employ a nuclear weapon once it was built. 43 Accordingly, supply-side controls that are aimed at preventing terrorists from acquiring nuclear material in the first place are the most effective means of countering the risk of nuclear terrorism. 44 Moreover, the end of the Cold War eliminated the rationale for maintaining a large military-industrial complex in Russia, and the nuclear cities were closed. 45 This resulted in at least 35,000 nuclear scientists becoming unemployed in an economy that was collapsing. 46 Although the economy has stabilized somewhat, there [\*1439] are still at least 20,000 former scientists who are unemployed or underpaid and who are too young to retire, 47 raising the chilling prospect that these scientists will be tempted to sell their nuclear knowledge, or steal nuclear material to sell, to states or terrorist organizations with nuclear ambitions. 48 The potential consequences of the unchecked spread of nuclear knowledge and material to terrorist groups that seek to cause mass destruction in the United States are truly horrifying. A terrorist attack with a nuclear weapon would be devastating in terms of immediate human and economic losses. 49 Moreover, there would be immense political pressure in the United States to discover the perpetrators and retaliate with nuclear weapons, massively increasing the number of casualties and potentially triggering a full-scale nuclear conflict. 50 In addition to the threat posed by terrorists, leakage of nuclear knowledge and material from Russia will reduce the barriers that states with nuclear ambitions face and may trigger widespread proliferation of nuclear weapons. 51 This proliferation will increase the risk of nuclear attacks against the United States [\*1440] or its allies by hostile states, 52 as well as increase the likelihood that regional conflicts will draw in the United States and escalate to the use of nuclear weapons. 53

#### By itself terrorism causes extinction.

Owen B. Toon, 4-19-2007, is professor of Atmospheric and Oceanic Sciences and a fellow at the Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado received his Ph.D. from Cornell University, in cloud physics, atmospheric chemistry and radiative transfer, “Atmospheric effects and societal consequences of regional scale nuclear conﬂicts and acts of individual nuclear terrorism,” Atmosphere Chemistry Physics

To an increasing extent, people are congregating in the world’s great urban centers, creating megacities with popula- tions exceeding 10 million individuals. At the same time, ad- vanced technology has designed nuclear explosives of such small size they can be easily transported in a car, small plane or boat to the heart of a city. We demonstrate here that a sin- gle detonation in the 15 kiloton range can produce urban fa- talities approaching one million in some cases, and casualties exceeding one million. Thousands of small weapons still ex- ist in the arsenals of the U.S. and Russia, and there are at least six other countries with substantial nuclear weapons invento- ries. In all, thirty-three countries control sufficient amounts of highly enriched uranium or plutonium to assemble nuclear explosives. A conflict between any of these countries involv- ing 50-100 weapons with yields of 15kt has the potential to create fatalities rivaling those of the Second World War. Moreover, even a single surface nuclear explosion, or an air burst in rainy conditions, in a city center is likely to cause the entire metropolitan area to be abandoned at least for decades owing to infrastructure damage and radioactive contamina- tion. As the aftermath of hurricane Katrina in Louisiana sug- gests, the economic consequences of even a localized nuclear catastrophe would most likely have severe national and inter- national economic consequences. Striking effects result even from relatively small nuclear attacks because low yield det- onations are most effective against city centers where busi- ness and social activity as well as population are concen- trated. Rogue nations and terrorists would be most likely to strike there. Accordingly, an organized attack on the www.atmos-chem-phys.net/7/1973/2007/ Atmos. Chem. Phys., 7, 1973–2002, 2007 Page 28 2000 O. B. Toon et al.: Consequences of regional scale nuclear conflicts U.S. by a small nuclear state, or terrorists supported by such a state, could generate casualties comparable to those once predicted for a full-scale nuclear “counterforce” exchange in a superpower conflict. Remarkably, the estimated quantities of smoke generated by attacks totaling about one megaton of nuclear explosives could lead to significant global climate perturbations (Robock et al., 2007). While we did not ex- tend our casualty and damage predictions to include poten- tial medical, social or economic impacts following the initial explosions, such analyses have been performed in the past for large-scale nuclear war scenarios (Harwell and Hutchin- son, 1985). Such a study should be carried out as well for the present scenarios and physical outcomes.

### 1AC climate advantage

#### ADVANTAGE:\_\_ climate change

#### Solving electricity is the first step to solve climate change because without nuclear power warming is inevitable.

Barry Brook et. al, 2-21-2009, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, George S. Stanford is a nuclear reactor physicist, part of the team that developed the Integral Fast Reactor, PhD from Stanford University in Physics, Masters from University of Virginia in Engineering, worked at Argonne National Laboratory, Graham R.L. Cowan, "Boron: A Better Energy Carrier than Hydrogen?" in 2001, published "How Fire Can Be Tamed," BraveNewClimate, “Response to an Integral Fast Reactor (IFR) critique,” <http://bravenewclimate.com/2009/02/21/response-to-an-integral-fast-reactor-ifr-critique/>

[TB] Almost 80% of greenhouse gas emissions come from nuclear-capable countries anyway, so even if we just deployed them there we could make tremendous strides, though it would still be wise to create some sort of international oversight organization as I propose in the book. [BWB] This is at best grossly disingenuous (not to mention insulting to call Kirsch stupid). You need to solve the electricity carbon problem to fix the vehicular fuels problem, space heating and embedded energy in building and manufactured goods, and Tom has a solution for MSW [municipal solid waste] also. About half of agricultural emissions can also be solved if you have a zero-carbon energy source. Then you just need to worry about the ruminant methane and carbon from deforestation. But the bottom line is, if you fix electricity, everything else will quicktly start to fall into place. If we don’t stop coal in places like China and India, we’re hosed, irrespective of what we might do in the US and Oz (and even if we could do with without advanced nuclear, which we very likely cannot). I do wonder, what is Jim Green’s plan is for replacing the 484 GW of coal-fired power stations already installed in China, and the further 200 or so plants in the planning or construction pipeline?

#### PRISM is needed to now to deal with climate issues – renewables and other fuels fail.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

There is a pressing need to: (a) displace our heavy dependence on fossil fuels with sustainable, low-carbon alternative energy sources over the coming decades to mitigate the environmental damage of energy production and underpin global energy security [17], and (b) demonstrate a credible and acceptable way to safely deal with used nuclear fuel in order to clear a socially acceptable pathway for nuclear fission to be a major low-carbon energy source for this century. Given the enormous technical, logistical and economic challenges of adding carbon capture and storage to coal and gas power plants, we are faced with the necessity of a nearly complete transformation of the world’s energy systems. Objective analyses of the inherent constraints on wind, solar, and other less-mature renewable energy technologies inevitably show that they will fall short of meeting future low-emissions demands. A ‘go slow, do little’ approach to energy policy is not defensible given the urgency of the problems society must address, and the time required for an orderly transition of energy systems at a global scale. As such, SCGI advocates a near-term deployment of the Integral Fast Reactor. What is needed now is a two-pronged approach, for completion by 2020 or earlier, that involves: (i) demonstration of the pyroprocessing of LWR spent oxide fuel, and (ii) construction of a PRISM fast reactor as a prototype demonstration plant, to establish the basis for licensing and the cost and schedule for subsequent fully commercial IFR plants. Once demonstrated, this commercial IFR will be expected to show very significant advances in nuclear safety, reliability, nuclear fuel sustainability, management of long-term waste, proliferation resistance, and economics. The time has come to capitalize on this exceptional energy technology, with the benefits of this development extending throughout the global energy economy in the 21st century.

#### Nuclear power is the most economic source of base-load power it’s key to solve GHG emissions by displacing pollutants.

Alexander DeVolpi, 2-28-2010, been active in nuclear-arms policy and treaty-verification technology studies for over 25 years, Argonne National Laboratory, Argonne, Illinois (and other national laboratories) involved nearly 40 years of lab, field, and analytical activities in instrumentation, nuclear physics, nuclear engineering, reactor safety, radioisotopes, experiments, verification technology, and arms control, the Defense Nuclear Agency, On-Site Inspection Agency, all the Department of Energy weapons labs, with the Departments of Defense and State, author or coauthor of several books, Ph.D. in physics (and MS in nuclear engineering physics) from Virginia Polytechnic Institute, certificate from the Argonne International Institute of Nuclear Science and Engineering, managing nuclear diagnostics for the Reactor Analysis and Safety Division at Argonne, and becoming technical manager of the arms-control and nonproliferation program, Who’s Who in Frontiers of Science and Technology, American Men and Women of Science, fellow of the American Physical Society, technical consultant in the Federation of American Scientists/Natural Resources Defense Council joint project, ScienceTechnologyHistory, “NUCLEAR EXPERTISE: The Amory Lovins Charade,” <http://sciencetechnologyhistory.wordpress.com/article/nuclear-expertise-the-amory-lovins-1gsyt5k142kc5-20/>

Nuclear power is not only commercially competitive, but extremely safe (no coal miners dying), no air pollution at all, no greenhouse gas emissions (such as carbon-dioxide). Nuclear-plant lifetime is being doubled from 30 to 60 years (which utilities, investors, and ratepayers appreciate). If Lovins had his way 30 years ago, considerably more particulates and gases would have been vented to the local and regional atmosphere from coal-fired plants (aside from the greenhouse gases emitted). Moreover, if Lovins had his way, we would not have conserved the electricity-equivalent in domestic coal, imported and domestic oil, and domestic and imported natural-gas resources and reserves that we have for 30 years. A typical nuclear power plant each year avoids consumption of 3.4 million short tons of coal, or 65.8 billion cubic feet of natural gas, or 14 billion barrels of oil. (The United States has ample uranium resources.) So Lovins was wrong in implying that nuclear had no overriding societal or environmental benefits. Incidentally, it’s no accident that Illinois has the highest concentration of nuclear-power plants in the United States: Argonne National Laboratory can be proud of its half-century nuclear stewardship. (California, by the way, generates more electricity from geothermal, solar, and wind energy sources combined than any other State.) Lovins displayed complex viewgraphs that, he purports, show that nuclear is the costliest of “low-or-non-nuclear resources.” Yet, in the last 30 years, nuclear has displaced half the fossil-fuel combustion in Illinois while still being competitive. Inasmuch as nuclear-power plants emit no byproduct carbon-dioxide to the atmosphere, surely his claim that it is the costliest of low-carbon-emission sources fails the smell test. Most of Lovins’ pricing and cost/benefit comparisons are based on “new delivered electricity” which frames the cost of U.S. domestic nuclear construction in the least favorable light. He declares nuclear power an economic failure. Can someone explain that to my bank account which has benefitted from compounding competitive electric power savings for the past 30 years? His rimy claim certainly fails the ripeness test. On the issue of electrical-grid reliability, Lovins asserts that there is no such thing as a “outage-free” source of electrical power. He must think that nuclear power runs by government fiat. Nuclear is a fixture on the grid because it is more economical to operate as base-load supply, while sources less reliable, intermittent, and more costly (such as wind, solar, and gas) provide supplementary power. During the past 30 years in Illinois, I don’t recall having the electricity supply and cost problems that California has had after it prohibited nuclear-power plants from being built within its borders. By the way, average U.S. nuclear capacity factor was about 92% in 2007. That’s excellent. Lovins pitiful effort to undermine the reliability of nuclear power egregiously fails the smell test.

#### Anthropogenic warming causes extinction – mitigating coal in the electric power industry is key to solve.

Mudathir F. Akorede et. al, June 2012, M.Eng degree at Bayero University Kano in Electrical Engineering, tutelage engineer in the Chad Basin Development Authority’s, lectureship appointment in the Department of Electrical Engineering, University of Ilorin, professional engineer with the Council for Regulation of Engineering in Nigeria (COREN), reviewer for a number of reputable international journals, Hashim Hizam, Department of Meterology and Atmospheric Sciences, faculty, University of Putra Malaysia, M.Sc in Electrical Engineering, Polytechnic University of Brooklyn, New York, M. Z. A. Ab Kadir and I. Aris, Department of Electrical and Electronics Engineering, Faculty of Engineering University Putra Malaysia, S.D. Buba professor of Climatology University of Putra Malaysia, Ph.D. paleoclimatology, University of Oxford, M.Eng at the University of Putra Malaysia, Renewable & Sustainable Energy Reviews, Vol. 16 Issue 5, “Mitigating the anthropogenic global warming in the electric power industry,” p. 1, Ebsco Host

One of the most current and widely discussed factors that could lead to the ultimate end of man’s existence and the world at large is global warming. Global warming, described as the greatest environmental challenge in the 21st century, is the increase in the average global air temperature near the surface of the Earth, caused by the gases that trap heat in the atmosphere called greenhouse gases (GHGs). These gases are emitted to the atmosphere mostly as a result of human activities, and can lead to global climate change. The economic losses arising from climate change presently valued at $125 billion annually, has been projected to increase to $600 billion per year by 2030, unless critical measures are taken to reduce the spate of GHG emissions. Globally, the power generation sector is responsible for the largest share of GHG emissions today. The reason for this is that most power plants worldwide still feed on fossil fuels, mostly coal and consequently produce the largest amount of CO2 emitted into the atmosphere. Mitigating CO2 emissions in the power industry therefore, would significantly contribute to the global efforts to control GHGs. This paper gives a brief overview of GHGs, discusses the factors that aid global warming, and examines the expected devastating effects of this fundamental global threat on the entire planet. The study further identifies the key areas to mitigate global warming with a particular focus on the electric power industry.

#### Climate change is real and anthropogenic – fundamental science, atmospheric patterns, greenhouse gas fingerprints, and newest measurements all confirm.

Karl Braganza, 6-14-2011, received his PhD from the School of Mathematics at Monash University, work has centered on understanding and attributing climate variability and change, using numerical modeling, instrumental observations and past climate evidence, currently the Head of Climate Monitoring at the Bureau of Meteorology's National Climate Center, The Conversation, "The Greenhouse Effect is Real: Here’s Why," <http://theconversation.edu.au/the-greenhouse-effect-is-real-heres-why-1515>

The greenhouse effect is fundamental science It would be easy to form the opinion that everything we know about climate change is based upon the observed rise in global temperatures and observed increase in carbon dioxide emissions since the industrial revolution. In other words, one could have the mistaken impression that the entirety of climate science is based upon a single correlation study. In reality, the correlation between global mean temperature and carbon dioxide over the 20th century forms an important, but very small part of the evidence for a human role in climate change. Our assessment of the future risk from the continued buildup of greenhouse gases in the atmosphere is even less informed by 20th century changes in global mean temperature. For example, our understanding of the greenhouse effect – the link between greenhouse gas concentrations and global surface air temperature – is based primarily on our fundamental understanding of mathematics, physics, astronomy and chemistry. Much of this science is textbook material that is at least a century old and does not rely on the recent climate record. For example, it is a scientific fact that Venus, the planet most similar to Earth in our solar system, experiences surface temperatures of nearly 500 degrees Celsius due to its atmosphere being heavily laden with greenhouse gases. Back on Earth, that fundamental understanding of the physics of radiation, combined with our understanding of climate change from the geological record, clearly demonstrates that increasing greenhouse gas concentrations will inevitably drive global warming. Dusting for climate fingerprints The observations we have taken since the start of 20th century have confirmed our fundamental understanding of the climate system. While the climate system is very complex, observations have shown that our formulation of the physics of the atmosphere and oceans is largely correct, and ever improving. Most importantly, the observations have confirmed that human activities, in particular a 40% increase in atmospheric carbon dioxide concentrations since the late 19th century, have had a discernible and significant impact on the climate system already. In the field known as detection and attribution of climate change, scientists use indicators known as fingerprints of climate change. These fingerprints show the entire climate system has changed in ways that are consistent with increasing greenhouse gases and an enhanced greenhouse effect. They also show that recent, long term changes are inconsistent with a range of natural causes. Is it getting hot in here? A warming world is obviously the most profound piece of evidence. Here in Australia, the decade ending in 2010 has easily been the warmest since record keeping began, and continues a trend of each decade being warmer than the previous, that extends back 70 years. Globally, significant warming and other changes have been observed across a range of different indicators and through a number of different recording instruments, and a consistent picture has now emerged. Scientists have observed increases in continental temperatures and increases in the temperature of the lower atmosphere. In the oceans, we have seen increases in sea-surface temperatures as well as increases in deep-ocean heat content. That increased heat has expanded the volume of the oceans and has been recorded as a rise in sea-level. Scientists have also observed decreases in sea-ice, a general retreat of glaciers and decreases in snow cover. Changes in atmospheric pressure and rainfall have also occurred in patterns that we would expect due to increased greenhouse gases. There is also emerging evidence that some, though not all, types of extreme weather have become more frequent around the planet. These changes are again consistent with our expectations for increasing atmospheric carbon dioxide. Patterns of temperature change that are uniquely associated with the enhanced greenhouse effect, and which have been observed in the real world include: greater warming in polar regions than tropical regions greater warming over the continents than the oceans greater warming of night time temperatures than daytime temperatures greater warming in winter compared with summer a pattern of cooling in the high atmosphere (stratosphere) with simultaneous warming in the lower atmosphere (troposphere).

#### Only the aff can pull us back from the edge – adequately brings down ppm amounts.

Steve Kirsch, 11-25-2009, M.S. Massachusetts Institute of Technology (MIT), writer for the Huffington Post, CEO Kirsch foundation on climate, founder/head of Center for Energy and Climate Change, National Award from the Caring Institute in Washington DC, written much about the Integral Fast Reactor, Fellow, with the Science Council for Global Initiatives (SCGI), Steve Kirsch’s blog, “Why We Should Build an Integral Fast Reactor Now,” <http://skirsch.wordpress.com/2009/11/25/ifr/>

\*\*\*cites Charles Till, former Associate Director, Argonne National Laboratory, The National Academy Studies, James Hansen, Director, NASA Goddard Institute for Space Studies, Ray Hunter, former Deputy Director of the Office of Nuclear Energy, Science and Technology in the U.S. Department of Energy (DOE), Leonard Koch, winner of the Global Energy International Prize, Barry Brook Sir Hubert Wilkins Chair of Climate Change\*\*\*

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.

#### Global warming risks collapse in biodiversity – scaling back emission solves.

Lee Hannah, 4-19-2012, is Senior Fellow in Climate Change Biology at Conservation International’s (CI) Center for Applied Biodiversity Science, tracking role of climate change in conservation planning and methods of corridor design, heads CI’s efforts to develop conservation responses to climate change, Yale Environment 360, “As Threats to Biodiversity Grow, Can We Save World’s Species?,” http://e360.yale.edu/feature/as\_threats\_to\_biodiversity\_grow\_can\_we\_save\_worlds\_species/2518/

Now, with 7 billion people on the planet — heading to 10 billion — and with greenhouse gas emissions threatening more rapid temperature rises than the warming that brought the last Ice Age to an end, the many millions of living things on Earth face an unprecedented squeeze. Is a wave of extinctions possible, and if so, what can we do about it? The late climate scientist and biologist Stephen Schneider once described this confluence of events — species struggling to adapt to rapid warming in a world heavily modified by human action — as a “no-brainer for an extinction spasm.” My colleagues Barry Brook and Anthony Barnosky recently put it this way, “We are witnessing a similar collision of human impacts and climatic changes that caused so many large animal extinctions toward the end of the Pleistocene. But today, given the greater magnitude of both climate change and other human pressures, the show promises to be a wide-screen technicolor version of the (by comparison) black-and-white letterbox drama that played out the first time around.” The magnitude of the threat was first quantified in a 2004 Nature study, “Extinction Risk from Climate Change.” This paper suggested that in six diverse regions, 15 to 37 percent of species could be at risk of extinction. If those six regions were typical of the global risk, the study’s authors later calculated, more than a million terrestrial and marine species could face extinction due to human encroachment and climate change — assuming conservatively that 10 million species exist in the world. Headlines around the world trumpeted the 1 million figure. Whether that scenario will unfold is unclear. But signs of what is to come are already all around us: nearly 100 amphibian species in South America vanishing in a disease outbreak linked to climate change, large areas of western North American facing massive die-offs of trees because of warming-driven beetle outbreaks, and increasing loss of coral reefs worldwide because of human activities and coral bleaching events driven by rising ocean temperatures. Most of the world’s biologically unique areas have already lost more than 70 percent of their high-quality habitat. The world community has the power to greatly reduce the prospect of an extinction spasm by lowering greenhouse gas emissions and launching large-scale conservation and forest preservation programs that both slow global warming and provide a sanctuary for countless species. But progress on these fronts is slow, and pressure on the world’s biodiversity remains relentless. An important part of the solution is preserving the ability of species to move across a changing landscape. Before humans, species responded to climate change by migrating, sometimes long distances, to track their preferred climatic conditions. Fully natural landscapes were conducive to these movements, with even slow-dispersing plants shifting the heart of their range on continental scales. The mechanisms of these changes are still being worked out, but we know they happened: Insects once found in Britain are now found only in the Himalayas, and centers of oak distribution have moved from the Mediterranean to Central Europe and from Georgia to Pennsylvania. Recent studies have shown that migration was an important method for species to cope with rapid climate change as far back as 55 million years ago, a period known as the Paleocene-Eocene Thermal Maximum, or PETM. Then, for reasons that are still not entirely clear, vast amounts of greenhouse gases were released into the atmosphere and oceans, leading to an increase in global temperatures of 4 to 9 degrees C (7 to 14 degrees F) in less than 10,000 years. Geological and fossil studies, using techniques such as stable isotope analysis, show major extinctions, the evolution of new animals and plants, and the migration of species on a large scale. Now, however, landscapes are crowded with human uses. Cities, urban sprawl, and agriculture take up huge areas. Freeways and roads create long linear obstructions to natural movement and present a patchwork of obstacles that are a severe challenge to species’ natural modes of shifting to track climate. To unravel these future responses requires understanding of past response, modeling of future response, and insights from changes already underway. To date, marine systems have experienced the most extensive impacts of climate change. From coral bleaching to melting sea ice, marine systems are changing on global and regional scales. Coral bleaching occurs when water temperatures exceed regional norms, causing corals to expel symbiotic micro-organisms from their tissues, ultimately leading to morbidity or death. Bleaching has exterminated some coral species from entire ocean basins. Global extinctions may follow as temperatures continue to rise. Corals face a second threat from acidification as CO2 builds up in the atmosphere and oceans, which prevents corals and many other marine organisms, including clams and oysters, from forming their calcium carbonate shells. Overall, the evidence suggests that the world’s roughly 5 million marine species face as severe threats from climate change as their terrestrial counterparts. On land, tropical biodiversity hotspots in places such as the Amazon and the rainforests of Indonesia and Malaysia are especially at risk. All global climate models now show significant future warming in the tropics, even if more muted than warming at high latitudes. Tropical animals, insects, and plants are tightly packed along climatic gradients from lowlands to mountaintops, and these organisms are sensitive to changes in temperature and rainfall. Already, scores of amphibians in South America have disappeared as a warmer, drier climate has led to outbreaks of disease such as the chytrid fungus. At the same time, large areas of tropical forest are being cleared for timber, ranching, and farming such crops as soybeans and oil palm.

#### Biodiversity loss causes extinction.

Ruth Young, 2-9-2010, Ph.D. in coastal marine ecology, “Biodiversity: what it is and why it’s important,” <http://www.talkingnature.com/2010/02/Biodiversity/Biodiversity-what-and-why/>

Different species within ecosystems fill particular roles, they all have a function, they all have a niche. They interact with each other and the physical environment to provide ecosystem services that are vital for our survival. For example plant species convert carbon dioxide (CO2) from the atmosphere and energy from the sun into useful things such as food, medicines and timber. A bee pollinating a flower (Image: ClearlyAmbiguous Flickr) Pollination carried out by insects such as bees enables the production of ⅓ of our food crops. Diverse mangrove and coral reef ecosystems provide a wide variety of habitats that are essential for many fishery species. To make it simpler for economists to comprehend the magnitude of services offered by Biodiversity, a team of researchers estimated their value – it amounted to $US33 trillion per year. “By protecting Biodiversity we maintain ecosystem services” Certain species play a “keystone” role in maintaining ecosystem services. Similar to the removal of a keystone from an arch, the removal of these species can result in the collapse of an ecosystem and the subsequent removal of ecosystem services. The most well known example of this occurred during the 19th century when sea otters were almost hunted to extinction by fur traders along the west coast of the USA. This led to a population explosion in the sea otters’ main source of prey, sea urchins. Because the urchins graze on kelp their booming population decimated the underwater kelp forests. This loss of habitat led to declines in local fish populations. Sea otters are a keystone species once hunted for their fur (Image: Mike Baird) Eventually a treaty protecting sea otters allowed the numbers of otters to increase which inturn controlled the urchin population, leading to the recovery of the kelp forests and fish stocks. In other cases, ecosystem services are maintained by entire functional groups, such as apex predators (See Jeremy Hance’s post at Mongabay). During the last 35 years, over fishing of large shark species along the US Atlantic coast has led to a population explosion of skates and rays. These skates and rays eat bay scallops and their out of control population has led to the closure of a century long scallop fishery. These are just two examples demonstrating how Biodiversity can maintain the services that ecosystems provide for us, such as fisheries. One could argue that to maintain ecosystem services we don’t need to protect Biodiversity but rather, we only need to protect the species and functional groups that fill the keystone roles. However, there are a couple of problems with this idea. First of all, for most ecosystems we don’t know which species are the keystones! Ecosystems are so complex that we are still discovering which species play vital roles in maintaining them. In some cases its groups of species not just one species that are vital for the ecosystem. Second, even if we did complete the enormous task of identifying and protecting all keystone species, what back-up plan would we have if an unforseen event (e.g. pollution or disease) led to the demise of these ‘keystone’ species? Would there be another species to save the day and take over this role? Classifying some species as ‘keystone’ implies that the others are not important. This may lead to the non-keystone species being considered ecologically worthless and subsequently over-exploited. Sometimes we may not even know which species are likely to fill the keystone roles. An example of this was discovered on Australia’s Great Barrier Reef. This research examined what would happen to a coral reef if it were over-fished. The “over-fishing” was simulated by fencing off coral bommies thereby excluding and removing fish from them for three years. By the end of the experiment, the reefs had changed from a coral to an algae dominated ecosystem – the coral became overgrown with algae. When the time came to remove the fences the researchers expected herbivorous species of fish like the parrot fish (Scarus spp.) to eat the algae and enable the reef to switch back to a coral dominated ecosystem. But, surprisingly, the shift back to coral was driven by a supposed ‘unimportant’ species – the bat fish (Platax pinnatus). The bat fish was previously thought to feed on invertebrates – small crabs and shrimp, but when offered a big patch of algae it turned into a hungry herbivore – a cow of the sea – grazing the algae in no time. So a fish previously thought to be ‘unimportant’ is actually a keystone species in the recovery of coral reefs overgrown by algae! Who knows how many other species are out there with unknown ecosystem roles! In some cases it’s easy to see who the keystone species are but in many ecosystems seemingly unimportant or redundant species are also capable of changing niches and maintaining ecosystems. The more Biodiversityiverse an ecosystem is, the more likely these species will be present and the more resilient an ecosystem is to future impacts. Presently we’re only scratching the surface of understanding the full importance of Biodiversity and how it helps maintain ecosystem function. The scope of this task is immense. In the meantime, a wise insurance policy for maintaining ecosystem services would be to conserve Biodiversity. In doing so, we increase the chance of maintaining our ecosystem services in the event of future impacts such as disease, invasive species and of course, climate change. This is the international year of Biodiversity – a time to recognize that Biodiversity makes our survival on this planet possible and that our protection of Biodiversity maintains this service.

#### Won’t adapt – environmental stressors.

Ilya M. D. Maclean & Robert J. Wilson, 7-26-2011, Postdoctoral researcher at the University of Exeter, Geography College of Life and Environmental Sciences, Ph.D. University of Exeter, and Robert J. Wilson is a Senior Lecturer in Conservation Biology, University of Exeter, member of the Behavior, Ecology and Conservation research group, Ph.D. University of Leeds, Ramon y Cajal Research Fellow, Proceedings of the National Academy of Sciences of the United States of America, Vol. 108 Issue 30, “Recent ecological responses to climate change support predictions of high extinction risk,” p. 12,340-1, Ebsco Host

Our results lend support to the contention, based on entirely different data and methods (1), that anthropogenic climate Fig. 3. Frequency distribution of extinction risk by 2100 in (Left) observed and (Right) predicted studies of ecoregions: (row 1) polar and boreal, (row 2) temperate, (row 3) tropical and subtropical, and (row 4) marine. Actual proportion derived from studies (histogram bars) together with afittedβ-probability function (black curve). The dark bars (actual) andhorizontal black lines (modeled) represent the frequency of studies with an extinction risk of zero or one. Data are scaled such that the total area of histogram bars and under the modeled extinction risk line is equal to one. Nis the number of samples in each category. Warming at least ranks alongside other recognized threats to global biodiversity. Based on published results, we endeavor to distinguish between responses to climate and other drivers of change, although in many cases, the mechanisms behind species responses to climate change are not known. Several studies suggest that changes to biotic interactions have led to increased extinction risk for at least one interacting species (10, 23). Habitat degradation (24), invasive species (25), and over-exploitation (26) play additional roles, and interactions among these threats and climate change will increasingly threaten populations of species. In addition, rapid climate change has the potential to overwhelm the capacity for adaptation in many populations, reducing the ability to resist and recover from other environmental stressors (27). Our metaanalysis showing high predicted levels of extinction, backed up by consistent data for changes that have already occurred, shows the need to give cli-mate change high priority in conservation planning and to communicate its potentially wide-ranging consequences to policy makers and the wider public.

#### Causes rampant disease spread.

Kirsten Adair, 4-22-2012, Yale Law, Yale Daily News, “Global warming may intensify disease,” <http://www.yaledailynews.com/news/2012/apr/11/global-warming-may-intensify-disease/>

\*\*\*cites Gerald Friedland, professor of medicine and epidemiology and public health at the Yale School of Medicine\*\*\*

According to several leading climate scientists and public health researchers, global warming will lead to higher incidence and more intense versions of disease. The direct or indirect effects of global warming might intensify the prevalence of tuberculosis, HIV/AIDS, dengue and Lyme disease, they said, but the threat of increased health risks is likely to futher motivate the public to combat global warming. “The environmental changes wrought by global warming will undoubtedly result in major ecologic changes that will alter patterns and intensity of some infectious diseases,” said Gerald Friedland, professor of medicine and epidemiology and public health at the Yale School of Medicine. Global warming will likely cause major population upheavals, creating crowded slums of refugees, Friedland said. Not only do areas of high population density facilitate disease transmission, but their residents are more likely to be vulnerable to disease because of malnutrition and poverty, he said. This pattern of vulnerability holds for both tuberculosis and HIV/AIDS, increasing the incidence of both the acquisition and spread of the diseases, he explained. He said these potential effects are not surprising, since tuberculosis epidemics historically have followed major population and environmental upheavals. By contrast, global warming may increase the infection rates of mosquito-borne diseases by creating a more mosquito-friendly habitat. Warming, and the floods associated with it, are like to increase rates of both malaria and dengue, a debilitating viral disease found in tropical areas and transmitted by mosquito bites, said Maria Diuk-Wasser, assistant professor of epidemiology at the Yale School of Public Health. “The direct effects of temperature increase are an increase in immature mosquito development, virus development and mosquito biting rates, which increase contact rates (biting) with humans. Indirect effects are linked to how humans manage water given increased uncertainty in the water supply caused by climate change,” Diuk-Wasser said.

#### New-type infectious disease spread causes extinction.

Victoria Yu, 5-22-2009, Dartmouth Journal of Science, “Human Extinction: The Uncertainty of Our Fate,” http://dujs.dartmouth.edu/spring-2009/human-extinction-the-uncertainty-of-our-fate

A pandemic will kill off all humans. In the past, humans have indeed fallen victim to viruses. Perhaps the best-known case was the bubonic plague that killed up to one third of the European population in the mid-14th century (7). While vaccines have been developed for the plague and some other infectious diseases, new viral strains are constantly emerging — a process that maintains the possibility of a pandemic-facilitated human extinction. Some surveyed students mentioned AIDS as a potential pandemic-causing virus. It is true that scientists have been unable thus far to find a sustainable cure for AIDS, mainly due to HIV’s rapid and constant evolution. Specifically, two factors account for the virus’s abnormally high mutation rate: 1. HIV’s use of reverse transcriptase, which does not have a proof-reading mechanism, and 2. the lack of an error-correction mechanism in HIV DNA polymerase (8). Luckily, though, there are certain characteristics of HIV that make it a poor candidate for a large-scale global infection: HIV can lie dormant in the human body for years without manifesting itself, and AIDS itself does not kill directly, but rather through the weakening of the immune system. However, for more easily transmitted viruses such as influenza, the evolution of new strains could prove far more consequential. The simultaneous occurrence of antigenic drift (point mutations that lead to new strains) and antigenic shift (the inter-species transfer of disease) in the influenza virus could produce a new version of influenza for which scientists may not immediately find a cure. Since influenza can spread quickly, this lag time could potentially lead to a “global influenza pandemic,” according to the Centers for Disease Control and Prevention (9). The most recent scare of this variety came in 1918 when bird flu managed to kill over 50 million people around the world in what is sometimes referred to as the Spanish flu pandemic. Perhaps even more frightening is the fact that only 25 mutations were required to convert the original viral strain — which could only infect birds — into a human-viable strain (10).

### 1AC spent fuel advantage

#### ADVANTAGE:\_\_ spent fuel

#### Utilities currently store waste in interim storage on site – no reprocessing forces this option.

Robert Alvarez, May 2011, is a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, former secretary in the DOE, “Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage”, Institute for Policy Studies, <http://www.scribd.com/doc/95322584/Spent-Nuclear-FuelPools-in-the-U-S-Reducing-the-Deadly-Risks-of-Storage>

This tragic event is casting a spotlight on the spent fuel pools at U.S. nuclear reactors, which store some of the largest concentrations of radioactivity on the planet. For nearly 30 years, Nuclear Regula-tory Commission waste-storage requirements have been contingent on the timely opening of a permanent waste repository. This has allowed plant operators to legally store spent fuel in onsite cooling pools much longer, and at higher densities (on average four times higher), than was originally intended. Spent fuel pools were designed to be temporary and to store only a small fraction of what they currently hold. “Neither the AEC [Atomic Energy Com-mission, now the Energy Department] nor utilities anticipated the need to store large amounts of spent fuel at operating sites,” said a report by Dominion Power, the owner of the Millstone nuclear reactor in Waterford, Connecticut in October 2001. “Large-scale commercial reprocessing never materialized in the United States. As a result, operating nuclear sites were required to cope with ever-increasing amounts of irradiated fuel... This has become a fact of life for nuclear power stations.

#### U.S. spent fuel pools are a unique risk for mass radiation leaks due to poor protection.

Robert Alvarez, May 2011, is a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, former secretary in the DOE, “Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage”, Institute for Policy Studies, <http://www.scribd.com/doc/95322584/Spent-Nuclear-FuelPools-in-the-U-S-Reducing-the-Deadly-Risks-of-Storage>

Nearly 40 percent of the radioactivity in U.S. spent fuel is cesium-137 (4.5 billion curies) — roughly 20 times more than released from all atmospheric nuclear weapons tests. U.S. spent pools hold about15-30 times more cesium-137 than the Chernobyl ac-cident released. For instance, the pool at the Vermont Yankee reactor, a BWR Mark I, currently holds nearly three times the amount of spent fuel stored at Dai-Ichi's crippled Unit 4 reactor. The Vermont Yankee reactor also holds about seven percent more radioactivity than the combined total in the pools at the four troubled reactors at the Fukushima site. Even though they contain some of the larg-est concentrations of radioactivity on the planet, U.S. spent nuclear fuel pools are mostly contained in ordi-nary industrial structures designed to merely protect them against the elements. Some are made from ma-terials commonly used to house big-box stores and car dealerships. The United States has 31 boiling water reactors (BWR) with pools elevated several stories above ground, similar to those at the Fukushima Dai-Ichi station. Asin Japan, all spent fuel pools at nuclear power plants do not have steel-lined, concrete barriers that cover reactor vessels to prevent the escape of radioactivity. They are not required to have back-up generators to keep used fuel rods cool, if off site power is lost. The 69 Pressurized Water (PWR) reactors operating in the U.S. do not have elevated pools, and also lack proper containment and several have large cavities beneath them which could exacerbate leakage.

#### Accident is likely now - the majority of U.S. spent fuel pools are in earthquake zones.

Robert Alvarez, May 2011, is a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, former secretary in the DOE, “Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage”, Institute for Policy Studies, <http://www.scribd.com/doc/95322584/Spent-Nuclear-FuelPools-in-the-U-S-Reducing-the-Deadly-Risks-of-Storage>

There are 104 U.S. commercial nuclear reactors operating at 64 sites in 31 states that are holding some of the largest concentrations of radioactivity on the planet in onsite spent fuel pools. The pools, typically rectangular or L-shaped basins about 40to 50 feet deep, are made of reinforced concrete walls four to five feet thick and stainless steel liners. Basins without steel liners are more susceptible to cracks and corrosion. Most of the spent fuel ponds at boiling water reactors are housed in reactor buildings several stories above ground. Pools at pressurized water reactors are partially or fully embedded in the ground, sometimes above tunnels or underground rooms. According to estimates provided by the Department of Energy, as of this year this spent fuel contains a total of approximately 12 billion curies of long-lived radioactivity (Table 1).6 Of the 65,000 metric tons estimated by the Nuclear Energy Institute to be generated by the end of 2010, 75 percent is in pools, while the remainder is in dry storage casks. Several of these reactors are located in earthquake zones (Figure 5).

#### No time to contain a U.S. waste spill due to an earthquake.

Tony Dutzik, 3-17-2011, is senior policy analyst, “What Are the Risks Posed by Spent Fuel Pools in the United States?,” Frontier Group, http://www.frontiergroup.org/blogs/blog/fg/what-are-risks-posed-spent-fuel-pools-united-states

The risks of radiation releases from the loss of coolant from spent fuel pools are quite real. Indeed, the occurrence of an earthquake that exceeds the design basis of the nuclear plant has been identified as one of the most probable causes of a loss-of-coolant accident involving spent fuel. In 2006, the U.S. National Research Council issued a detailed report on the risk posed by a terrorist attack on spent fuel pools at nuclear reactors. Among the authors’ conclusions were that “under some conditions, a terrorist attack that partially or completely drained a spent fuel pool could lead to a propagating zirconium cladding fire and the release of large quantities of radioactive materials to the environment.” The report also cited a 2001 Nuclear Regulatory Commission study, summarizing it as follows: “The analysis suggested that large earthquakes and drops of fuel casks from an overhead crane during transfer operations were the two event initiators that could lead to a loss-of-pool-coolant accident. For cases where active cooling (but not the coolant) has been lost, the thermal-hydraulic analyses suggested that operators would have about 100 hours (more than four days) to act before the fuel was uncovered sufficiently through boiling of cooling water in the pool to allow the fuel rods to ignite. This time was characterized as an 'underestimate' given the simplifications assumed for the loss-of-pool-coolant scenario.”

#### PRISMs utilize spent fuel pools as catalysts for energy - eliminates waste.

W.H. Hannum et. al, 2010, has been a senior official with the Department of Energy, H.F. McFarlane earned his Ph.D. in engineering science at California Institute of Technology, is currently associate director of the Technology Development Division at Argonne National Laboratory, D.C. Wade is a Senior Technical Advisor, Distinguished Fellow Engineer Nuclear Engineering Division Argonne National Laboratory, R.N. Hill is the Technical Director at Argonne National Laboratory, Nuclear Energy R&D Nuclear Engineering Division, “The Benefits of an Advanced Fast Reactor Fuel Cycle for Plutonium Management,” p. 18, <http://www.osti.gov/bridge/servlets/purl/459313-d9NYz8/webviewable/>

Plutonium is a fact. World inventories currently exceed 1000 tonnes, and are increasing at 60 to 80 tonnes per year. This can be considered a valuable energy resource or a political and environmental burden, The best approach is that which will maximize the benefits and minimize the burden. A closed fast reactor he1 cycle using an advanced recycle technology provides such an option by using plutonium as a catalyst to extract the full energy content from the world’s uranium reserves, while eliminating excess inventories of plutonium and of other long lived transuranic byproducts. Such a system is fully compatible with rigorous safeguards, and in fact presents few safeguard challenges beyond those which are associated with the once-thorough fuel cycle. The most important long-term contribution of the fast reactor approach to safeguards and prevention of proliferation is that it provides a positive means of managing the overall size of the world’s plutonium and transuranic inventory (Ref. 30). With a kel cycle management strategy driven by economics, the fast reactor can readily absorb excess plutonium stocks, leaving the world inventory sequestered in plants producing useful energy.

#### Existing reprocessing tech is not safe – sheer volume of solutes guarantees critical mass accidents resulting in deadly fallout worsening waste.

Stephen Berry & George S. Tolley, 11-29-2010, James Franck Distinguished Service Professor Emeritus at the University of Chicago, Fellow, American Academy of Arts and Sciences, foreign Member, Royal Danish Academy of Sciences, member and Home Secretary, National Academy of Sciences, J. Heyrovsky Honorary Medal for Merit in the Chemical Sciences, Academy of Sciences of the Czech Republic, Alexander von Humboldt-Stiftung Senior Scientist Award, Phi Beta Kappa National Lecturer, George S. Tolley is a professor emeritus in Economics at the University of Chicago, fellow, American Association for the Advancement of Science, honorary editor, Resource and Energy Economics, honorary Ph.D., North Carolina State University, “Nuclear Fuel Reprocessing Future Prospects and Viability,” p. 6, <http://humanities.uchicago.edu/orgs/institute/bigproblems/Team7-1210.pdf>

Although PUREX is a well-documented and widely used process today, it is far from perfect. Ideally, reprocessing should aim to reduce the radioactivity of waste. While PUREX accomplishes this in some regard, due to the sheer volume of solutes used the result is a much larger quantity of less radioactive waste. Another important concern is that with any buildup of uranium or plutonium there is a possibility of critical mass being attained. Although a chain reaction resulting from such a small amount of lowly enriched material would not be devastating, it could result in direct exposure of workers to high energy gamma and neutron radiation, minor concern for fallout of material into the environment, and decommissioning of the plant. The most recent example of such an accident was in 1999 at the Tokaimura reprocessing plant in Japan. The U-235 criticality achieved was a result of improperly trained workers circumventing standard mixing protocol to expedite the process. Two of the three workers responsible died from receiving a full body radiation dose ~10000 mSv (millisievert). Other workers in the plant as well as people in the surrounding area received radiation doses as well, but none of these exceeded ~50 mSv the average lethal dose being 8000 mSv.5 One could argue that such an accident would never occur if the facility was operated according to standard regulations, but the ability to ensure such fastidious observation of the rules in all workers is debatable.

#### Massive ionizing radiation release makes extinction inevitable.

Rosalie Bertell, 2000, American physician and epidemiologist and winner of several awards, including the Hans-Adalbert-Schweigart-Medal (1983), Right Livelihood Award (1986) World Federalist Peace Award, Ontario Premier's Council on Health, Health Innovator Award, the United Nations Environment Programme Global 500 award, and the Sean MacBride International Peace Prize, “Part One: The Problem: Nuclear Radiation and its Biological Effects,” No Immediate Danger, Prognosis for a Radioactive Earth, The Book Publishing Company, <http://www.ratical.org/radiation/NRBE/NRBE9.html>

In 1964 Hermann Müller published a paper, `Radiation and Heredity', spelling out clearly the implications of his research for genetic effects (damage to offspring) of ionizing radiation on the human species. [17] The paper, though accepted in medical/biological circles, appears not to have affected policy makers in the political or military circles who normally undertake their own critiques of published research. Müller predicted the gradual reduction of the survival ability of the human species as several generations were damaged through exposure to ionizing radiation. This problem of genetic damage continues to be mentioned in official radiation-health documents under the heading `mild mutations'[18] but these mutations are not `counted' as health effects when standards are set or predictions of health effects of exposure to radiation are made. There is a difficulty in distinguishing mutations caused artificially by radiation from nuclear activities from those which occur naturally from earth or cosmic radiation. A mild mutation may express itself in humans as an allergy, asthma, juvenile diabetes, hypertension, arthritis, high blood cholesterol level, slight muscular or bone defects, or other genetic `mistakes'. These defects in genetic make-up leave the individual slightly less able to cope with ordinary stresses and hazards in the environment. Increasing the number of such genetic `mistakes' in a family line, each passed on to the next generation, while at the same time increasing the stresses and hazards in the environment, leads to termination of the family line through eventual infertility and/or death prior to reproductive age. On a large scale, such a process leads to selective genocide of families or species suicide.

#### Environmental impact of a nuclear war.

Leah Ayala, Winter 2003, “Nuclear Power Companies the Department of Energy: A Legal Remedy Magnifying Nuclear Ends,” Nevada Law Journal, Lexis Nexis

A very small amount of nuclear waste can be disastrous. If an amount of plutonium about the same size as a beach ball was properly dispersed, it could cause lung cancer in everyone on earth. R. Routley & V. Routley, Nuclear Energy and Obligations to the Future, 21 INQUIRY 133, 136 (1978). See generally Robin Dusek, Lost in Space?: The Legal Feasibility of Nuclear Waste Disposal in Outer Space, 22 WM. & MARY ENVTL. L. & POL'Y REV. 181 (1997). Some estimate that a large release of nuclear waste from Yucca Mountain, which has a capacity to hold 77,000 metric tons of waste, would exceed the environmental impact of a nuclear war. This is a huge amount of waste compared to the "few dozen pounds" of waste released in the Chernobyl explosion that is estimated will result in between 17,000 to 475,000 human deaths from cancer. Broad, supra note 132. Each of the spent fuel assemblies that will be stored in the repository contains a similar amount of radioactivity as ten Hiroshima bombs. Lazarus, supra note 1 (citing Klaus Schumann, a Green Party activist and member of the San Luis Obispo County Nuclear Waste Management Committee).

#### The fallout would spread well beyond the U.S.

Science Daily, 5-22-2012, “Severe Nuclear Reactor Accidents Likely Every 10 to 20 Years, European Study Suggests,” <http://www.sciencedaily.com/releases/2012/05/120522134942.htm>

Subsequently, the researchers determined the geographic distribution of radioactive gases and particles around a possible accident site using a computer model that describes Earth's atmosphere. The model calculates meteorological conditions and flows, and also accounts for chemical reactions in the atmosphere. The model can compute the global distribution of trace gases, for example, and can also simulate the spreading of radioactive gases and particles. To approximate the radioactive contamination, the researchers calculated how the particles of radioactive caesium-137 (137Cs) disperse in the atmosphere, where they deposit on Earth's surface and in what quantities. The 137Cs isotope is a product of the nuclear fission of uranium. It has a half-life of 30 years and was one of the key elements in the radioactive contamination following the disasters of Chernobyl and Fukushima.The computer simulations revealed that, on average, only eight percent of the 137Cs particles are expected to deposit within an area of 50 kilometres around the nuclear accident site. Around 50 percent of the particles would be deposited outside a radius of 1,000 kilometres, and around 25 percent would spread even further than 2,000 kilometres. These results underscore that reactor accidents are likely to cause radioactive contamination well beyond national borders.

#### U.S. nuclear spent fuel storage is worse than Japan - has four times the quantity of spent fuel.

Edward Klump & Mike Lee, 3-19-2011, “Atomic Fuel Stored at U.S. Plants Poses Risks Similar to Japan Facilities,” Bloomberg, http://www.bloomberg.com/news/2011-03-19/atomic-fuel-stored-at-u-s-plants-poses-risks-similar-to-japan-facilities.html

U.S. nuclear power plants that store thousands of metric tons of spent atomic fuel pose risks of a crisis like the one unfolding in Japan, where crews are battling to prevent a meltdown of stored fuel, nuclear safety experts said. U.S. nuclear plants had an estimated 63,000 metric tons (138.9 million pounds) of spent fuel stored on site as of January 2010, according to a report from the U.S. Nuclear Regulatory Commission. About 2,000 metric tons a year is expected to be added to that total, the NRC said. The fuel, which contains uranium and radioactive byproducts, is taken from reactors and stored at least five years in water-filled cooling pools, then sometimes sealed in steel-and-concrete casks for longer-term storage. Without cooling, the spent fuel would overheat and release harmful radiation. “In the U.S., we are worse off, said David Lochbaum, a nuclear engineer for the Union of Concerned Scientists who is a former safety instructor for the NRC. ‘‘Our spent-fuel pools are more full than in Japan.’’ Storing radioactive waste has been a key sticking point in the expansion of nuclear power in the U.S. as landowners and environmental groups oppose plans for fuel dumps. A storage site at Yucca Mountain in Nevada was canceled by the Obama administration in 2009 after 20 years of planning and a cost of $9 billion.

### 1AC solvency

#### Loan guarantees are key to establishing PRISM reactors.

Stephen Berry & George S. Tolley, 11-29-2010, James Franck Distinguished Service Professor Emeritus at the University of Chicago, Fellow, American Academy of Arts and Sciences, foreign Member, Royal Danish Academy of Sciences, member and Home Secretary, National Academy of Sciences, J. Heyrovsky Honorary Medal for Merit in the Chemical Sciences, Academy of Sciences of the Czech Republic, Alexander von Humboldt-Stiftung Senior Scientist Award, Phi Beta Kappa National Lecturer, George S. Tolley is a professor emeritus in Economics at the University of Chicago, fellow, American Association for the Advancement of Science, honorary editor, Resource and Energy Economics, honorary Ph.D., North Carolina State University, “Nuclear Fuel Reprocessing Future Prospects and Viability,” p. 38, <http://humanities.uchicago.edu/orgs/institute/bigproblems/Team7-1210.pdf>

The construction of an aqueous solvent extraction plant would be out of date, especially when the more promising option of pyroprocessing is on the horizon. In comparison, to current available methods, pyroprocessing produces virtually no waste, can be done on-site, and offers the option of fabricating proliferation resistant fuel from plutonium as well as uranium. The second question in regard to domestic reprocessing is, “how much direct involvement should the government have in the reprocessing business?” Government involvement could be justified on the grounds of the externalities present in nuclear waste disposal. This could take on a variety of forms - government research efforts, subsidizing reprocessing (or offering tax credits and loan guarantees), or even operating a reprocessing center on its own. Through its actions, the government will be able to influence the development and growth of the nuclear reprocessing industry in the United States. These efforts in support of pyroprocessing and other advanced fuel cycle technologies represent a small portion of the Department of Energy budget - only $142,652,000 out of a total of $33,856,453,000 in discretionary funding in FY 2009, or less than half of one percent98. Furthermore, private companies do not have sufficient independent incentives to reduce the long-term health and environmental consequences of nuclear waste disposal. While it is beyond the scope of this paper to present a formal costbenefit analysis of R&D efforts, given the minimal costs and the large potential benefits, the chances of success do not need to be very high to justify continued government expenditures in this area.

#### PRISM’s are at low cost and have expedited construction because of a pre-licensed design – solves emission problems.

Magdi Ragheb, 3-9-2012, Ph.D., Nuclear Engineering/Computer Sciences, Univ. of Wisconsin, Associate Professor, Interdisciplinary Research Center, National Center for Supercomputing Applications (NCSA), Univ. of Illinois at Urbana-Champaign, Fusion Research Program, Univ. of Wisconsin, Department of Nuclear Engineering, Brookhaven National Laboratory, “RESTARTING THE STALLED USA NUCLEAR RENAISSANCE,” <https://netfiles.uiuc.edu/mragheb/www/NPRE%20402%20ME%20405%20Nuclear%20Power%20Engineering/Restarting%20the%20USA%20Stalled%20Nuclear%20Renaissance.pdf>

GE Hitachi Nuclear Energy, GEH next evolution of the Na cooled reactor technology is the Power Reactor Innovative Small Modular, PRISM reactor concept. The use of Na as a coolant allows for a fast neutrons spectrum in the core allowing breeding; hence a long time between refuellings. In addition, the hard neutron spectrum fissions the transuranic elements produced in the U-Pu fuel cycle, converting them into shorter lived fission products. This produces useful energy as well as reduces the volume and complexity of the U-Pu cycle waste disposal problem. The concept can also be used for consuming the transuranics in used nuclear fuel from water cooled reactors. Sodium-cooled reactors enjoy a safety aspect of operating at low pressure compared with light water cooled reactors. The PRISM reactor employs passive safety design features. Its simple design, allows factory fabrication with modular construction and ultimately lower costs. Passive core cooling is used enhancing the reactor’s safety. The residual or decay heat is passively released to the atmosphere with the elimination of active safety systems. Electromagnetic pumps without moving parts are used, eliminating valves and motors used in other nuclear island designs. The standardized modular design allows for an expedited construction schedule due to pre-licensed design, and factory fabrication. PRISM has a reference construction schedule of 36 months. A single PRISM power block generating 622 MWe the same amount of electricity generated in the USA through conventional sources would reduce greenhouse gas emissions by an amount equivalent to taking 700,000 cars off the road while at the same time offering the possibility of acting as an actinides burner consuming LWRs used nuclear fuel.

#### No risk of accidents – chemical benefits and engineering experience.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

One of the issues most often mentioned when discussing sodium-cooled fast reactors—by far the type with the most reactor-years of experience worldwide—is the chemical reactivity of sodium, which burns upon contact with air (though with a very cool flame) and reacts quite dramatically upon contact with water. Yet sodium has several compelling advantages in fast-reactor operation: superior heat-exchange properties, virtually no corrosive effect on reactor components even after decades of operation, short half-life of sodium isotopes that form in the reactor vessel, etc. (see previous section). Some advocates of other systems characterize sodium’s volatility as a deal-breaker. But the intermediate loop that transfers heat from the reactor vessel to the steam generator contains only non-radioactive sodium, with the steam generator isolated in a separate structure, assuring that in the highly unlikely event of a sodium-water reaction there will be no danger to the primary system and no chance of radioactive material being involved. This design means that the unfairly characterized sodium problem is nothing more than an engineering design issue, involving a common element that has been used in industrial processes for well over a century. With over 300 reactor-years of experience with sodium-cooled fast reactors around the world, not a single instance of sodium-water interaction resulting in radioactive release has been recorded [15].

# Northwestern round 1

## 2AC

### 2AC topicality – ‘For’

#### We meet - loan guarantees are financial incentives for energy.

Kernaghan Webb, 1993, lecturer in the Faculty of Law at the University of Ottawa, “Thumbs, Fingers, and Pushing on String: Legal Accountability in the Use of Federal Financial Incentives,” Lexis Nexis

In this paper, "financial incentives" are taken to mean disbursements 18 of public funds or contingent commitments to individuals and organizations, intended to encourage, support or induce certain behaviors in accordance with express public policy objectives. They take the form of grants, contributions, repayable contributions, loans, loan guarantees and insurance, subsidies, procurement contracts and tax expenditures.19 Needless to say, the ability of government to achieve desired behavior may vary with the type of incentive in use: up-front disbursements of funds (such as with contributions and procurement contracts) may put government in a better position to dictate the terms upon which assistance is provided than contingent disbursements such as loan guarantees and insurance. In some cases, the incentive aspects of the funding come from the conditions attached to use of the monies.20 In others, the mere existence of a program providing financial assistance for a particular activity (eg. low interest loans for a nuclear power plant, or a pulp mill) may be taken as government approval of that activity, and in that sense, an incentive to encourage that type of activity has been created.21 Given the wide variety of incentive types, it will not be possible in a paper of this length to provide anything more than a cursory discussion of some of the main incentives used.22

#### C/I - Financial incentives include loan guarantees - distinguished from rules, regulations and policies.

DSIRE (Database of State Incentives for Renewables & Efficiency), 2012, Database of State Incentives for Renewables & Efficiency, Glossary, “Financial Incentives,” http://www.dsireusa.org/glossary/

DSIRE organizes incentives and policies that promote renewable energy and energy efficiency into two general categories -- (1) Financial Incentives and (2) Rules, Regulations & Policies -- and roughly 30 specific types of incentives and policies. This glossary provides a description of each specific incentive and policy type. FINANCIAL INCENTIVES (click to expand section) Corporate Tax Incentives Corporate tax incentives include tax credits, deductions and exemptions. These incentives are available in some states to corporations that purchase and install eligible renewable energy or energy efficiency equipment, or to construct green buildings. In a few cases, the incentive is based on the amount of energy produced by an eligible facility. Some states allow the tax credit only if a corporation has invested a minimum amount in an eligible project. Typically, there is a maximum limit on the dollar amount of the credit or deduction. In recent years, the federal government has offered corporate tax incentives for renewables and energy efficiency. (Note that corporate tax incentives designed to support manufacturing and the development of renewable energy systems or equipment, or energy efficiency equipment, are categorized as “Industry Recruitment/Support” in DSIRE.)Grant Programs States offer a variety of grant programs to encourage the use and development of renewables and energy efficiency. Most programs offer support for a broad range of technologies, while a few programs focus on promoting a single technology, such as photovoltaic (PV) systems. Grants are available primarily to the commercial, industrial, utility, education and/or government sectors. Most grant programs are designed to pay down the cost of eligible systems or equipment. Others focus on research and development, or support project commercialization. In recent years, the federal government has offered grants for renewables and energy efficiency projects for end-users. Grants are usually competitive. Green Building Incentives Green buildings are designed and constructed using practices and materials that minimize the impacts of the building on the environment and human health. Many cities and counties offer financial incentives to promote green building. The most common form of incentive is a reduction or waiver of a building permit fee. The U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) is a popular point-based certification program for green buildings. The LEED system awards points for site selection and development; material, energy and water efficiency; indoor air quality; innovation; and the application of renewable technologies. (Note that this category includes green building incentives that do not fall under other DSIRE incentive categories, such as tax incentives and grant programs.)Industry Recruitment/Support To promote economic development and the creation of jobs, some states offer financial incentives to recruit or cultivate the manufacturing and development of renewable energy systems and equipment. These incentives commonly take the form of tax credits, tax exemptions and grants. In some cases, the amount of the incentive depends on the quantity of eligible equipment that a company manufactures. Most of these incentives apply to several renewable energy technologies, but a few states target specific technologies, such as wind or solar. These incentives are usually designed as temporary measures to support industries in their early years. They commonly include a sunset provision to encourage the industries to become self-sufficient. Loan Programs Loan programs provide financing for the purchase of renewable energy or energy efficiency systems or equipment. Low-interest or zero-interest loans for energy efficiency projects are a common demand-side management (DSM) practice for electric utilities. State governments also offer low-interest loans for a broad range of renewable energy and energy efficiency measures. These programs are commonly available to the residential, commercial, industrial, transportation, public and/or non-profit sectors. Loan rates and terms vary by program; in some cases, they are determined on an individual project basis. Loan terms are generally 10 years or less. In recent years, the federal government has offered loans and/or loan guarantees for renewables and energy efficiency projects. PACE Financing Property-Assessed Clean Energy (PACE) financing effectively allows property owners to borrow money to pay for renewable energy and/or energy-efficiency improvements. The amount borrowed is typically repaid over a period of years via a special assessment on the owner's property. In general, local governments (such as cities and counties) that choose to offer PACE financing must be authorized to do so by state law. Performance-Based Incentives Performance-based incentives (PBIs), also known as production incentives, provide cash payments based on the number of kilowatt-hours (kWh) or BTUs generated by a renewable energy system. A "feed-in tariff" is an example of a PBI.

#### C/I - Used in the topic, ‘for’ is a prepositional verb meaning to wish something to be obtained.

Merriam Webster’s, 2012, <http://dictionary.reference.com/browse/for>

For; prepositional verb - used to express a wish, as of something to be experienced or obtained.

### solvency

#### PRISM’s are at low cost and have expedited construction because of a pre-licensed design – solves emission problems.

Magdi Ragheb, 3-9-2012, Ph.D., Nuclear Engineering/Computer Sciences, Univ. of Wisconsin, Associate Professor, Interdisciplinary Research Center, National Center for Supercomputing Applications (NCSA), Univ. of Illinois at Urbana-Champaign, Fusion Research Program, Univ. of Wisconsin, Department of Nuclear Engineering, Brookhaven National Laboratory, “RESTARTING THE STALLED USA NUCLEAR RENAISSANCE,” <https://netfiles.uiuc.edu/mragheb/www/NPRE%20402%20ME%20405%20Nuclear%20Power%20Engineering/Restarting%20the%20USA%20Stalled%20Nuclear%20Renaissance.pdf>

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#### PRISM could be developed in five years – other reprocessing alternatives create worse waste problems.

Fred Pearce, 8-8-2012, is a freelance author and journalist based in the UK, he serves as environmental consultant for New Scientist magazine and is the author of numerous books, including When The Rivers Run Dry and With Speed and Violence, in previous articles for Yale Environment 360, environment 360, Breakthrough Institute, “Nuclear Fast Reactor: The Saviour of Nuclear Power?,” <http://oilprice.com/Alternative-Energy/Nuclear-Power/Nuclear-Fast-Reactor-The-Saviour-of-Nuclear-Power.html>Apart from a fast-breeder reactor, the main alternative is to blend the plutonium with other fuel to create a mixed-oxide fuel (mox) that will burn in conventional nuclear power plants. Britain has a history of embarrassing failures with mox, including the closure last year of a $2 billion blending plant that spent 10 years producing a scant amount of fuel. And critics say that, even if it works properly, mox fuel is an expensive way of generating not much energy, while leaving most of the plutonium intact, albeit in a less dangerous form. Only fast reactors can consume the plutonium. Many think that will ultimately be the UK choice. If so, the PRISM plant would take five years to license, five years to build, and could destroy probably the world's most dangerous stockpile of plutonium by the end of the 2020s.

#### Nuclear industry can absorb lack of immigration – Navy, community colleges – preferred for nuclear expertise

Kristi E. Swartz, “Nuclear industry looks to Navy to fill worker shortage,” AJC, August 24, 2012, <http://www.ajc.com/news/business/nuclear-industry-looks-to-navy-to-fill-worker-shor/nRMQ9/>, accessed 1-27-2013.

It's a "brain drain" of sorts, but it's one the nuclear power industry has been preparing for. Of the roughly 120,000 workers in the nuclear power industry, nearly 38 percent are eligible to retire within the next five years. For companies like Southern Nuclear, the expected worker shortage comes at a critical time: Southern Nuclear operates six reactors: two at Plant Farley in Alabama and two each at Plant Hatch and Plant Vogtle in Georgia. The company also will operate two new units at Vogtle when they open in 2016 and 2017. "Our issue is a little bit larger than maybe some other utilities," said Steven Kuczynski, chief executive officer for Southern Nuclear. One answer for finding trained workers has been the Navy. About 11 percent of employees at the company's parent, Atlanta-based Southern Co., are military veterans. For the nuclear unit, that percentage is higher, Kuczynski said.¶ "We rely much more heavily on nuclear skills," said Kuczynski, in an interview with The Atlanta Journal-Constitution That Navy-to-nuclear career pipeline was made formal Wednesday after industry leaders met at the Institute of Nuclear Power Operations in Atlanta. Southern Nuclear was one of a dozen nuclear power companies to agree to hire retiring naval personnel with nuclear training. The agreement also expands what's known as the Nuclear Uniform Curriculum Program to let the Navy recruit from 38 community colleges across the country. The idea of the public-private partnership is threefold. Navy veterans with nuclear training have a clear path to a new job. Utilities with nuclear plants have easy access to trained workers. And students at technical schools can start on a career in the nuclear industry by joining the Navy.A2 loan guarantees fail

#### Loan guarantees is the best way to incentivize new nuclear energy – it is given at no cost.

NEI, 2012, Nuclear Energy Institute, “New Reactor Development,” <http://www.nei.org/112thcongress/new-reactor-development/>

The NRC certified Westinghouse Electric Co.'s revised AP1000 reactor design in December 2011. The AP1000 reactor will be used at the Vogtle facility and at South Carolina Electric & Gas Co.'s V.C. Summer site in Jenkinsville, which was licensed by the NRC in March 2012. The Nuclear Regulatory Commission is reviewing 11 license applications for 18 new nuclear reactors. The new NRC licensing process moves the licensing and safety issues to the front of three processes: approval of standardized reactor designs, early site permits, and combined construction and operating licenses. In addition, the licensing process provides greater opportunity for public input at the front end of the project. Costs Electricity generated from nuclear power can be competitive with other new sources of baseload power. This is true even before including the cost impact of potential restrictions on carbon dioxide and other greenhouse gas emissions. Loan Guarantees The Department of Energy loan guarantee program is the most effective program for addressing the major challenge facing new nuclear power plants: construction financing. Loan guarantees through DOE are available for 10 technologies—including nuclear power—that reduce, sequester or avoid greenhouse gas emissions. Recipients of loan guarantees for nuclear energy projects pay a fee and cover all administrative costs incurred by the government program. There is no cost to the taxpayer.

### warming

#### Zero emissions.

Kevin Fischer, 2010, Electrical Engineering, Physics, Massachusetts Institute of Technology (MIT), Angles, “Nuclear Waste Reduction through Advanced Reactor and Fuel Cycles,” <http://web.mit.edu/angles/Kevin_Fischer.htm>

The pyroprocessing facility, conceived by the Chemical Technology Division of the Argonne National Laboratory, led by J. J. Laidler, was housed at the same site as the reactor. Their designs made it a completely remote facility requiring no human intervention. Since the plant and its operations are completely contained and isolated in a highly shielded remote facility, it is considerably safer than other plants that utilize reprocessing techniques. Furthermore, this makes the plant even more proliferation resistant.7 Along the same line of thought, the plant is a “zero-release” plant since everything, including the coolant, is self-contained.

### 2AC states CP

#### States acting now to provide incentives - won’t work without a sustained federal commitment.

Frank Bowman, 6-19-2008, a retired four-star Admiral, is the former Chief of Naval Personnel and former Director of Naval Nuclear Propulsion, an Honorary Knight Commander of the Most Excellent Order of the British Empire (KBE), Master's Degree in nuclear engineering and naval architecture/marine engineering at the Massachusetts Institute of Technology, Honorary Doctorate of Humane Letters from Duke University, CQ Congressional Testimony, “Greenhouse Gas Emission Reduction,” Lexis Nexis

In terms of new nuclear plant construction, one of the most significant financing challenges is the cost of these projects relative to the size, market value and financing capability of the companies that will build them. New nuclear power plants are expected to cost at least $6 to 7 billion. U.S. electric power companies do not have the size, financing capability or financial strength to finance new nuclear power projects on balance sheet, on their own-particularly at a time when they are investing heavily in other generating capacity, transmission and distribution infrastructure, and environmental controls. These first projects must have financing support-either loan guarantees from the federal government or assurance of investment recovery from state governments, or both. The states are doing their part. Throughout the South and Southeast, state governments have enacted legislation or implemented new regulations to encourage new nuclear plant construction. Comparable federal government commitment is essential. The modest loan guarantee program authorized by the 2005 Energy Policy Act was a small step in the right direction, but it does not represent a sufficient response to the urgent need to rebuild our critical electric power infrastructure. We believe the United States will need something similar to the Clean Energy Bank concept now under consideration by a number of members of Congress-a government corporation, modeled on the Export-Import Bank and the Overseas Private Investment Corporation, to provide loan guarantees and other forms of financing support to ensure that capital flows to clean technology deployment in the electric sector. Creation of such a financing entity should be an integral component of any climate change legislation. Such a concept serves at least two national imperatives. First, it addresses the challenge mentioned earlier-the disparity between the size of these projects relative to the size of the companies that will build them. In the absence of a concept like a Clean Energy Bank, new nuclear plants and other clean energy projects will certainly be built, but in smaller numbers over a longer period of time. Second, federal loan guarantees provide a substantial consumer benefit. A loan guarantee allows more leverage in a project's capital structure, which reduces the cost of capital, in turn reducing the cost of electricity from the project. Electricity consumers-residential, commercial and industrial-are already struggling with increases in oil, natural gas and electricity prices. The high cost of energy and fuel price volatility has already compromised the competitive position of American industry. We know that the next generation of clean energy technologies will be more costly than the capital stock in place today. In this environment, we see a compelling case for federal financing support that would reduce consumer costs. If it is structured like the loan guarantee program authorized by Title XVII of the 2005 Energy Policy Act, in which project sponsors are expected to pay the cost of the loan guarantee, such a program would be revenue-neutral and would not represent a subsidy. The public benefits associated with a robust energy loan guarantee program-lower cost electricity, deployment of clean energy technologies at the scale necessary to reduce carbon emissions-are significant. That is why the U.S. government routinely uses loan guarantee programs to support activities that serve the public good and the national interest-including shipbuilding, steelmaking, student loans, rural electrification, affordable housing, construction of critical transportation infrastructure, and for many other purposes. Achieving significant expansion of nuclear power in the United States will require stable and sustained federal and state government policies relating to nuclear energy. The new nuclear power projects now in the early stages of development will not enter service until the 2016-2020. Like all other advanced energy technologies, continued progress requires sustained policy and political support. In closing let me assure you that the U.S. nuclear industry is moving forward as quickly as we are able to license, finance and build new nuclear plants in the United States. Seventeen companies or groups of companies are preparing license applications for as many as 31 new reactors. Nine applications for construction and operating licenses are currently under review by the Nuclear Regulatory Commission for a total of 15 new plants. We expect four to eight new U.S. nuclear plants in operation by 2016 or so. Assuming those first plants are meeting their construction schedules and cost estimates, the rate of construction would accelerate thereafter. With the necessary investment stimulus and financing support, we could see approximately 20,000 MW of new nuclear capacity (that would be about 15 plants) on line in the 2020 to 2022 time frame, and 65,000 to 70,000 megawatts (or 45 to 50 plants) by 2030. These plants will produce clean, safe, reliable electricity, around the clock, at a stable price, immune to price volatility in the oil and natural gas markets.

#### Federal loan guarantees is the vital to investment in nuclear power.

Joe C. Turnage et. al, 7-2-2007, Senior Vice President, Constellation Energy Group Inc., Theodore Bunting Jr., Senior Vice President of Finance, Entergy Corp, John F Young, Executive Vice President and CFO, Exelon Corp, and Steve Winn, Executive Vice President, NRG Energy, Inc., “Join Comments of Constellation Group, Inc, Entergy Corporation, Exelon Corporation, and NRG Energy, Inc. regarding Proposed Rule, Loan Guarantees for Projects that Employ Innovative Technologies,” <http://www.lgprogram.energy.gov/nopr-comments/comment41.pdf>

Following the enactment of the Energy Policy Act of 2005, numerous companies announced plans to develop applications to be submitted to the U.S. Nuclear Regulatory Commission to obtain licenses for the development of new nuclear power generation facilities. NRC has developed a new "one step" licensing process for nuclear projects, where applicants would receive a combined construction and operating license or "COL," and it is hoped that this will provide a transparent and predictable licensing process which will be demonstrated with the first "wave" of COL applications. These projects involve new nuclear plants using advanced technologies of five advanced reactor designs that promise to be even safer and more reliable than the existing "fleet" of nuclear reactors. In this first stage of development, the companies at the leading edge of development are committing many tens of millions of dollars to the NRC licensing process for COL applications that will be submitted later this year and in 2008. NRC's review process is then expected to take 2-4 years, which would lead to full scale construction activities commencing in the 2009-2012 time-frame for the first units of each new technology type. Given the nature of the multi-year licensing and construction schedule, as well as the world-wide competition for resources required to build these nuclear plants, companies planning to build the first plants are already beginning the process of committing to these projects what will likely be the first several hundred million dollars for each multi-billion dollar project, and in some cases, companies with their project partners have already spent such amounts. This means that in the near-term, these companies will need to either secure financing or commit equity in order to maintain schedules to prepare for plant construction. Significantly, however, newly all of these efforts are premised upon the assumption that the promise of Title XVII of EP Act 2005 will be realized for the first wave of new nuclear plants. These companies strongly believe that loan guarantees are necessary to access the credit markets. In addition, for new nuclear facilities that will be subject to cost-of-service regulation, companies will need to demonstrate to state public service commissions that the financing costs for these facilities were prudently incurred. Simply put, further commitment of capital requires that companies secure confidence that DOE will develop and implement a workable loan guarantee program to provide the badly needed access to large amounts of capital necessary to finance the development of the first 3-5 plants of each of the new reactor designs. For some companies, this may require securing loan guarantee commitments as soon as 2008, shortly after NRC has accepted a COL application as "administratively complete" and "docketed" the application. At a minimum, however, this requires the clear and unambiguous availability of loan guarantees in the 2009-2012 timeframe for a significant number of capital intensive central power generation facilities (new nuclear and clean coal plants). A workable loan guarantee program necessary to support new nuclear power development in the U.S. must have the following three elements: The guarantee itself must be a commercially viable financing instrument, in line with other Federal loan guarantee instruments; There should be a transparent methodology for calculating the subsidy cost to be paid by sponsors, and such costs should be reasonable and commercially viable; and There should be certainty as to the future availability of guarantees, and this self-pay program should be insulated from the uncertainty of the annual appropriations process. The size and scale of nuclear projects, and the multi-year commitments that need to be made by private industry, make it imperative that DOE create certainty in the near-term around the future availability of the Title XVII Loan Guarantee Program for nuclear power projects. As part of the public-private partnership that has been essential to "jump-starting" the development of new, base-load nuclear generation, the multi-year commitment being made by private parties needs to be matched with a multi-year commitment from the federal government. The federal government cannot expect private parties to make hundreds of millions of dollars in commitments premised upon the expectation of they will obtain loan guarantees in 2009-2012 without reasonable progress being made by the federal government toward establishing a program that can be expected to be available to facilitate the financing of the first wave of new nuclear plants throughout the next five years.

#### Federal funds drive private investment and recruitment of skilled workers for PRISMs.

Daniel Kammen, 6-12-2003, professor of nuclear engineering at Berkeley, Federal News Service, Prepared Testimony before the House Committee on Science, Lexis Nexis

The federal government plays the pivotal role in the encouragement of innovation in the energy sector. Not only are federal funds critical, but as my work and that of others has demonstrated6, private funds generally follow areas of public sector support. One particularly useful metric although certainly not the only measure --. of the relationship between funding and innovation is based on patents. Total public sector funding and the number of patents - across all disciplines in the United States have both increased steadily over at least the past three decades (Figure 5). The situation depicted here, with steadily increasing trends for funding and results (measured imperfectly, but consistently, by patents) is not as rosy when energy R&D alone is considered. In that case the same close correlation exists, but the funding pattern has been one of decreasing resources (Figure 6A). Figure 6A shows energy funding levels (symbol: o) and patents held by the national laboratories (symbol: ). The situation need not be as bleak as it seems. During the 1980s a number of changes in U.S. patent law permitted the national laboratories to engage in patent partnerships with the private sector. This increased both the interest in developing patents, and increased the interest by the private sector in pursuing patents on energy technologies. The squares (l) in figure 6 show that overall patents in the energy sector derived. Figure 6B reveals that patent levels in the nuclear field have declined, but not only that, public private partnerships have taken placed (shaded bars), but have not increased as dramatically as in energy field overall (Figure 6A). There are a number of issues here, so a simple comparison of nuclear R&D to that on for example, fuel cells, is not appropriate. But it is a valid to explore ways to increase both the diversity of the R&D. This is a particularly important message for federal policy. Novel approaches are needed to encourage new and innovative modes of research, teaching, and industrial innovation in the nuclear energy field. To spur innovation in nuclear science a concerted effort would be needed to increase the types and levels of cooperation by universities and industries in areas that depart significantly from the current 'Generation III+' and equally, away from the 'Generation IV' designs. Similar conclusions were reached by M. Granger Morgan, head of the Engineering and Public Policy Program at Carnegie Mellon University, in his evaluation of the need for innovative in the organization and sociology of the U. S. nuclear power industry’s. A second important issue that this Committee might consider is the degree of federal support for nuclear fission relative to other nations. Funding levels in the U.S. are significantly lower than in both Japan and France. Far from recommending higher public sector funding, what is arguably a more successful strategy would be to increase the private sector support for nuclear R&D and student training fellowships. Importantly, this is precisely the sort of expanded public private partnership that has been relatively successful in the energy sector generally. It is incorrect, however, to think that this is a process that can be left to the private sector. There are key issues that inhibit private sector innovation. As one example, many nuclear operating companies have large coal assets, and thus are unlikely to push overly hard, in areas that threaten another core business. This emphasis on industry resources used to support and expanded nuclear program - under careful public sector management - has-been echoed by a variety of nuclear engineering faculty members: I believe that if you. were to survey nuclear engineering department heads, most would select a national policy to support new nuclear construction, over a policy to increase direct financial support to nuclear engineering departments. A firm commitment by the federal government, to create incentives sufficient to ensure the construction of a modest number of new nuclear plants, with the incentives reduced for subsequent plants, would be the best thing that could possibly be done for nuclear engineering education and revitalization of the national workforce for nuclear science and technology. - Professor Per Peterson, Chair, Department of Nuclear Engineering, University of California, Berkeley

#### Skilled worker shortage wrecks solvency.

Harold Bengelsdorf, 2007, consultant and former director of energy department offices, “THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY,” <http://www.nuclearcompetitiveness.org/images/COUNCIL_WHITE_PAPER_Final.pdf>

Thus the challenge the U.S. nuclear industry faces today is whether the U.S. civil nuclear infrastructure will be strong enough to support a hoped for nuclear revival in this country, which could entail the construction and commissioning of up to eight nuclear power units during the 2010 to 2017 period. Several studies have been devoted to this question, and the answer is by no means certain. The shortage in skilled labor is expected to double in this country by the year 2020 and the workforce will stop growing as the baby boomers start to retire.

#### Eliminating federal pre-emption destroys nuclear energy – small claims juries.

Donald E. Jose & Michael A. Garza, Spring 2007, Managing partner of Jose & Associates and J.D. at Georgetown, “The Complete Federal Preemption of Nuclear Safety Should Prevent Scientifically Irrational Jury Verdicts in Radiation Litigation,” Lexis Nexis

Federal law preempts radiation safety. n53 Unfortunately, the Cook judge and jury disregarded federal regulations of radiation safety. There are currently 104 NRC licensed operating nuclear reactors in the United States. n54 They provide 20% of the [\*10]nation's electricity. n55 In addition, there are 18 nuclear facilities associated with nuclear weapons production, one of which was Rocky Flats. n56 Finally, there are many nuclear fuel cycle sites where some work is done with radioactive material. n57 At some point each of these sites will be decommissioned, as Rocky Flats was, and the land transferred to other uses. The NRC allows the land upon which a nuclear power plant once stood to be decommissioned and transferred to private ownership for unrestricted uses as long as the residual radioactivity on the land (i.e. the "contamination" remaining after clean-up) would not cause a dose to a resident of the land exceeding 25 millirem per year. n58 The EPA agrees with the 25 millirem standard. n59 Yet, the Cook jury assessed half a billion dollars damages for a dose 10 times less. Obviously, a severe conflict exists between the federal regulation of nuclear safety and the Cook jury verdict. Either the federal agency with expertise backed by complete federal preemption controls the extent of decontamination required, or a lay jury can assert control through the damages they assess. Both the judgment of the federal agency and the judgment of the jury cannot be right and they cannot co-exist. One must be subjugated to the other. Either the federal agency with expertise in nuclear safety regulates clean-up to acceptable levels or the latest lay jury award effectively regulates through monetary damages, and perhaps destroys n60 the nuclear industry.

#### Needs centralized planning for investors to target energy needs.

Gene Preston, 4-15-2012, CEO at Transmission Adequacy Consulting, Manager System Planning at Austin Energy, Ph.D. and P.E. from the University of Texas in Electrical Engineering and physics, http://bravenewclimate.com/2012/04/12/the-nuclear-energy-solution/

The problem with electric markets in the US is that they have no long term outlook. The biddings for power sales extend into the future as far as the next Ipad model at Walmart, which is a few months at the most. You can’t build the equivalent of an Egyptian pyramid or Great Wall of China on such a short time scale. Our markets operate on the principle that if there are batches of trees to exploit, we should go cut them down and sell them immediately, and to heck with the next decade. So how do we pay for nuclear power plants? If the government ran the entire operation from conception to construction to operation to mothballing, then the financing and planning could be long term and being centralized it would all be coordinated. Ah, but this doesn’t allow the JP Morgan types to make money, because they would not own the nuclear resource. So here in the US the government has gotten out of the nuclear business. It doesn’t even want to deal with the waste issue. So let’s think for a moment. Investors are not interested in getting returns from their investments so far into the future so they aren’t interested in nuclear power. Most utilities are not interested in taking such a large financial risk so they aren’t interested in large nuclear plants. And individual customers don’t know how to invest or cannot invest in their own power supplies, either long term or short term. So there you have it. The reason we are not building nuclear plants is because there is no structure in place in the US to support the financing of large capital investments that pay off big time in the future.

### 2AC hafnium DA

#### Plan doesn’t create a shortage – compact reactors require little hafnium and when we need it we just separate it from zirconium.

Rod Adams, 7-27-2012, Pro-nuclear advocate with small nuclear plant operating and design experience, former submarine Engineer Officer. Founder, Adams Atomic Engines, Inc., Atomic Insights, “Does “highly” enriched uranium make it easier to build more compact reactors?,” <http://atomicinsights.com/2012/07/does-highly-enriched-uranium-make-it-easier-to-build-more-compact-reactors.html>

It is easier to design and build compact nuclear reactors with uranium that has a higher fraction of U-235. The higher the U-235 content, the easier it is to overcome the effects of impurities in the coolant and cladding and the easier it is to overcome the inevitable effects of fission products that absorb neutrons. There is nothing secret about this fact; it is obvious from studying the history of nuclear reactor technology development. There are readily available examples related to university research reactors, the compact reactors built by the US Army, the Soviet era space reactors, and even the general knowledge that Rickover based his submarine reactors on highly enriched uranium – otherwise known Aside: This is a serious topic, so I want to lighten it up by sharing a photo that I took at a Veteran’s Administration hospital while I was going through my exit physicals from the US Navy. As an atomic advocate who knows how sensitive people can be about discussing HEU, and as a man who works hard to avoid acronyms, I was amused. End Aside. One of the reasons that I decided to include the above aside with a humorous HEU sign is that I want to challenge you to think about the political and economic implications associated with the arbitrary definition of highly enriched uranium. According to the internationally accepted political definition, any uranium that contains 20% or more fissile uranium (U-235) is considered to be HEU. At that level, all kinds of material restrictions kick in. The world has spent enormous sums of money developing sophisticated new research reactor fuels in order to replace the simple aluminium clad fuels that were the basis for research reactors for the first three decades or so of the Atoms for Peace era. The ostensible reason for the line at 20% is that anything greater makes it too easy for a dedicated weapons developer to build a functional explosive device. However, that limitation has also hampered or outright prevented a number of valuable technology innovations. In addition, it has successfully raised the barrier to entry for any nation that would like to develop its own profitable nuclear fuel manufacturing capability. While it is obviously possible to build large functional reactors using lower enrichments, small reactor designers have to overcome a number of challenges to build a reactor that can reliably produce heat to serve a variable load. If a reactor designer wants to produce a system to serve isolated loads, they have to design something that can power its way through xenon transients during a reasonably chosen fuel lifetime. It is a less costly challenge to overcome with a higher concentration of fissile material that does not lose a large portion of the produced neutrons in absorption in fertile material. Doing that with lower enrichments requires some design and material sophistication. I do not know the technical details as well as some people, but I understand that lower enriched fuels require cladding that has a tiny neutron cross section. One of the more popular choices has been extremely pure zirconium alloys; zirconium has a low affinity for absorbing valuable neutrons, but it is naturally contaminated with hafnium, a strong neutron absorber. Separating hafnium from zirconium is a well-established technology, but the people who own the intellectual property chose not to share it.

#### Fast reactors don’t cause shortages of Hafnium – fewer rods.

Barry Brook et. al, 2-21-2009, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, George S. Stanford is a nuclear reactor physicist, part of the team that developed the Integral Fast Reactor, PhD from Stanford University in Physics, Masters from University of Virginia in Engineering, worked at Argonne National Laboratory, Graham R.L. Cowan, "Boron: A Better Energy Carrier than Hydrogen?" in 2001, published "How Fire Can Be Tamed," BraveNewClimate, “Response to an Integral Fast Reactor (IFR) critique,” <http://bravenewclimate.com/2009/02/21/response-to-an-integral-fast-reactor-ifr-critique/>

A new IFR should cost less than either a new nuclear (typical of today’s technology) or coal plant based on the following. The IFR does not require some of the complex systems that today’s reactors require. Examples include the low level radwaste cleanup station, the emergency core cooling system, and fewer control rod drives and control rods for comparable power. Because of the low pressure in the sodium systems, less steel is required for the plant piping and reactor vessel. There are studies that suggest that the reactor containment will be less massive. Other cost savings will be made because the IFR does not require the services of the Isotopic Separation Plants for fuel enrichment. Additional costs to the IFR include the integral fuel reprocessing capability, and a secondary sodium system (but the IFR fuel process costs are somewhat offset by the extremely low cost for raw fuel and the improved waste product). Some studies have been done which indicate that an IFR would be very economical and competitive to build, own, and operate, but the final proof of economics can only come in the construction and operation of a commercial sized plant.”

#### We’ve innovated beyond Hafnium – carbon tubing.

Wolfgang Gruener, 10-31-2012, Tom’s Hardware, “IBM Proposes Carbon Nanotubes Instead of Silicon for Chips,” [http://www.tomshardware.com/news/ibm-science-transistor-processor-carbon,18797.html](http://www.tomshardware.com/news/ibm-science-transistor-processor-carbon%2C18797.html)

IBM researchers believe to have found a way to overcome the physical limitations to shrink silicon in future computer chips. The company suggests that carbon nanotubes are key to smaller transistors as the material may be able to replace silicon at some point. According to the company, it was able to produce "10,000 working transistors made of nano-sized tubes of carbon" and place them "precisely" on a single chip using "standard semiconductor processes". The placement density was one billion carbon nanotubes per square centimeter. Of course, 10,000 transistors are a far cry from the more than 1 billion transistors that are placed on today's CPUs. The precision rate of 99.8 percent appears to be close to the required 99.999 percent to achieve 1 billion transistors, but those extra 0.199 percent are more difficult to achieve than the previous 99.8 percent .Nevertheless, IBM's announcement is remarkable and the company states that there is reason to believe that carbon nanotube transistors are likely to "replace and outperform silicon technology". In its research, IBM said it was able to position the carbon transistors by creating a circuit pattern on a substrate using a chemically-modified hafnium oxide (HfO2) and the rest of silicon oxide (SiO2). The added carbon nanotubes attached themselves to the HfO2via a "chemical bond", IBM said.

#### Plan key to aerospace involvement.

Michael Wallace & Sarah Williams, 2012, head of the Transatlantic Program at the Royal United Services Institute, and Sarah Williams, program coordinator and research associate in the U.S. Nuclear Energy Project at CSIS, “Nuclear Energy in America: Preventing its Early Demise,” CSIS

Second, setting global norms and standards for safety, security, operations, and emergency response. As the world learned with past nuclear accidents and more recently with Fukushima, a major accident anywhere can have lasting repercussions everywhere. As with nonproliferation and security, America’s ability to exert leadership and influence in this area is directly linked to the strength of our domestic industry and our active involvement in the global nuclear enterprise. A strong domestic civilian industry and regulatory structure have immediate national security significance in that they help support the nuclear capabilities of the U.S. Navy, national laboratories, weapons complex, and research institutions.

#### Aerospace industry is resilient – past challenges prove.

Erik Skie, 9-6-2012, Manufacturing and Distribution Managing Partner, CliftonLarsonAllen, “Survey Shows Resilient Manufacturing Sector Is Adapting to New Environment,” <http://www.cliftonlarsonallen.com/Manufacturing/Survey-Shows-Resilient-Manufacturing-Sector-Is-Adapting-to-New-Environment.aspx>

Over the last several decades, U.S. manufacturers have faced an onslaught of challenges that had led many to predict the eventual demise of U.S. manufacturing. As recently as five years ago, the conventional wisdom was that the United States could not compete with the low labor costs in countries like China, Vietnam, and India. In addition, purchasing tactics like those implemented by the “big three” auto companies underscored the perspective that life as a manufacturer would be precarious at best. The dynamic shifts in this industry are almost unparalleled in any other sector of our economy. Interestingly, though, in a recent survey of almost 400 small to mid-sized manufacturers across the country, most have returned to financial stability after the Great Recession and are focused on future opportunities. Stiff competition has produced a U.S. manufacturing base that is innovative, adaptable, and resilient in the face of adversity. Since August 2009, the Institute of Supply Chain Management’s (ISM) Manufacturing Production Index (PMI), a measure of manufacturing activity in the United States, has shown expansion for 33 of the past 35 months. Here are some survey respondents’ observations on opportunities and challenges in today’s manufacturing industry.Expanding domestic salesOver the past decade the trend has been to send work to low cost-producers overseas. However, the anticipated profit improvements of off-shoring, which are primarily driven by lower wages, have sometimes been elusive due to collateral issues like longer lead times, less flexibility, and the need to carry more inventory. While there is still a clear role for overseas production, more companies have turned to re-shoring in the past 24 months for their more complex, design intensive, lower volume, and higher mix products. The need for supply chain intimacy is creating renewed demand for flexible, responsive U.S. domestic production.International sales The U.S. manufacturing base has been the home for tremendous product innovations for many years. As globalization has increased, the middle class in places like China is growing rapidly and turning a once producer-only economy into a nation of consumers. China’s increased consumption of U.S. brands and technology has been a blessing for U.S. manufacturers like General Motors. The aerospace industry is benefitting as well, with Boeing seeing significant backlog for their products in China.

#### NASA has already secured its supply chain – no collapse in future supply.

Michael Galluzzi, 3-5-2012, Supply Chain Manager, NASA, “NASA Supply Chain Challenge: Maintaining the Vitality of its Space Industrial Base,” <http://www.usresilienceproject.org/workshop/participants/pdfs/USRP_NASA_CS_030512.pdf>

Finally, the implementation of a Space Commerce Network known as a Virtual Design andManufacturing Cluster (VDMC) could provide an opportunity to “rescue” industrial resources in danger of being terminated. The concept is that the burden on the U.S. manufacturing basecan be reduced substantially by developing standardized processes for collaborative forecastdemand planning, by standardizing agencies’ hardware requirements and processes, and byallowing for better visibility of hardware demands.A VDMC is a new manufacturing business model that uses a shared physical and virtualinfrastructure (hardware, software, facilities and services) to reduce costs and uses network-centric technologies and product- and service-oriented architectures to facilitate the smartdesign, rapid assembly, and seamless coordination of dynamic supply chains to accelerateproduction, reduce costs, and mitigate risk.A VDMC is much like traditional company-focused “supplier cities” created by Toyota and otherlarge companies to reduce inventory costs and increase efficiencies. A VDMC does the same.However, a VDMC is different from the traditional supplier city in three fundamental ways:1. Demand aggregation. A VDMC is not driven by the purchasing volume commitments of asingle large company. Instead, the demand is aggregated from different buyers, ranging from commercial companies to government agencies. Because the demand is aggregated, buyersthat may not have been able to generate enough demand on their own can support the vitalityof the industrial base.2. Infrastructure. VDMC infrastructure is not dedicated to a particular customer’s systems.Instead, VDMC infrastructure is a combination of technologies, standards, and processes that allow both buyers and suppliers to connect their existing systems to a common backbone.This allows for the sharing of information throughout the supply chain, regardless of disparate software technologies. The potential impact from this type of manufacturing coordinationinfrastructure is significant. In addition to reducing the cost for buyers and suppliers toconnect, VDMC infrastructure opens the door for new efficiencies: linking suppliers; enablingbuyers and suppliers to collaborate on manufacturability issues; and providing visibility intothe manufacturing process throughout the supply chain while also providing visibility topreviously unknown sources and capabilities, including gaps in production capability of criticaltechnologies.3. Shared facilities. Traditional supplier cities typically require suppliers to invest in buildings,equipment, and so on. The large customer behind a supplier city will sometimes contributeland or shared utilities, but most of the cost is borne by the suppliers. A VDMC differs inthat it typically has, at its core, buildings already equipped with advanced and expensivemanufacturing equipment. These buildings are often made available to regional groups, suchas economic development organizations, by large companies or by government agenciesthat no longer need the facilities. In many cases, economic development organizationshave obtained government monies to update these facilities and outfit them with newequipment. These facilities, such as NASA’s Michaud Assembly Facility in Louisiana which ismanaged by NASA’s National Center for Advanced Manufacturing, may already have large, expensive equipment that small- to medium-size manufacturers could not afford on their own. By sharing facilities, many suppliers can capture business opportunities they mightnot otherwise. Whether available on a time-and-materials basis or as part of a permanentresidency, suppliers can leverage this capital-intensive equipment, along with their own, toexpand their offerings.The intent is that manufacturers will have access to shared tooling, an associated workforce,manufacturing training, commercial financing, foreign trade zone benefits, a lower corporatetax base and an advanced-skill labor pool at no upfront direct cost to the small-to-mediumenterprises. This approach is intended to strengthen the U.S. aerospace and defense industrial base.

### 2AC politics DA

#### CIR not key to the economy.

Jack Martin, April 2009 Special Projects Director at the Federation for American Immigration Reform Amnesty & the Economy: Myths, Lies & Obfuscation http://www.fairus.org/site/DocServer/amnesty\_economy.pdf

Recognizing that today’s economic conditions and climbing unemployment are a deterrent to any consideration of immigration amnesty legislation, amnesty advocates are trying to persuade the public and Members of Congress that an amnesty for illegal aliens would help the economy. For example, the Immigration Policy Center (IPC) recently issued a report that argues that, “Without comprehensive reform of the immigration system [read amnesty for illegal aliens], our nation cannot experience a full economic recovery.”1 If bold, baseless assertions such as these would win the immigration debate, the debate would be over. This argument spins a fantasyland out of partial and misleading data. Here is how they do it. ECONOMIC RECOVERY REQUIRES AMNESTY FOR ILLEGAL ALIENS? The first assertion of the IPC polemic describes a revenue panacea for the government if an amnesty is enacted. “The 2007 immigration reform bill, which included a legalization program, would have more than paid for itself through increased tax revenue. The CBO and JCT estimated that the Comprehensive Immigration Reform Act of 2007, as amended by the Senate through May 24, 2007, would have generated $48 billion in new revenue during 2008-2017, primarily through Social Security payroll taxes. • The additional revenue would have more than offset the estimated $23 billion in new “direct spending” on refundable income tax credits and Medicaid during 2008-2017. • The extra revenue would have partially offset the $43 billion in new “discretionary spending” on immigration enforcement during 2008-2017.” Read that again. The estimate is that a “legalization” program would cost $23 billion in direct spending and $43 billion in discretionary spending for a total cost of $66 billion and would generate $48 billion in new revenue. So the difference — a deficit of $18 billion — “would have more than paid for itself.” Moral: stating that down is up does not make it so. An analysis by the Center for Budget and Policy Priorities of the same CBO projection noted: “The legislation would increase the unified federal budget deficit by only ‘several billion dollars a year’ by 2027…”2 Although that estimate may understate the net fiscal cost, at least it recognized that it would a revenue loser, not a bonus for the federal government. Aside from the wishful thinking about the impact on the federal budget, the IPC ignores the much greater fiscal impact that amnesty would have at the state and local level. The Federation for American Immigration Reform (FAIR) explained this impact with regard to the earlier CBO estimate of the impact of the 2006 Senate amnesty bill: “An estimate of the fiscal impact at the local level by FAIR identifies a cost of $70 billion per year by 2020, primarily for education and health care. The $70 billion annual price tag does not include a number of other likely cost increases for programs such as assisted housing and other social welfare programs.”3 In addition, because the formal CBO estimate is for the ten-year period after adoption of the legislation, the estimate focuses on the early effects when the newly legalized aliens currently are precluded by law from using federal welfare programs.Therefore, it does not include the delayed impact. The CBO acknowledged this issue in its report. “This [the increase in the budget deficit] would happen because, the net cost of the legislation would grow after 2017, as more of the affected immigrants became eligible for benefits and the per capita cost of benefits rose…”4

#### Won’t pass -

#### CIR won’t pass because there’s no legislative language.

WTVY, 1-28-2013, “Sessions: Comprehensive Reform Won’t Pass As Long As Admin Defies Existing Immigration Law,” <http://www.wtvy.com/home/headlines/Sessions-Comprehensive-Reform-Wont-Pass-As-Long-As-Admin-Defies-Existing-Immigration-Law-188735161.html>

U.S. Sen. Jeff Sessions (R-AL), Ranking Member of the Senate Budget Committee and former Ranking Member of the Senate Judiciary Committee, issued the following statement on the new push for comprehensive immigration reform and amnesty: “Americans overwhelmingly oppose illegal immigration. They have pleaded with Congress to end the mass illegality for decades to little avail. All the while, millions have been added to the total of those illegally here. It’s time to fix that broken system. Now we are told that the Obama Administration and members of Congress say they have a plan that they promise will do the job. So, the American people will need to watch closely. And, members of Congress must insist that they have a full and complete opportunity to study and amend such legislation. We would be in a much better position to achieve immigration reform if the Obama Administration had spent that last four years enforcing federal law rather than dismantling it. Brave immigration agents have been left with no recourse but to sue their own Department head, simply so that they—like any other law officers—will be allowed to do their jobs. Just last Friday a federal judge made an important preliminary ruling in their favor. The ICE union also held their own agency head, John Morton, in no confidence with a unanimous vote. The first task for every media agency in the country ought to be to study this lawsuit, to listen to the long-documented complaints of ICE agents, and to review the record of stymied attempts at congressional oversight of DHS. No comprehensive plan can pass Congress as long as this administration continues to defy existing federal law. What good are promises of future enforcement when the Administration covertly undermines those laws now in place? Yet, without consulting the law officers who have the duty to enforce the law, another group of senators, meeting in secret—just like the last time comprehensive reform failed—have set forth an outline with no legislative language. We have seen too often before that the promises made by bill sponsors do not match up to the reality when the language is produced. No secret accord with profound consequences for this nation’s future can be rushed through. That means a full committee process and debate and amendments on the floor of the Senate. Several points need to be understood. Amnesty will not help balance our budget. In fact, a large-scale amnesty is likely to add trillions of dollars to the debt over time, accelerate Medicare’s and Social Security’s slide into insolvency, and put enormous strain on our public assistance programs.

#### Obama involvement poisons the well.

Silvio Canto, Jr., 2-3-2012, American Thinker, “President Obama wants immigration reform to fail so that he can blame the GOP,” <http://www.americanthinker.com/blog/2013/02/president_obama_wants_immigration_reform_to_fail_so_that_he_can_blame_the_gop.html>

President Obama just signaled that he is not interested in immigration reform. He just told us that he wants a pathway to citizenship rather than working with the bipartisan deal that includes border security, guest worker visas and ultimately a path to legalization. President Obama wants a path to citizenship right away and did not mention "guest worker visas" in his speech. He has to know that those are "poison pills" for many Republicans, including the 4 Senators who are part of the compromise. What's President Obama up to? He wants immigration reform to fail. He wants to propose unrealistic plans and blame "los terrible republicanos" again. Most of all, he does not want an "up or down" vote because that will show that a lot of Democrats are uncomfortable with immigration reform too. Remember The Dream Act vote of 2010 that did not pass because of Senate Democrats? The Democrats have always been uncomfortable with "guest worker" visas. It won't be any different this time around when we get into details. Let's hope that Senator Rubio and the others understand who they are negotiating with. Unlike President Bush in 2007, who was committed to a bipartisan solution, President Obama is not. He wants the issue, the distraction and the opportunity to give a lot of meaningless "5 de Mayo" speeches proposing reforms without specifics. President Obama has one objective: He wants "hispanos" to show up in 2014 so that the Democrats have a chance to keep the US Senate and pick up the House. Without Hispanos, the GOP will do well in 2014 especially if we keep learning about the real cost of Obama-Care. Yes, President Obama does not want Hispanos talking about Obama-Care, a stagnant economy and the massive deficits that their children are about to inherit. Again, President Obama wants to distract Hispanos and blame the failure of immigration on "los terrible, racista y anti-imigrante republicanos".I hope that Senator Rubio understands that he is doing business with a first class demagogue in permanent campaign mode rather than a serious leader who wants solutions.

#### No trade-off – too much time.

UPI.com, 2-1-2013, “Senate won't rush immigration bill,” [www.upi.com/Top\_News/US/2013/02/01/Senate-wont-rush-immigration-bill/UPI-31311359732926/?spt=hs&or=tn](http://www.upi.com/Top_News/US/2013/02/01/Senate-wont-rush-immigration-bill/UPI-31311359732926/?spt=hs&or=tn)

Senate will not rush an immigration bill through and will instead put it through the traditional committee process, Democratic lawmakers say. Senate Majority Leader Harry Reid, D-Nev., said Thursday a full-fledged debate on immigration reform will be scheduled and a decision on the bill may not be reached until later this year, the Los Angeles Times reported. "This time we're going to get Republican votes," Reid said, adding that the Senate would try to "legislate the way we are supposed to legislate." In 2007, the Senate failed to pass an immigration bill that faced strong opposition from Senate Republicans who felt they were hit unexpectedly by the bill. "It was a mistake not to go through committee process the last time, as difficult as it is," said Sen. Charles E. Schumer, D-N.Y., who was a part of the immigration task force in 2007. "One of our goals is to pass this not with 60 votes — we want a large number of Republicans to vote for this because we think that will encourage the House to go forward and pass a bill." A key issue dividing Congress along party lines is agreeing on conditions to be met before illegal immigrants could be put on the path to citizenship, The Washington Post reported. A path to citizenship is "certainly going to be a problem in the House," said Rep. Bob Goodlatte, R-Va., chairman of the Judiciary Committee, which will hold a hearing next week on the issue. "There are a lot of options between deporting 11 million people, which most people don't believe will happen, and giving [them] citizenship." Meanwhile, President Barack Obama has urged Congress to act in a "timely fashion."

#### Partisanship and other items on the agenda thump reform.

Richard Cowan, 2-5-2013, “House Republicans try to chip away at immigration reform,” <http://www.reuters.com/article/2013/02/06/us-usa-immigration-idUSBRE9130V620130206>

The first major immigration reform effort since 1986 came under attack on Tuesday from congressional Republicans who cast doubt on a proposal backed by President Barack Obama to give 11 million illegal immigrants a chance to become citizens. An immigration overhaul suddenly looked possible last week when a group of senators from both parties launched a reform campaign. But it has not taken long for partisan rancor to emerge. Republicans in the House of Representatives are questioning a core element of the immigration plan: a path to citizenship for undocumented residents, most of them Hispanic, who are already in the United States. Bob Goodlatte, Republican chairman of the Judiciary Committee, raised the possibility of a "middle ground" between the current U.S. policy of deporting illegals and of placing them on a path to citizenship, as Obama demands." Are there options to consider between the extremes of mass deportation and pathway to citizenship?" the Virginia lawmaker asked during a session on immigration reform. Any challenge to the Democrats' goal of providing a route to citizenship might derail reform at a time when other divisive issues like gun control and deficit reduction share the legislative agenda. Some House Republicans are wary of a repeat of the last big immigration push in 1986, when about 3 million illegal immigrants were granted legal status. At the time, proponents of the overhaul said it would stem the flow of undocumented people across the Mexican border. But illegal immigration just got worse.

#### Gun control thumps

AP, 2-8-2013, “Keystone of Obama gun control plan gains steam as Dem, GOP senators seek background check pact,” Washington Post, http://www.washingtonpost.com/politics/congress/dem-gop-senators-quietly-seek-background-check-deal-that-could-improve-gun-control-prospects/2013/02/08/5362c63a-71cb-11e2-b3f3-b263d708ca37\_story.html

A cornerstone of President Barack Obama’s drive to check gun violence is gathering bipartisan steam as four senators, including two of the National Rifle Association’s congressional champions, privately seek compromise on requiring far more firearms purchasers to undergo background checks. The talks are being held even as Obama’s call to ban assault weapons and high-capacity ammunition magazines, the two other major pillars of his plan, are hitting rough waters on Capitol Hill. An agreement among the four senators to expand background checks would add significant impetus to that high-profile proposal by getting the endorsement of a group that ranges from one of the Senate’s most liberal Democrats to one of its most conservative Republicans.

#### The plan would be a political motivator for nuclear power development – solves the waste issue.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

Light-water reactors (LWR) of any stripe, however, produce only a tiny fraction of the potential energy in uranium, less than 1%. Fast reactors, in contrast, unlock nearly all of it. The IFR, with its metal-fuel system and pyroprocessing, is able to utilize the actinides to such an extent as to essentially solve the waste problem by reducing the radiological toxicity of the waste products from hundreds of thousands of years to a mere few hundred years. Even if the “million-year problem” of LWR spent fuel is more a political than a technical challenge (given the small volume of the waste stream), nevertheless the issue of public perception of that issue is the one that guides nuclear policy in many countries [14]. As such, the transition to fast reactors and a closed nuclear fuel cycle is both a technical advancement and a political enabler for nuclear power of all kinds.

#### Democrats will use the plan as a bargaining chip to overcome opposition.

Mariah Blake, January/February 2010, is an editor at the Washington Monthly; her work has also appeared in Christian Science Monitor and Foreign Policy, Mother Jones, “The Bailout Goes Nuclear,” <http://www.motherjones.com/environment/2010/01/bailout-nuclear>

Key Senate Democrats have signaled that they are willing to use nuclear subsidies as a bargaining chip to overcome Republican opposition. The Nuclear Energy Institute (NEI), the industry's main lobby, is pushing for at least $100 billion in federal loan guarantees—a dicey proposition given that the Congressional Budget Office has determined that the risk of default would be "well above 50 percent." This raises the question: Will the cost of passing a climate bill be a massive, taxpayer-funded nuclear bailout? The public has rescued the industry once before. The last batch of reactors built in the US during the 1970s and '80s was plagued by a series of boondoggles, one of the most infamous being Long Island's Shoreham Nuclear Power Plant, which took 20 years to build and cost $6 billion—more than 80 times the original estimate—but was never put into commercial operation. Similar debacles pushed utilities into bankruptcy, triggered the largest municipal bond default in US history, and helped cause a sixfold increase in wholesale electricity prices. The total cost to the public, in rate hikes and taxpayer bailouts, was more than $300 billion (in 2006 dollars), according to the Union of Concerned Scientists. Since that time, the industry says it has solved its cost problem, partly by engineering reactors that are simpler and less expensive to build. But the first two next-generation reactors, which are under construction in Finland and France, have been bogged down in multibillion-dollar cost overruns. Meanwhile, the projected cost of building new nuclear plants in the US is soaring: As recently as 2005, the NEI claimed new reactors could be constructed for roughly $2 billion. Newer estimates, including one by Moody's, the credit ratings agency, put the cost as high as $12 billion. That would make nuclear power more expensive on a watt-for-watt basis than most large-scale renewable energy sources, including wind, biomass, and hydropower. No wonder the industry has found it impossible to secure private-sector financing for the 28 reactors that are currently in the pipeline across the nation. Investors "will not accept the economic risk of building new reactors," says Peter Bradford, a former member of the Nuclear Regulatory Commission who is now a professor at Vermont Law School. "There will be no nuclear renaissance beyond what the government is willing to underwrite. "No one understands this better than the industry itself, which is lobbying for a Senate bill to create a Clean Energy Deployment Administration (CEDA) within the Department of Energy (DOE) that would have the authority to award a virtually unlimited number of loan guarantees—without congressional review. "It's a nuclear slush fund," says Michele Boyd, director of Physicians for Social Responsibility's safe energy program, "though the way the bill is written, even many Senate staffers don't know it." The legislation, which is likely to be folded into the climate bill, was sponsored by Sen. Jeff Bingaman (D-N.M.) and crafted with the help of Sen. Lisa Murkowski (R-Alaska). Both lawmakers are top recipients of the nuclear industry's campaign largesse. Under the policy, companies would have to pay an as yet unspecified subsidy fee in order to get loan guarantees, but these payments are all but certain to be dwarfed by the cost of defaults. According to the Union of Concerned Scientists, if 100 new plants are built, as key Republican lawmakers have called for, the price of bad loans could total at least $360 billion—and that's assuming zero cost overruns. The ceda provision builds on the work of Sen. Pete Domenici (R-N.M.), who until his retirement in January 2009 was the Senate's most tireless nuclear crusader. During his reign as chairman of the energy committee from 2003 to 2007, he packed the committee staff with former nuclear-power lobbyists—a clique dubbed "the glow-in-the-dark crew" by some of their Senate colleagues—who shepherded through Congress the Energy Policy Act of 2005. Among other things, the bill provided $13 billion in nuclear subsidies and federal loan guarantees to cover 80 percent of the costs of building low-carbon nuclear technologies, including new reactors. For any other industry, this would have been an enormous victory. But for nuclear, even these generous subsidies weren't enough. In July 2007, six of the nation's largest financial firms—including Citigroup, Lehman Brothers, and Goldman Sachs, companies hardly averse to risky investments—informed the DOE in a letter that nuclear projects would not find financing because they were too chancy. Unless, of course, the agency (which had interpreted the new law to mean 80 percent of project debt) would rewrite the rules so that 100 percent of the debt was covered—foisting almost all of the risk on taxpayers. By the end of 2007, the nuclear lobby had succeeded in getting the DOE to make exactly these changes. But to the industry's dismay, Congress has so far given the DOE authority to distribute $18.5 billion in loan guarantees for nuclear power facilities. That's less than half what UniStar hopes to spend on its four plants, not to mention the needs of the industry at large. So the industry began pushing to increase the funding and simultaneously exempt the program from congressional oversight. Part of NEI's strategy for getting the feds to hand out loan guarantees more freely has been to win over Democrats—who have traditionally been less friendly to nuclear power—by enlisting the help of organized labor. In mid-2008, the group added Michael Mathis and Charles Harple, previously top in-house lobbyists for the International Brotherhood of Teamsters, to its K Street bench. NEI also forged an alliance with the AFL-CIO. At NEI's annual conference in 2008, Mark Ayers, the AFL-CIO's president of Building and Construction Trades, said that in exchange for the industry's commitment to use union labor, his organization would work to "persuade the new majority in Congress about the need for extending and increasing the loan guarantee program." The industry's efforts began to pay off this fall, as nuclear subsidies emerged as the key to wooing Republican votes for a Senate climate bill—votes necessary to offset defections from coal-state Democrats. Since October, Sen. John Kerry (D-Mass.), one of the climate bill's sponsors, has been holding closed-door meetings with Republicans to craft nuclear language. "You listen to the rhetoric around this place and there is no one who will say a disparaging word about nuclear," says a senior Democractic Senate staffer close to the climate bill talks. "They have enough political muscle and enough support across the aisle that I think they will get all the loan guarantees they need."

#### Loan guarantees specifically popular to both sides of the aisle because of lower tax liability.

Sharon Squassoni, November 2009, is a senior associate at the Carnegie Endowment for International Peace in the nonprolifera-tion program. Prior to joining Carnegie, she held various positions in the US government, including at the Congressional research Service, the Arms Control and Disarmament Agency, and the US State Department, is a frequent contributor to journals, magazines and books on nuclear proliferation and defense, The Centre for International Governance Innovation, No. 7, “The US Nuclear Industry: Current Status and Prospects under the Obama Administration,” p. 8, <http://www.carnegieendowment.org/files/Nuclear_Energy_7_0.pdf>

The single most important spur to build new reactors in the United States is loan guarantees. In fact, industry sources indicate they are so critical that new plants may not be built without them. These guarantees are attractive to the US Congress because they offer a way to influence markets and incentivize specific projects, and because they are “scored” as a lower liability for the taxpayer than the actual amount. Thus, a potential US$50 billion in loan guarantees could be scored by the Congressional Budget Office as only costing the taxpayer US$500 million. As originally proposed in the Energy Policy Act (EPACT) of 2005, loan guarantees would only have applied to nuclear power, but this was broadened to apply to a wide range of “innovative energy technologies,” including renewable energy technologies, which further extends their attractiveness within Congress.

#### Nuclear makes it distinct to Congress.

Jim Snyder, 9-14-2012, Bloomberg, “Republican-Led House Passes Bill to Block Energy Loans,” <http://www.bloomberg.com/news/2012-09-14/republican-led-house-passes-bill-to-block-energy-loans.html>

The U.S. House passed legislation to end an energy loan-guarantee program, the culmination of a Republican-led investigation into the collapse of solar-panel maker Solyndra LLC last year. The “No More Solyndras Act,” adopted by a 245-161 vote, wouldn’t immediately halt the loan program. It would prevent the Energy Department from considering applications for government backing submitted since Dec. 31. With $34 billion in loan authority remaining, Democrats said the bill would let nuclear- power projects favored by Republicans go forward.

#### Political capital theory not true, but winners-win is\*\*\*

Michael Hirsh, 2-7-2013, is chief correspondent for National Journal, he also contributes to 2012 Decoded, previously served as the senior editor and national economics correspondent for Newsweek, based in its Washington bureau, was also Newsweek’s Washington web editor and authored a weekly column for Newsweek.com, NationalJournal, “There’s No Such Thing as Political Capital,” <http://www.nationaljournal.com/magazine/there-s-no-such-thing-as-political-capital-20130207>

\*\*\*cites George Edwards, a presidential scholar at Texas A&M University, Richard Bensel, a government professor at Cornell University, and Norman Ornstein of the American Enterprise Institute\*\*\*

On Tuesday, in his State of the Union address, President Obama will do what every president does this time of year. For about 60 minutes, he will lay out a sprawling and ambitious wish list highlighted by gun control and immigration reform, climate change and debt reduction. In response, the pundits will do what they always do this time of year: They will talk about how unrealistic most of the proposals are, discussions often informed by sagacious reckonings of how much “political capital” Obama possesses to push his program through. Most of this talk will have no bearing on what actually happens over the next four years. Consider this: Three months ago, just before the November election, if someone had talked seriously about Obama having enough political capital to oversee passage of both immigration reform and gun-control legislation at the beginning of his second term—even after winning the election by 4 percentage points and 5 million votes (the actual final tally)—this person would have been called crazy and stripped of his pundit’s license. (It doesn’t exist, but it ought to.) In his first term, in a starkly polarized country, the president had been so frustrated by GOP resistance that he finally issued a limited executive order last August permitting immigrants who entered the country illegally as children to work without fear of deportation for at least two years. Obama didn’t dare to even bring up gun control, a Democratic “third rail” that has cost the party elections and that actually might have been even less popular on the right than the president’s health care law. And yet, for reasons that have very little to do with Obama’s personal prestige or popularity—variously put in terms of a “mandate” or “political capital”—chances are fair that both will now happen. What changed? In the case of gun control, of course, it wasn’t the election. It was the horror of the 20 first-graders who were slaughtered in Newtown, Conn., in mid-December. The sickening reality of little girls and boys riddled with bullets from a high-capacity assault weapon seemed to precipitate a sudden tipping point in the national conscience. One thing changed after another. Wayne LaPierre of the National Rifle Association marginalized himself with poorly chosen comments soon after the massacre. The pro-gun lobby, once a phalanx of opposition, began to fissure into reasonables and crazies. Former Rep. Gabrielle Giffords, D-Ariz., who was shot in the head two years ago and is still struggling to speak and walk, started a PAC with her husband to appeal to the moderate middle of gun owners. Then she gave riveting and poignant testimony to the Senate, challenging lawmakers: “Be bold.” As a result, momentum has appeared to build around some kind of a plan to curtail sales of the most dangerous weapons and ammunition and the way people are permitted to buy them. It’s impossible to say now whether such a bill will pass and, if it does, whether it will make anything more than cosmetic changes to gun laws. But one thing is clear: The political tectonics have shifted dramatically in very little time. Whole new possibilities exist now that didn’t a few weeks ago. Meanwhile, the Republican members of the Senate’s so-called Gang of Eight are pushing hard for a new spirit of compromise on immigration reform, a sharp change after an election year in which the GOP standard-bearer declared he would make life so miserable for the 11 million illegal immigrants in the U.S. that they would “self-deport.” But this turnaround has very little to do with Obama’s personal influence—his political mandate, as it were. It has almost entirely to do with just two numbers: 71 and 27. That’s 71 percent for Obama, 27 percent for Mitt Romney, the breakdown of the Hispanic vote in the 2012 presidential election. Obama drove home his advantage by giving a speech on immigration reform on Jan. 29 at a Hispanic-dominated high school in Nevada, a swing state he won by a surprising 8 percentage points in November. But the movement on immigration has mainly come out of the Republican Party’s recent introspection, and the realization by its more thoughtful members, such as Sen. Marco Rubio of Florida and Gov. Bobby Jindal of Louisiana, that without such a shift the party may be facing demographic death in a country where the 2010 census showed, for the first time, that white births have fallen into the minority. It’s got nothing to do with Obama’s political capital or, indeed, Obama at all. The point is not that “political capital” is a meaningless term. Often it is a synonym for “mandate” or “momentum” in the aftermath of a decisive election—and just about every politician ever elected has tried to claim more of a mandate than he actually has. Certainly, Obama can say that because he was elected and Romney wasn’t, he has a better claim on the country’s mood and direction. Many pundits still defend political capital as a useful metaphor at least. “It’s an unquantifiable but meaningful concept,” says Norman Ornstein of the American Enterprise Institute. “You can’t really look at a president and say he’s got 37 ounces of political capital. But the fact is, it’s a concept that matters, if you have popularity and some momentum on your side.” The real problem is that the idea of political capital—or mandates, or momentum—is so poorly defined that presidents and pundits often get it wrong. “Presidents usually over-estimate it,” says George Edwards, a presidential scholar at Texas A&M University. “The best kind of political capital—some sense of an electoral mandate to do something—is very rare. It almost never happens. In 1964, maybe. And to some degree in 1980.” For that reason, political capital is a concept that misleads far more than it enlightens. It is distortionary. It conveys the idea that we know more than we really do about the ever-elusive concept of political power, and it discounts the way unforeseen events can suddenly change everything. Instead, it suggests, erroneously, that a political figure has a concrete amount of political capital to invest, just as someone might have real investment capital—that a particular leader can bank his gains, and the size of his account determines what he can do at any given moment in history. Naturally, any president has practical and electoral limits. Does he have a majority in both chambers of Congress and a cohesive coalition behind him? Obama has neither at present. And unless a surge in the economy—at the moment, still stuck—or some other great victory gives him more momentum, it is inevitable that the closer Obama gets to the 2014 election, the less he will be able to get done. Going into the midterms, Republicans will increasingly avoid any concessions that make him (and the Democrats) stronger. But the abrupt emergence of the immigration and gun-control issues illustrates how suddenly shifts in mood can occur and how political interests can align in new ways just as suddenly. Indeed, the pseudo-concept of political capital masks a larger truth about Washington that is kindergarten simple: You just don’t know what you can do until you try. Or as Ornstein himself once wrote years ago, “Winning wins.” In theory, and in practice, depending on Obama’s handling of any particular issue, even in a polarized time, he could still deliver on a lot of his second-term goals, depending on his skill and the breaks. Unforeseen catalysts can appear, like Newtown. Epiphanies can dawn, such as when many Republican Party leaders suddenly woke up in panic to the huge disparity in the Hispanic vote. Some political scientists who study the elusive calculus of how to pass legislation and run successful presidencies say that political capital is, at best, an empty concept, and that almost nothing in the academic literature successfully quantifies or even defines it. “It can refer to a very abstract thing, like a president’s popularity, but there’s no mechanism there. That makes it kind of useless,” says Richard Bensel, a government professor at Cornell University. Even Ornstein concedes that the calculus is far more complex than the term suggests. Winning on one issue often changes the calculation for the next issue; there is never any known amount of capital. “The idea here is, if an issue comes up where the conventional wisdom is that president is not going to get what he wants, and he gets it, then each time that happens, it changes the calculus of the other actors” Ornstein says. “If they think he’s going to win, they may change positions to get on the winning side. It’s a bandwagon effect.”

## 1AR

### solvency

#### Investors want exposure to nuclear – assumes natural gas.

SmartMoney, 3-16-2012, “Should Investors Go Nuclear?,” <http://blogs.smartmoney.com/advice/2012/03/16/should-investors-go-nuclear/>

The combination of low natural gas prices and the fallout from recent accidents turned many utilities off from building new nuclear power plants. But analysts say investors may still want more exposure to nuclear energy. Despite the lack of new nuclear facilities, existing plants continue to produce cheap, clean power. Right now, low natural gas prices are diminishing profit margins for many utilities, says Travis Miller, the director of utilities research at Morningstar. But nuclear power is still far cheaper to produce — and gas prices are only likely to go up, he says. “We think gas prices have to rise from here to rationalize the market.” And as soon as those prices rise, nuclear power producers can boost prices, and profit margins. The utility best-positioned to benefit from that trend would be Exelon (EXC ), the largest operator of nuclear power plants in the U.S., Miller says. “As the cost for other sources of power, specifically coal and natural gas, rise, Exelon’s earnings should rise,” he says. Plus, Exelon’s nuclear plants aren’t affected by new environmental regulations that may force some coal plants to close, he says. Morningstar analysts also see NRG Energy (NRG ) as a good value now. Two-thirds of this company’s power generation comes from coal and nuclear plants. Its coal plants are already more efficient than competitors’, Miller says. “We think its entire fleet, including nuclear and its very low-cost and efficient coal and gas plants, all can benefit in an environment where power demand and gas prices rise,” he says.

### states

#### Skilled worker shortage wrecks solvency.

Harold Bengelsdorf, 2007, consultant and former director of energy department offices, “THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY,” <http://www.nuclearcompetitiveness.org/images/COUNCIL_WHITE_PAPER_Final.pdf>

Thus the challenge the U.S. nuclear industry faces today is whether the U.S. civil nuclear infrastructure will be strong enough to support a hoped for nuclear revival in this country, which could entail the construction and commissioning of up to eight nuclear power units during the 2010 to 2017 period. Several studies have been devoted to this question, and the answer is by no means certain. The shortage in skilled labor is expected to double in this country by the year 2020 and the workforce will stop growing as the baby boomers start to retire.

#### PRISM requires federal investment to cover capital risk – recycling fuels.

Per Peterson, 11-29-2010, Professor and Chair Department of Nuclear Engineering UC Berkeley, Ph.D. Mechanical Engineering, University of California, Berkeley, Presidential Young Investigator Fellow, American Nuclear Society, member of a National Research Council committee reviewing DOE Office of Nuclear Energy R&D programs, BraveNewClimate, “The IFR vs the LFTR: An Exchange of Email,” <http://bravenewclimate.com/2011/11/17/ifr-lftr-exchange/>

IFR metal fuels are vastly better than conventional oxide fuels from the perspective of affordable and secure fuel recycle. LFTR is also a potentially attractive technology, but clearly has substantial technology risk. So yes, I strongly support demonstration of IFR technology. The key issue is that IFR needs to remain a part of a portfolio of technologies the federal government invests in, and that IFR demonstration needs to sustain discipline to assure that federal investment is likely to result in commercial success. A simple type of evidence, which Congress has required for the next-generation nuclear plant (NGNP) project, would be 50% cost sharing by commercial interests. I think that this approach is too simplistic, since it does not recognize how risk changes during design, licensing, and construction of a demonstration reactor. The best approach is to require very small or zero commercial investment at the stage of conceptual design and NRC pre-application review, moderate commercial investment during detailed engineering and NRC licensing, and substantive commercial investment for the construction of a prototype unit (where the intellectual property and up-side commercial potential ends up being owned by the commercial entities who invest). This sort of decision framework is also easier to implement in statute, since one can authorize the needed expenditures, but the actual appropriations can depend upon progress being made and commercial investment materializing. What commercial interests will tell you is that it is much easier to make a decision to make a substantial investment if they have an NRC construction license to build a reactor, while it is almost impossible if the reactor is just a concept that needs a lot of detailed engineering work. But in the end, the commercial entities that perform this reactor development work are also in the best position to assess its commercial potential–so a lack of willingness to place some commercial money at risk (less earlier and more later) should be viewed as evidence that the concept needs more R&D, not accelerated demonstration. For IFR, though, the availability of affordable fuel is a big issue. It requires the capacity to recycle used LWR and IFR fuel, as well as to test and qualify recycled fuels for use in IFRs. This is a problem that the commercial sector is not going to be willing to take on, and thus it requires purely federal effort.

#### A federal commitment key – legal process.

DOE (Department of Energy), 1-10-2005, “MOVING FORWARD WITH NUCLEAR POWER: ISSUES AND KEY FACTORS,”

Final Report of the Secretary of Energy Advisory Board, Nuclear Energy Task Force, <http://www.seab.energy.gov/publications/NETF_Final_Draft_0105.pdf>

It is highly unlikely that there will be new nuclear plants constructed in the United States unless there is effective leadership in dealing with our national energy needs over the next few years. Although there is strong justification for moving forward with nuclear power, and although a streamlined regulatory and legal framework for such construction is largely in place, nothing constructive will happen without strong leadership in a number of areas. The information provided to the NETF has confirmed that there is an interest in the private sector in new plant construction, although some additional government actions must take place before the first plants will be constructed. In this connection, the electricity industry must clarify its needs and prioritize its requests. In particular, the nuclear industry must also convey information to Federal policy makers in clear, sharply defined terms with specific recommendations for dealing with both the problems and the opportunities presented. The industry must recognize that the Federal government should not and cannot eliminate all the risks and vagaries of the energy markets for them. The utilities must develop a reasonable consensus position and present those needs clearly to the Administration and Congress for action. In this connection, we believe the most critical needs include some assistance to offset the higher capital costs associated with the first few nuclear plants, and establishment of regulatory and economic conditions that will make the first few projects viable and attractive to potential investors in both the equity and the debt markets, along with conditions that allow participants in those markets to finance the plants. These issues are discussed in detail in Chapter 3 and Appendix A. The providers of electrical energy to the nation’s homes and industry (i.e., the generating companies) are providing some of the critical initiative for moving forward. But their vision and commitment must be conveyed beyond corporate boardroom and trade association meetings and must also impact the public arena. The nuclear industry must undertake a vigorous and continuing communications program to make the case to the American public that nuclear power is a safe, reliable, and cost-effective part of our energy network and must continue to be a significant part of the growth of our energy supply. Of course, any such program must be based on a continued commitment to safe, reliable, and secure operations. The principal contribution that government can make to the process is to provide, maintain, and support a regulatory and legal environment that eliminates needless uncertainty and delay from initiation of construction through plant startup. Much has already been accomplished in this direction over recent years, but it is becoming apparent that some additional action is required. Leadership from the Administration and Congress is necessary to encourage investment in new construction. Although there is bipartisan support for nuclear power within the membership of both the House and Senate, there is some conflict within the leadership ranks. Consideration of energy supply issues should serve as a stimulus to resolve these differences. In this time of concern about energy security, it is imperative that the President, the key members of the Administration, and Congressional leaders, come together to create an effective national program and a plan for its legislative implementation. We urge that the President identify this as a critical priority for the nation and that the Congress take the necessary steps to meet this priority. The following key areas must be addressed by the policy leaders. • A clear commitment to a national energy policy that includes recognition that nuclear power provides a reliable, stable contribution to energy availability and energy security without adverse environmental consequences. • Resolution of current issues associated with the disposition of spent fuel. • A reasonable level of Federal involvement to enable private-sector engagement in new construction. As discussed above, this would involve Federal policies to reduce fears that there might be devastating delays imposed by the legal process in the completion or startup of new plants, to address the higher costs of first units that are constructed, and to level the playing field for nuclear power with respect to other non-carbon-dioxide-emitting sources.

### politics

#### CiR would turn the social security argument

Jack Martin, April 2009 Special Projects Director at the Federation for American Immigration Reform Amnesty & the Economy: Myths, Lies & Obfuscation http://www.fairus.org/site/DocServer/amnesty\_economy.pdf

Illegal Aliens Subsidize the Social Security System? Amnesty advocates also argue that illegal aliens who obtain jobs using counterfeit or stolen identity documents contribute Social Security earnings that are withheld but are unable to claim retirement benefits. While this is correct, analysis of this fact demonstrates that the effects of an amnesty would not be a benefit, but rather a fiscal cost. If the illegal workers received amnesty, they then would obtain legal Social Security numbers and become able to request that any contributions made when they were working illegally be transferred out of the SSA “earnings suspense file” and credited to their new legal Social Security account. Those funds from their illegal work would be then counted towards retirement benefits. The net result would be further erosion of the viability of the current Social SecurityTrust Fund. The erosion would come both because those set aside funds would no longer be set aside, and because the social security system is redistributive. Low-wage workers receive much higher payments compared to their contributions than high-wage workers, and amnesty beneficiaries will largely be low-wage workers. That means that instead of the results being a zerosum, the newly legalized aliens would receive disproportionate benefits compared to their contributions. For example, the beneficiaries of the 1986 IRCA amnesty had a median income of $15,364.8 Thus, half of all amnesty recipients had income lower than that low level of earnings. As the poverty level for a family of four was $11,000 at that time, many among the amnesty recipients became eligible for welfare benefits as a result of having poverty or near-poverty earnings. More recently, the Pew Hispanic Center reported that, “Poverty rates are much higher among unauthorized immigrants than for either U.S.-born or legal immigrant residents. Among adults who are unauthorized immigrants, one-in-five (21%) is poor.”9

#### CIR destroys the H-1B visa program.

Nierman, 2010 [Matt Nierman, Immigration Lawyer @ Shihab & Associates, 4-29-2010, A Wolf in Sheep's Clothing?, Immigration Visa Lawyer Blog, p. www.immigration-visa-lawyer-blog.com/2010/04/a-wolf-in-sheeps-clothing-colu.html]

U.S. Senators from the Democratic Party have recently released the first serious outline for eventual Comprehensive Immigration Reform legislation. This plan not only re-writes the rules regarding the attainment of citizenship with regard to those aliens who have entered without inspection, but it also alters the legal landscape for gaining an employment based green card through the PERM process as well as H-1B and L-1 temporary visas. While some of the changes that have been outlined largely appear to bring long needed adjustments to the employment based visa system, there is cause for concern regarding certain aspects of the plan relative to employment based immigration. The American public, petitioning employers as well as highly skilled persons from around the world are left to wonder, does this comprehensive immigration reform plan really do more to attract the world's best and brightest, or does this plan discourage highly skilled people from working in the United States. Is this plan for Comprehensive Immigration reform a wolf in sheep's clothing? The Effect on Educated Foreign Workers The central theme of the proposed immigration plan, relative to employment based immigration, is to encourage highly skilled laborers to immigrate permanently, while at the same time discouraging temporary visas for highly skilled persons. This goal is accomplished by simply systematically removing restrictions for obtaining a Green Card for certain highly skilled foreign nationals, while a bevy of crushing restrictions will be imposed on employers hiring temporary workers under the H-1B and L-1 categories. (See page 18. Section A.) Whether it is the unintended or simply unspoken net effect of the proposed policy changes, the number of highly skilled persons approved for employment based immigration will be reduced under this proposed plan in the form that it is written. First the Good News This proposed plan for immigration recognizes that the current system of assigning Green Cards for highly skilled workers on a country by country basis has few if any positive policy aspects. Under the new plan, per-country employment based immigration caps will be abolished. In contrast, the current system nonsensically imposes a five year waiting period for obtaining a Green Card on people from India or China who possess a master's degree. Additionally, Employment Based Green Cards for persons from Mexico holding a bachelors degree are currently unavailable at all, while persons with bachelor's degree from any other country in the world could theoretically obtain a Green Card, eventually. Removing the per-country preference for employment based immigration for highly skilled individuals is a welcome and needed change to the current immigration scheme. Additionally, the proposed plan simplifies the employment process for aliens who hold advanced degrees from American universities and enter the United States with a valid offer of employment from an American employer. This change is intended to remedy the incongruence between America's open pursuit of foreign nationals to study in American Universities, but refusal to allow the same talented people to remain to work and live. This plan also removes the "non-immigrant intent" requirement to many of the visas that are given to foreign national students. Under the current plan, most student visas require that the student have no immigrant intent when studying in the United States. This requirement is fulfilled by not allowing such students to immediately apply for immigrant visas in most situations. Some visas even require students to return to their country of origin for a period of time before returning to the United States after they have graduated. Part of the legislative goal of the old policy was to promote American ideas by forcing students to return home and use the knowledge, skills and American experience in their native countries, thereby expanding the American cultural influence to the world. At this point in time, most countries have been exposed to American ideas and ideals and have accepted or rejected the same. Therefore, it is high time that America not snub the very people that America educates here by requiring them to move back home or wait for some ridiculous period before receiving a Green Card. The proposed plan would do much to remedy this outdated policy objective. ... and then the Bad News The H-1B and L-1 system of temporary visas for skilled workers has come under increased scrutiny for years. Many administrative policy changes have been levied upon these visas categories in order to prevent perceived fraud, abuse and injury to Americans seeking jobs. The proposed plan would now set in stone tougher requirements for obtaining and maintaining such visas through legislation as well as imposing increased penalties on those businesses and employees attempting to obtain an H-1B or L-1 visa without adhering to the law. The proposed changes to the H-1B visa classification would greatly obviate the incentive for businesses to rely on H-1B workers. First, the plan proposes to revise wage determination requirements without further elaboration. While not specific, the past practice for revising prevailing wage determinations has been to either (1) increase the wage required, or (2) increase the time to process a request to the government to decide a prevailing wage for a potential H-1B position to a snail's pace. Both changes are detrimental to H-1B employers. Artificially raising the prevailing wage for a position means that it will cost an employer much more to hire an Alien than what an American worker would accept for the job. Secondly, because time equals money, increasing the time to determine a prevailing wage from minutes to months will undoubtedly have a drastic effect on a company's decision to hire an H-1B worker. The proposed plan also requires internet posting of the H-1B position. One is left to wonder what type of posting this would be. Would the posting be to a government or private database where the immigration authorities or the general public could view such postings for H-1B workers by companies? Would the internet posting be a recruitment type of mechanism such as internet posting under the PERM recruitment of employment based Green Cards? What is known is that any type of posting will be more costly in time and expense than postings under the current system. The proposed plan would also lengthen US worker displacement protection and apply certain requirements that are now only binding on H-1B dependant employers to all H-1B employers. Among such possible changes are prohibitions on hiring H-1B workers for 90 days before or after a layoff, requirements to offer the job to American workers before foreign nationals and heightened employer attestations, punishable by penalties, regarding not displacing American workers. None of these options are appetizing for human resource professionals, business owners or managers. The plan would also limit the number of H-1B workers that an H-1B employer could hire. Such a numerical limitation would be a drastic departure from the current H-1B format that requires no numerical limitation at all and severely alter the manner that many American companies conduct business. The plan also outlines specific requirements and penalties for employers of L-1 visas. First, absent a waiver, L-1 beneficiaries holding specialized knowledge will only be permitted to serve for one year if they are stationed at a worksite other than their employer's. Additionally, L-1 worksite requirements, working conditions and rates will be altered. Finally, penalties and enforcement for non-compliance will be increased. As for enforcement in general, the Department of Labor would be given increased authority, even requiring mandatory annual visitations for companies hiring large numbers of H-1B or L-1 workers. Finally, and predictably, penalties for non compliance will be increased. Conclusion While this proposed plan for immigration reform purports to increase opportunities for highly skilled aliens in America, the plan actually disguises a scheme for shredding the H-1B and L-1 visa programs. Good immigration policy requires incentives to attract the world's best minds to our shores. The current system of encouraging temporary than permanent employment of highly skilled persons, though imperfect, accomplishes this goal. This innocent looking proposed plan actually proceeds to attack the H-1B and L-1 programs in a fashion never seen since their creation. These programs are the primary way for foreign nationals to introduce themselves to U.S. employers and by making such drastic changes, U.S. employers will be cut off from the introduction to highly skilled aliens that the H-1B and L-1 visa categories provide. This plan merely disguises the intent to slash employment of highly skilled foreigners through the disguise of easier to obtain permanent employment. Hopefully the legislative process will remedy the inconsistencies of policy rampant in the plan as currently provided.

#### Won’t pass – ranking republicans and democrats are gridlocked.

Richard Cowan, 2-5-2013, Reuters, “House Republicans challenge Obama immigration plan's citizenship goal,” <http://www.reuters.com/article/2013/02/05/us-usa-immigration-idUSBRE9130V620130205>

Republicans in the U.S. House of Representatives on Tuesday challenged President Barack Obama's central goal for immigration reform that would put 11 million undocumented residents on a path to citizenship, adding fresh doubts on whether legislation can be passed this year. During a kick-off hearing, House Judiciary Committee Chairman Bob Goodlatte explored a possible "middle ground" between the current U.S. policy of deporting those who have come to the United States illegally and of placing them on a path to citizenship, as Obama has demanded. The hearing was the panel's first since last November's elections when Hispanic-Americans voted in droves for Obama and his fellow Democrats in Congress. Those election results caused Republicans to rethink their anti-immigration stances, which were highlighted by presidential candidate Mitt Romney's urging that illegal residents should simply "self-deport." A standoff over Democrats' goal of providing citizenship hopes for the immigrants living illegally in the United States could torpedo reform efforts in this Congress. Still, many Republicans expressed concerns about rewarding illegal immigrants with eventual citizenship, which they often decry as an "amnesty." House Majority Leader Eric Cantor, in a speech to the conservative American Enterprise Institute, noted, "While we are a nation that allows anyone to start anew, we are also a nation of laws." Cantor of Virginia is the second-ranking House Republican and has a say in which bills are debated before the full House. At the House Judiciary hearing, Goodlatte, another Virginia Republican, asked, "Are there options to consider between the extremes of mass deportation and pathway to citizenship?" Julian Castro, the Democratic mayor of San Antonio, Texas, who testified before Goodlatte's panel, responded: "I believe, as the president has pointed out ... that a path to citizenship is the best option" for the 11 million, many of whom have lived in the United States for a decade or more. Some Republicans have sketched out more modest steps in dealing with illegal immigrants who live under the threat of deportation. Instead of putting them in line for citizenship, they have suggested a permanent work visa system. But last week, Senator Dick Durbin of Illinois, the second-ranking Senate Democrat, told Reuters legislation could not be enacted unless it contains a path to full citizenship. During Tuesday's House committee hearing, Democratic Representative Zoe Lofgren of California warned: "Partial legalization, as some are suggesting, is a dangerous path and we need only look at France and Germany to see how unwise it is to create a permanent underclass" in the United States.

#### Obama is trying to collapse immigration reform and blame the Republicans.

Chris Stirewalt, 1-29-2013, is digital politics editor for Fox News, and his POWER PLAY column, Fox News, “Obama Prepares Poison Pills on Immigration,” <http://www.foxnews.com/politics/2013/01/29/obama-prepares-poison-pills-on-immigration/>

Obama will make his speech the day after a bipartisan group of senators laid out their proposal for what an agreement would look like, a mix of enforcement measures and a “path to citizenship.” (This phrase always strikes Power Play as odd since even immigration hardliners offer a path to citizenship, it’s just that for them the path starts in Tegucigalpa or Niamey after deportation.) Conservatives are very angry over the a-word: amnesty. Conservative defenders of the idea are quick to denounce the use of the word, but the truth is that any plan that does not involve mass deportations or, famously, “self-deportations” is some kind of amnesty. Condition, partial, etc., but amnesty still. But unless Romneyite Republicans have a plan on this subject that is politically viable, the net effect of blocking some compromise now would be four more years of, as Sen. Marco Rubio has called it, “de facto amnesty.” Opponents may say that it’s worth waiting for a more Republican Washington to act and try to get a better bill, but the irony is that if conservatives block a compromise now, Obama will use that resistance to make it more difficult for Republicans to make midterm gains and harden Hispanic sentiment against the GOP. The final bill may not be palatable to the right and may not pass, but the consequences of not being at the table for this one would be dire for conservatives, in policy and in politics. House Republicans tell Power Play that they are working up a plan of their own that they will add to the mix in coming weeks and congressional aides confirm that what’s being proposed will not include mass deportations, self-selected or otherwise. Whatever is said by opponents of a deal, there is no political stomach in the rank-and-file GOP for a plan that involves rounding up Hispanic illegal immigrants en masse. So indeed everyone is talking about an amnesty of some kind, the question being what conservatives are willing to trade in order to get behind the plan. How long is the path to citizenship? Will those not on that fabled path be subject to deportation? How can border security be measured? How much in back taxes will path-bound illegals be forced to pay? How will the use of English be mandated and verified, etc. This is all a very tricky business for Republicans who are desperate to stop talking about the subject. The realization after Obama’s first term is that many Democrats would rather talk about illegal immigration than actually fix the problem since it affords them a base-rallying subject and a way to attack the GOP as a bunch of racist xenophobes. But it’s decidedly un-conservative to let people off the hook for breaking the law or to reward bad behavior. Plus, the costs associated with this legislation are considerable (of course the costs of having some 10 million illegals here is nothing to sneeze at).So Republicans are anguishing themselves trying to figure out how much they want in return for the conditional amnesty, the president is jumping ahead to what he wants next. Republicans see amnesty as their concession. Obama sees it as the assumption and is ready to make new demands. According to Buzzfeed, we can expect to hear the president today explain that any law should include provisions for same-sex couples in which one partner is in the country illegally. Now, according to Obama’s unified theory of conservatism in which Republicans in Congress actually agree with him on many issues but unpatriotically oppose him out of fear of punishment by conservative pundits and a certain cable news network, would having a big event in Las Vegas and talking about gay marriage make it more or less likely that legislation would pass? Obama is expected to make other demands more in keeping with a negotiation, essentially haggling over how much or how little Democrats should give up in exchange for conditional amnesty. But gay marriage is like a double poison pill here. And we can also expect to hear for the president to call for additional spending on education, etc. as part of his proposal because, well, that’s kind of his jam. In the White House version of events, Obama has already won on the issue of amnesty, just as Team Obama argues he had already won on the issue of higher taxes on top earners, the debt ceiling, gun control and so much else. This fungible, ever-expanding mandate means for the Obama Democrats that amnesty is assumed, now the question is what else. The president is then taking a kind of pre-emptive victory lap on immigration today, claiming credit for advancing the national discussion by securing the border and winning re-election in a campaign that explicitly called for amnesty. The message: I’m glad you bitter clingers are starting to see things my way, now let’s talk about what else you should be doing. This is, of course, not the way to get a deal done. The way to do the deal, according to the president’s own unified theory of conservative behavior, would be for him to be quiet. Any plan that he likes, by his reasoning, would be automatically disliked by his unpatriotic opponents so a hearty endorsement would be bad news. The same would go for taking credit for advancing the discussion on immigration beyond nativism. And so would making demands about sensitive social issues unrelated to the larger topic. One starts to get the idea here that Obama isn’t trying to get a deal at all. Just as in the “fiscal cliff” and the rest of his second-term agenda, the goal seems to enrage the right, divide the GOP and set the table for a Democratic victory in 2014.I f Obama succeeds, he will not only retain the issue of immigration to use as a cudgel against Republicans, who will be accused of xenophobia and intransigence… again, but he will also be one step closer to finally breaking the majority in the House.

#### Winners-win - Hirsch cont’d

In theory, and in practice, depending on Obama’s handling of any particular issue, even in a polarized time, he could still deliver on a lot of his second-term goals, depending on his skill and the breaks. Unforeseen catalysts can appear, like Newtown. Epiphanies can dawn, such as when many Republican Party leaders suddenly woke up in panic to the huge disparity in the Hispanic vote. Some political scientists who study the elusive calculus of how to pass legislation and run successful presidencies say that political capital is, at best, an empty concept, and that almost nothing in the academic literature successfully quantifies or even defines it. “It can refer to a very abstract thing, like a president’s popularity, but there’s no mechanism there. That makes it kind of useless,” says Richard Bensel, a government professor at Cornell University. Even Ornstein concedes that the calculus is far more complex than the term suggests. Winning on one issue often changes the calculation for the next issue; there is never any known amount of capital. “The idea here is, if an issue comes up where the conventional wisdom is that president is not going to get what he wants, and he gets it, then each time that happens, it changes the calculus of the other actors” Ornstein says. “If they think he’s going to win, they may change positions to get on the winning side. It’s a bandwagon effect.”

#### Political capital theory is not true – historical examples.

Michael Hirsh, 2-7-2013, is chief correspondent for National Journal, he also contributes to 2012 Decoded, previously served as the senior editor and national economics correspondent for Newsweek, based in its Washington bureau, was also Newsweek’s Washington web editor and authored a weekly column for Newsweek.com, NationalJournal, “There’s No Such Thing as Political Capital,” <http://www.nationaljournal.com/magazine/there-s-no-such-thing-as-political-capital-20130207>

\*\*\*cites George Edwards, a presidential scholar at Texas A&M University, Richard Bensel, a government professor at Cornell University, and Norman Ornstein of the American Enterprise Institute\*\*\*

Presidents are limited in what they can do by time and attention span, of course, just as much as they are by electoral balances in the House and Senate. But this, too, has nothing to do with political capital. Another well-worn meme of recent years was that Obama used up too much political capital passing the health care law in his first term. But the real problem was that the plan was unpopular, the economy was bad, and the president didn’t realize that the national mood (yes, again, the national mood) was at a tipping point against big-government intervention, with the tea-party revolt about to burst on the scene. For Americans in 2009 and 2010—haunted by too many rounds of layoffs, appalled by the Wall Street bailout, aghast at the amount of federal spending that never seemed to find its way into their pockets—government-imposed health care coverage was simply an intervention too far. So was the idea of another economic stimulus. Cue the tea party and what ensued: two titanic fights over the debt ceiling. Obama, like Bush, had settled on pushing an issue that was out of sync with the country’s mood. Unlike Bush, Obama did ultimately get his idea passed. But the bigger political problem with health care reform was that it distracted the government’s attention from other issues that people cared about more urgently, such as the need to jump-start the economy and financial reform. Various congressional staffers told me at the time that their bosses didn’t really have the time to understand how the Wall Street lobby was riddling the Dodd-Frank financial-reform legislation with loopholes. Health care was sucking all the oxygen out of the room, the aides said. Weighing the imponderables of momentum, the often-mystical calculations about when the historic moment is ripe for an issue, will never be a science. It is mainly intuition, and its best practitioners have a long history in American politics. This is a tale told well in Steven Spielberg’s hit movie Lincoln. Daniel Day-Lewis’s Abraham Lincoln attempts a lot of behind-the-scenes vote-buying to win passage of the 13th Amendment, banning slavery, along with eloquent attempts to move people’s hearts and minds. He appears to be using the political capital of his reelection and the turning of the tide in the Civil War. But it’s clear that a surge of conscience, a sense of the changing times, has as much to do with the final vote as all the backroom horse-trading. “The reason I think the idea of political capital is kind of distorting is that it implies you have chits you can give out to people. It really oversimplifies why you elect politicians, or why they can do what Lincoln did,” says Tommy Bruce, a former political consultant in Washington. Consider, as another example, the storied political career of President Franklin Roosevelt. Because the mood was ripe for dramatic change in the depths of the Great Depression, FDR was able to push an astonishing array of New Deal programs through a largely compliant Congress, assuming what some described as near-dictatorial powers. But in his second term, full of confidence because of a landslide victory in 1936 that brought in unprecedented Democratic majorities in the House and Senate, Roosevelt overreached with his infamous Court-packing proposal. All of a sudden, the political capital that experts thought was limitless disappeared. FDR’s plan to expand the Supreme Court by putting in his judicial allies abruptly created an unanticipated wall of opposition from newly reunited Republicans and conservative Southern Democrats. FDR thus inadvertently handed back to Congress, especially to the Senate, the power and influence he had seized in his first term. Sure, Roosevelt had loads of popularity and momentum in 1937. He seemed to have a bank vault full of political capital. But, once again, a president simply chose to take on the wrong issue at the wrong time; this time, instead of most of the political interests in the country aligning his way, they opposed him. Roosevelt didn’t fully recover until World War II, despite two more election victories. In terms of Obama’s second-term agenda, what all these shifting tides of momentum and political calculation mean is this: Anything goes. Obama has no more elections to win, and he needs to worry only about the support he will have in the House and Senate after 2014. But if he picks issues that the country’s mood will support—such as, perhaps, immigration reform and gun control—there is no reason to think he can’t win far more victories than any of the careful calculators of political capital now believe is possible, including battles over tax reform and deficit reduction. Amid today’s atmosphere of Republican self-doubt, a new, more mature Obama seems to be emerging, one who has his agenda clearly in mind and will ride the mood of the country more adroitly. If he can get some early wins—as he already has, apparently, on the fiscal cliff and the upper-income tax increase—that will create momentum, and one win may well lead to others. “Winning wins.” Obama himself learned some hard lessons over the past four years about the falsity of the political-capital concept. Despite his decisive victory over John McCain in 2008, he fumbled the selling of his $787 billion stimulus plan by portraying himself naively as a “post-partisan” president who somehow had been given the electoral mandate to be all things to all people. So Obama tried to sell his stimulus as a long-term restructuring plan that would “lay the groundwork for long-term economic growth.” The president thus fed GOP suspicions that he was just another big-government liberal. Had he understood better that the country was digging in against yet more government intervention and had sold the stimulus as what it mainly was—a giant shot of adrenalin to an economy with a stopped heart, a pure emergency measure—he might well have escaped the worst of the backlash. But by laying on ambitious programs, and following up quickly with his health care plan, he only sealed his reputation on the right as a closet socialist. After that, Obama’s public posturing provoked automatic opposition from the GOP, no matter what he said. If the president put his personal imprimatur on any plan—from deficit reduction, to health care, to immigration reform—Republicans were virtually guaranteed to come out against it. But this year, when he sought to exploit the chastened GOP’s newfound willingness to compromise on immigration, his approach was different. He seemed to understand that the Republicans needed to reclaim immigration reform as their own issue, and he was willing to let them have some credit. When he mounted his bully pulpit in Nevada, he delivered another new message as well: You Republicans don’t have to listen to what I say anymore. And don’t worry about who’s got the political capital. Just take a hard look at where I’m saying this: in a state you were supposed to have won but lost because of the rising Hispanic vote. Obama was cleverly pointing the GOP toward conclusions that he knows it is already reaching on its own: If you, the Republicans, want to have any kind of a future in a vastly changed electoral map, you have no choice but to move. It’s your choice. The future is wide open.

# Northwestern round 3

## 2AC

### 2AC topicality – ‘For’

#### We meet - loan guarantees are financial incentives for energy.

Kernaghan Webb, 1993, lecturer in the Faculty of Law at the University of Ottawa, “Thumbs, Fingers, and Pushing on String: Legal Accountability in the Use of Federal Financial Incentives,” Lexis Nexis

In this paper, "financial incentives" are taken to mean disbursements 18 of public funds or contingent commitments to individuals and organizations, intended to encourage, support or induce certain behaviors in accordance with express public policy objectives. They take the form of grants, contributions, repayable contributions, loans, loan guarantees and insurance, subsidies, procurement contracts and tax expenditures.19 Needless to say, the ability of government to achieve desired behavior may vary with the type of incentive in use: up-front disbursements of funds (such as with contributions and procurement contracts) may put government in a better position to dictate the terms upon which assistance is provided than contingent disbursements such as loan guarantees and insurance. In some cases, the incentive aspects of the funding come from the conditions attached to use of the monies.20 In others, the mere existence of a program providing financial assistance for a particular activity (eg. low interest loans for a nuclear power plant, or a pulp mill) may be taken as government approval of that activity, and in that sense, an incentive to encourage that type of activity has been created.21 Given the wide variety of incentive types, it will not be possible in a paper of this length to provide anything more than a cursory discussion of some of the main incentives used.22

#### We meet – was created to address energy demands.

Steve Kirsch, 2009, M.S. Massachusetts Institute of Technology (MIT), writer for the Huffington Post, CEO Kirsch foundation on climate, founder/head of Center for Energy and Climate Change, National Award from the Caring Institute in Washington DC, written much about the Integral Fast Reactor, Fellow, with the Science Council for Global Initiatives (SCGI), Steve Kirsch’s blog, “The Integral Fast Reactor (IFR) project: Congress Q&A,” <http://skirsch.com/politics/ifr/QAcongressKirsch.htm>

\*\*\*cites Charles Till, former Associate Director, Argonne National Laboratory, The National Academy Studies, James Hansen, Director, NASA Goddard Institute for Space Studies, Ray Hunter, former Deputy Director of the Office of Nuclear Energy, Science and Technology in the U.S. Department of Energy (DOE), Leonard Koch, winner of the Global Energy International Prize, Barry Brook Sir Hubert Wilkins Chair of Climate Change\*\*\*

There is no other alternative energy technology which eats our nuclear waste for fuel. So a billion dollars to solve a $100 billion dollar nuclear waste problem is a good deal. You get the power for free. Secondly, we need a technology to offer to India and China that is more attractive than coal. None of the alternatives you are funding now do that. But if we don't do it, the planet will suffer damages beyond repair. We must get rid of coal or we are hosed. Nothing we can do will matter. This project will take 5 years if Obama orders the NRC to fast-track the certification of the PRISM and the longer we keep putting it off, the more damage will be done. It gets exponentially harder to stop global warming as time goes on. The least expensive approach is to start yesterday. While a billion dollars is a large earmark, it is tiny in comparison to the magnitude of the problem it solves. Thirdly, because our government already invested 10 years and $1 billion into it already and then pulled the rug out from under it even though it met all expectations. Fourth, because this technology was invented by our nation's top energy scientists at our top energy national lab to solve our energy problems. How can you not fund your own top scientists especially when they proved they were right and that we now need it more than ever?

#### C/I - Used in the topic, ‘for’ is a prepositional verb meaning to wish something to be obtained.

Merriam Webster’s, 2012, <http://dictionary.reference.com/browse/for>

For; prepositional verb - used to express a wish, as of something to be experienced or obtained.

#### More ev. - decreases energy costs.

Steve Kirsch, 11-25-2009, M.S. Massachusetts Institute of Technology (MIT), writer for the Huffington Post, CEO Kirsch foundation on climate, founder/head of Center for Energy and Climate Change, National Award from the Caring Institute in Washington DC, written much about the Integral Fast Reactor, Fellow, with the Science Council for Global Initiatives (SCGI), Steve Kirsch’s blog, “Why We Should Build an Integral Fast Reactor Now,” <http://skirsch.wordpress.com/2009/11/25/ifr/>

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A successful IFR demonstration has the following important benefits: The only technology we have with a realistic potential to save the planet. Eliminating carbon emissions from coal plants worldwide is required to prevent a climate catastrophe. But using carbon capture adds cost and may not be practical or viable. The IFR, on the other hand, can replace the burner in an existing coal plant while reducing operating costs. So countries will actually want to eliminate their carbon emissions because they’ll save money. This is why the IFR is one of Jim Hansen’s top five priorities for saving the planet: because the IFR is the only viable solution we know of today can eliminate CO2 emissions from coal plants without increasing energy costs. Addresses the climate change problem while helping our ecomomy with lower energy costs and increased jobs. Unlike many renewable sources, nuclear power has the potential to decrease energy costs and create new high paying jobs.

### solvency

#### PRISM could be developed in five years – other reprocessing alternatives create worse waste problems.

Fred Pearce, 8-8-2012, is a freelance author and journalist based in the UK, he serves as environmental consultant for New Scientist magazine and is the author of numerous books, including When The Rivers Run Dry and With Speed and Violence, in previous articles for Yale Environment 360, environment 360, Breakthrough Institute, “Nuclear Fast Reactor: The Saviour of Nuclear Power?,” <http://oilprice.com/Alternative-Energy/Nuclear-Power/Nuclear-Fast-Reactor-The-Saviour-of-Nuclear-Power.html>

Apart from a fast-breeder reactor, the main alternative is to blend the plutonium with other fuel to create a mixed-oxide fuel (mox) that will burn in conventional nuclear power plants. Britain has a history of embarrassing failures with mox, including the closure last year of a $2 billion blending plant that spent 10 years producing a scant amount of fuel. And critics say that, even if it works properly, mox fuel is an expensive way of generating not much energy, while leaving most of the plutonium intact, albeit in a less dangerous form. Only fast reactors can consume the plutonium. Many think that will ultimately be the UK choice. If so, the PRISM plant would take five years to license, five years to build, and could destroy probably the world's most dangerous stockpile of plutonium by the end of the 2020s.

#### No risk of accidents – chemical benefits and engineering experience.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

One of the issues most often mentioned when discussing sodium-cooled fast reactors—by far the type with the most reactor-years of experience worldwide—is the chemical reactivity of sodium, which burns upon contact with air (though with a very cool flame) and reacts quite dramatically upon contact with water. Yet sodium has several compelling advantages in fast-reactor operation: superior heat-exchange properties, virtually no corrosive effect on reactor components even after decades of operation, short half-life of sodium isotopes that form in the reactor vessel, etc. (see previous section). Some advocates of other systems characterize sodium’s volatility as a deal-breaker. But the intermediate loop that transfers heat from the reactor vessel to the steam generator contains only non-radioactive sodium, with the steam generator isolated in a separate structure, assuring that in the highly unlikely event of a sodium-water reaction there will be no danger to the primary system and no chance of radioactive material being involved. This design means that the unfairly characterized sodium problem is nothing more than an engineering design issue, involving a common element that has been used in industrial processes for well over a century.

### prolif

#### Fast reactors are waste safe and not vulnerable to terrorists – too hot and not enough material.

Steve Kirsch, 11-25-2009, M.S. Massachusetts Institute of Technology (MIT), writer for the Huffington Post, CEO Kirsch foundation on climate, founder/head of Center for Energy and Climate Change, National Award from the Caring Institute in Washington DC, written much about the Integral Fast Reactor, Fellow, with the Science Council for Global Initiatives (SCGI), Steve Kirsch’s blog, “Why We Should Build an Integral Fast Reactor Now,” <http://skirsch.wordpress.com/2009/11/25/ifr/>

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A 1 GWe IFR plant generates 1 ton of fission products each year that needs to be sequestered for 300 years until it is safe. A conventional nuclear plant of the same capacity creates about 100 tons of “waste” each year, containing isotopes that need to be sequestered for 1 million years according to the current US depository requirements. If you powered your entire life from IFRs, the amount of waste you’d generate would be smaller than 1 soda can and it would need to be stored for only 300 years. Nuclear material security: The nuclear material in the reactor or reprocessing facility would be too hot for a terrorist to handle. The nuclear material that leaves the site are the fission products which are completely useless for making a nuclear bomb.

### 2AC IAEA prolif CP

####  ‘Should’ does not mean mandatory.

Atlas, 1999, Collaboration, “Use of shall, should, may can,” rd13doc.cern.ch/Atlas/DaqSoft/sde/inspect/shall.html

shall' describes something that is mandatory. If a requirement uses 'shall', then that requirement \_will\_ be satisfied without fail. Noncompliance is not allowed. Failure to comply with one single 'shall' is sufficient reason to reject the entire product. Indeed, it must be rejected under these circumstances. Examples: "Requirements shall make use of the word 'shall' only where compliance is mandatory." This is a good example. "C++ code shall have comments every 5th line." This is a bad example. Using 'shall' here is too strong. should 'should' is weaker. It describes something that might not be satisfied in the final product, but that is desirable enough that any noncompliance shall be explicitly justified. Any use of 'should' should be examined carefully, as it probably means that something is not being stated clearly. If a 'should' can be replaced by a 'shall', or can be discarded entirely, so much the better.

#### Certainty key to investment – will otherwise say no to construction.

Sony Ben-Moshe et. al, 2009, , Jason J. Crowell, Kelley M. Gale Breton A. Peace, Brett P. Rosenblatt, and Kelly D. Thomason, attorneys in the Project Finance Practice Group in the San Diego office of Latham & Watkins LLP, “FINANCING THE NUCLEAR RENAISSANCE: THE BENEFITS AND POTENTIAL PITFALLS OF FEDERAL & STATE GOVERNMENT SUBSIDIES AND THE FUTURE OF NUCLEAR POWER IN CALIFORNIA,” Energy Law Journal, Vol. 30 No. 2

Federal and state policymakers in the United States are promoting clean energy as a principal solution to the problem of increasing greenhouse gas emissions that contribute to global warming in the face of predicted long term increases in the demand for energy.1 While these policymakers almost universally promote renewable energy generation, such as wind farms and solar projects, as a key part of that solution, many express reservations about the viability of new nuclear power as another important part of a green energy policy.2 Part of the reluctance to embrace nuclear power stems from doubts among policymakers about the appetite of banks and other private financiers to fund the enormous development and construction costs required to build new nuclear reactors in the face of political and other risks unique to nuclear projects.3 These doubts have been reinforced by recent instability in global credit and capital markets. Notwithstanding the reservations of some policymakers, the federal government has implemented a number of incentive programs to spur development, which will be discussed in depth in this article. On the other side of the basic development equation, banks and other potential private financiers and investors are uncertain about the political feasibility of pursuing new nuclear reactors and about the financing risks and complications associated with government licensing regimes and federal subsidies intended to facilitate the development of nuclear power projects.4 The core disjoint between the public regulatory and incentive frameworks intended to spur development and the less-than-exuberant responses from the private sector should elicit at least one bit of positive response from the nuclear industry: the fact that such a disjoint exists is evidence that nuclear power is back on the table in the United States after a prolonged absence from the public dialogue on smart energy policies. In fact, substantial efforts are now focused on the second order question of how to develop new nuclear power projects.

#### U.S. leadership is key – only direct government pressure solves.

CFR (Council on Foreign Relations), 7-5-2012, “The Global Nuclear Nonproliferation Regime,” http://www.cfr.org/proliferation/global-nuclear-nonproliferation-regime/p18984

International instruments for combating nuclear proliferation were largely successful before 1991, but are proving unable to meet today's challenges. Although three states (India, Israel, and Pakistan) are known or believed to have acquired nuclear weapons during the Cold War, for five decades following the development of nuclear technology, only nine states have developed—and since 1945 none has used—nuclear weapons. However, arguably not a single known or suspected case of proliferation since the early 1990s—Pakistan, Iraq, Iran, North Korea, Libya, or Syria— was deterred or reversed by the multilateral institutions created for this purpose. The continued advancement of Iran's nuclear program—despite the implementation of crosscutting economic sanctions and near universal global condemnation—has elicited serious concerns from states including Israel, the United States, and Saudi Arabia. Additionally, recent nonproliferation success stories, such as Libya's abandoning its nuclear program in 2003 and the accession of all of the Soviet successor states except Russia to the Nuclear Nonproliferation Treaty (NPT) as nonnuclear weapon states, have been the result of direct government-to-government negotiations and pressure rather than action by global bodies. In dealing with today's proliferation challenges, international organizations work in tandem with ad hoc forums of interested parties, such as the Six Party Talks on North Korea, the P5+1 grouping on Iran, and the most recent development of biannual global nuclear security summits. But such forums have often proven inadequate to arrest the spread of nuclear technology, and states such as Iran and North Korea continue to pursue nuclear capability, if not outright weaponization. Given these trends, rising doubts about the sustainability of the nonproliferation regime are no surprise.

#### Doesn’t solve prolif - IAEA verification lacks capacity detecting dual-use - fuel cycle is key.

CFR (Council on Foreign Relations), 7-25-2012, “The Global Nuclear Nonproliferation Regime,” http://www.cfr.org/proliferation/global-nuclear-nonproliferation-regime/p18984#p2

Some analysts note that the Nuclear Nonproliferation Treaty (NPT), which guarantees states' rights to develop civilian nuclear technology, enables a peaceful path to proliferation through fuel cycle activities. Many of the processes used to produce civilian nuclear power can be converted to military ends. As noted, the International Atomic Energy Agency does not have the capacity to adequately monitor every nuclear site. Iran has almost certainly used its civilian program as a cover for illicit weapons activities. The challenge of monitoring and verifying NPT safeguards will likely only increase as more countries look to nuclear power to offset volatile energy prices and reduce reliance on carbon-based fuels.In particular, several Middle Eastern countries that currently lack robust civilian nuclear programs have increasingly looked to diversify their economies through nuclear power. Other than safety risks commonly linked with the development of civilian nuclear programs, other countries may also fear that such programs will be used in the future to develop nuclear weapons. The latter concern is most commonly discussed in reference to Iran potentially developing nuclear weapons—regardless of that country's repeated assertions that its nuclear program is for peaceful purposes--and how such a development could affect regional security dynamics in the Middle East.

### 2AC China DA

#### PRISMs can use thorium – either China uses MSR’s which takes decades and doesn’t do anything or they use LWR’s causes a prolif risk.

Barry Brook & Tom Blees, 12-11-2011, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Guardian questions: thorium, shale gas, off-grid renewables, and much more…,” <http://bravenewclimate.com/2011/12/11/guardian-energy-questions/>

Barry makes an important point about uranium versus thorium, though he doesn’t state it in so many words: it’s not so much in the choice of actinide, the magic is in the Gen IV reactor types. Thorium metal in an IFR has many advantages, including less fissile startup needed, higher melting point than uranium metal, better mechanical properties (stronger) than uranium metal, higher chemical stability (only one valence), the option to denature the fissile isotopically (add U238 to the U233), reduced production of transplutonium elements, etc. But that’s just gravy. The biggest improvement is in the reactor type: passively safe, low pressure operation with non-volatile coolant, sustainable fuel cycle, very high proliferation resistance (low quality plutonium, fissile self sufficiency – no enrichment needed in the long term), greater thermal to electric efficiency, etc. This is true whether the fertile material is thorium or uranium. One could use existing plutonium waste to startup an IFR with thorium or uranium, or a combination of both, as the breeding material. The opposite is not true: one could not have a sustainable fuel cycle with existing reactors using thorium. Though thorium oxide’s high melting point makes today’s reactors much safer, thorium doesn’t make a reactor passively safe, like arranging for passive decay heat cooling, this is in the reactor design itself. Thorium doesn’t make high pressure reactors operate at low pressure, or increase the thermal to electrical conversion efficiency. The magic is in Gen IV reactors, in particular the low pressure higher temperature operating ones with passive cooling systems. To be more particular, sodium cooled, lead cooled, fluoride cooled and fluoride fuelled reactors. This is the way forward.

#### Multiple hurdles for commercialization and an increase in the risk of proliferation.

Arjun Makhijani & Michele Boyd, 2009, President of IEER, holds a Ph.D. in engineering (specialization: nuclear fusion) from the University of California at Berkeley. He has produced many studies and articles on nuclear fuel cycle related issues, including weapons production, testing, and nuclear waste, over the past twenty years, Michele Boyd is the former director of the Safe Energy Program at Physicians for Social Responsibility, was the legislative director of Public Citizen’s Energy Program where she advocated for sound federal energy legislation and led the coalition to terminate the federal reprocessing program (GNEP), Global Outreach Coordinator and Staff Scientist at the Institute for Energy and Environmental Research (IEER), master’s degree in environmental policy from the University of Michigan, Physicians for Social Responsibility, “Thorium Fuel: No Panacea for Nuclear Power,” <http://ieer.org/wp/wp-content/uploads/2012/04/thorium2009factsheet.pdf>

Thorium “fuel” has been proposed as an alternative to uranium fuel in nuclear reactors. There are not “thorium reactors,” but rather proposals to use thorium as a “fuel” in different types of reactors, including existing light-water reactors and various fast breeder reactor designs. Thorium, which refers to thorium-232, is a radioactive metal that is about three times more abundant than uranium in the natural environment. Large known deposits are in Australia, India, and Norway. Some of the largest reserves are found in Idaho in the U.S. The primary U.S. company advocating for thorium fuel is Thorium Power (www.thoriumpower.com). Contrary to the claims made or implied by thorium proponents, however, thorium doesn’t solve the proliferation, waste, safety, or cost problems of nuclear power, and it still faces major technical hurdles for commercialization. Not a Proliferation Solution Thorium is not actually a “fuel” because it is not fissile and therefore cannot be used to start or sustain a nuclear chain reaction. A fissile material, such as uranium-235 (U-235) or plutonium-239 (which is made in reactors from uranium-238), is required to kick-start the reaction. The enriched uranium fuel or plutonium fuel also maintains the chain reaction until enough of the thorium target material has been converted into fissile uranium-233 (U-233) to take over much or most of the job. An advantage of thorium is that it absorbs slow neutrons relatively efficiently (compared to uranium-238) to produce fissile uranium-233. The use of enriched uranium or plutonium in thorium fuel has proliferation implications. Although U-235 is found in nature, it is only 0.7 percent of natural uranium, so the proportion of U-235 must be industrially increased to make “enriched uranium” for use in reactors. Highly enriched uranium and separated plutonium are nuclear weapons materials. In addition, U-233 is as effective as plutonium-239 for making nuclear bombs. In most proposed thorium fuel cycles, reprocessing is required to separate out the U-233 for use in fresh fuel. This means that, like uranium fuel with reprocessing, bomb-making material is separated out, making it vulnerable to theft or diversion. Some proposed thorium fuel cycles even require 20% enriched uranium in order to get the chain reaction started in existing reactors using thorium fuel. It takes 90% enrichment to make weapons-usable 2 uranium, but very little additional work is needed to move from 20% enrichment to 90% enrichment. Most of the separative work is needed to go from natural uranium, which has 0.7% uranium-235, to 20% U-235.

#### Very long timeframe even with optimal market conditions – an increase in incentives for thorium still won’t get fuel vendors on board.

UK NNL (National Nuclear Laboratory), August 2010, “The Thorium Fuel Cycle,” <http://ripassetseu.s3.amazonaws.com/www.nnl.co.uk/_files/documents/aug_11/NNL__1314092891_Thorium_Cycle_Position_Paper.pdf>

ThorEnergy advocates using plutonium as the initial “seed” material (the fissile material used to generate the neutrons to enable breeding to take place in the fertile thorium) for LWRs, prior to U-233 becoming available at a later stage. The plutonium would be incorporated in Th-Pu MOX fuel. They argue that Th-Pu MOX is fundamentally very similar to U-Pu MOX fuel and therefore that the R&D requirements would be much less onerous than would be necessary for a more radical design change. Nevertheless, ThorEnergy recognize that the large R&D investment will still be required and the timescale to commercial readiness will be long. There have been many other international thorium fuel studies, including several demonstration programs in the Shipping port prototype Pressurized Water Reactor (PWR) and High Temperature Reactors (HTRs). However, these were not subsequently progressed to full commercial deployment. The main reason has been that thorium is competing with the uranium/plutonium fuel cycle which is already very mature. To progress to commercial deployment would demand major investments from fuel vendors and utilities. Such investment has yet to be justified by market conditions and there is no immediate prospect of change in the next ten years. Beyond that, however, the conditions may favor thorium if uranium ore prices increase and/or uranium reserves become more scarce. In the event of thorium fuel cycles being adopted commercially in existing LWRs, the technology can be considered to be well understood, but not fully demonstrated. The historic experience in the Shipping port PWR cannot now be considered adequate to cover modern operating regimes and discharge burnups. Demonstration of thorium/U-233 fuels in commercial LWRs will therefore demand small scale testing in research reactors, followed by large scale tests in commercial reactors. Based on NNL’s knowledge and experience of introducing new fuels into modern reactors, it is estimated that this is likely to take 10 to 15 years even with a concerted R&D effort and investment before the thorium fuel cycle could be established in current reactors and much longer for any future reactor systems. Therefore it is not envisaged that thorium fuel in LWRs will be established in the next decade, but could be feasible in the following ten years if the market conditions are conducive.

### 2AC neoliberalism

#### Utilitarianism is the only framework of evaluation and alternatives are inevitability self-contradictory.

Joseph S. Nye, 1986, Phd Political Science Harvard. University; Served as Assistant Secretary of Defense for International Security Affairs; “Nuclear Ethics,” pg. 18-19

The significance and the limits of the two broad traditions can be captured by contemplating a hypothetical case.34 Imagine that you are visiting a Central American country and you happen upon a village square where an army captain is about to order his men to shoot two peasants lined up against a wall. When you ask the reason, you are told someone in this village shot at the captain's men last night. When you object to the killing of possibly innocent people, you are told that civil wars do not permit moral niceties. Just to prove the point that we all have dirty hands in such situations, the captain hands you a rifle and tells you that if you will shoot one peasant, he will free the other. Otherwise both die. He warns you not to try any tricks because his men have their guns trained on you. Will you shoot one person with the consequences of saving one, or will you allow both to die but preserve your moral integrity by refusing to play his dirty game? The point of the story is to show the value and limits of both traditions. Integrity is clearly an important value, and many of us would refuse to shoot. But at what point does the principle of not taking an innocent life collapse before the consequentialist burden? Would it matter if there were twenty or 1,000 peasants to be saved? What if killing or torturing one innocent person could save a city of 10 million persons from a terrorists' nuclear device? At some point does not integrity become the ultimate egoism of fastidious self-righteousness in which the purity of the self is more important than the lives of countless others? Is it not better to follow a consequentialist approach, admit remorse or regret over the immoral means, but justify the action by the consequences? Do absolutist approaches to integrity become self-contradictory in a world of nuclear weapons? "Do what is right though the world should perish" was a difficult principle even when Kant expounded it in the eighteenth century, and there is some evidence that he did not mean it to be taken literally even then. Now that it may be literally possible in the nuclear age, it seems more than ever to be self-contradictory.35 Absolutist ethics bear a heavier burden of proof in the nuclear age than ever before.

#### Prefer our evidence – they conflate bad human decision making with capitalism.

Jay Richards, 2009, PhD with honors in Philosophy and Theology from Princeton, Money, Greed, and God: Why Capitalism Is the Solution and Not the Problem, p. 164

Too many critics confuse the free market with the bad choices free people make. Rod Dreher, for instance, chastises fellow conservatives, saying, “We look down on the liberal libertine who asserts the moral primacy of sexual free choice, but some- how miss that the free market we so uncritically accepts exalts personal fulfillment through individual choice as the summit of human existence.”9 Perhaps they miss that fact because it’s not a fact. The free market doesn’t exalt anything. Human beings exalt and denounce things like sexual free choice. Human beings might exalt “individual choice as the summit of human exis- tence,” but a system of free exchange doesn’t do that. In a free economy, sinful entrepreneurs may entice customers with pornography, and sinful customers may buy it. But having free choices in the market doesn’t dictate what people will choose. That’s the whole point of freedom: it always involves costs—that is, trade-offs. To choose one path is to foreclose the opposite path. Even God accepted trade-offs. He chose to create a world with free beings, one that allowed those beings to turn against him. And they did. But their freedom didn’t cause them to choose the bad. It just allowed them to. So, too, with a free economy. Critics notice all the vice present in free societies. But it is only in free societies that we can fully exercise our virtue. Charity is charity, for instance, only if it’s not coerced. Besides, there’s no evidence that state control of the economy makes a citizenry more virtuous. Every social ill in modern- day America, from widespread abortion and alcoholism to family breakdown, was much worse in statist and communist countries.

#### The move to PRISMs is necessary to solve the root causes of exploitation - ends want and war – great divide is based on mis-understanding.

David Walters, 6-14-2011, worked as a union power plant operator for 24 years in California, currently a member of Socialist Organizer, US Section of the Fourth International, Permanent Revolution, “FUKUSHIMA, NUCLEAR ENERGY AND A SOCIALIST PROGRAM,” <http://climateandcapitalism.com/2011/06/14/socialist-arguments-for-nuclear-power/>

We have serious issues facing our class, our planet. From economic development of the productive forces in the oppressed neo-colonial world to raise their standard of living, to the phasing out of climate-changing fossil fuel use, we are going to require more, not, less energy, specifically electricity. Most on the left are at best confused by this and at worse, seek a return to some sort of pastoral green, “democratic” pre-industrial utopia. As Marxists we should reject this “we use too much” scenario that has infected the left across the world. We certainly should use energy more wisely, more efficiently and with a sense of conservation. This can happen only when the profit motive is removed and scarcity in basic necessities is a thing of the past. No one should object to this. But these things do not produce one watt of power, especially if you consider what we have to do. These include: Switching off from fossil fuels completely (they should be used only as chemical feedstock, i.e. as the basic material to make chemicals and lubricants) Increasing the development of the productive forces especially in the developing world. This means developing whole electrical grids, new, primarily non-fossil fuel, forms of generation and the infrastructure to support this, for the billions without any electrical usage at all Freeing up the productive forces to eliminate all forms of want as the material basis for a true socialist mode of production. Using nuclear energy is both the cheapest and safest way to do this. George Monbiot in his latest entry on his blog\* challenges the renewable energy advocates with some hard questions. No socialist by any means, Monbiot has brought attention to the issue of energy and what it will take to reduce carbon emissions. He notes, writing on Britain, among other things: “1. Reducing greenhouse gas emissions means increasing electricity production. It is hard to see a way around this. Because low-carbon electricity is the best means of replacing the fossil fuels used for heating and transport, electricity generation will rise, even if we manage to engineer a massive reduction in overall energy consumption. The Zero Carbon Britain report published by the Centre for Alternative Technology envisages a 55% cut in overall energy demand by 2030 – and a near-doubling of electricity production.” How is this electricity going to be produced in a sustained and regular way? We know wind generated power is erratic and variable, a problem only partially solvable by new continental wide electricity grids. We know other forms of low carbon power – tidal, coal with carbon capture and storage, large scale solar – are experimental and even if viable are likely to turn out more expensive than nuclear. We get no answer from so-called socialist Greens on this problem, at least not yet. They simply have not considered the real issues. Monbiot goes on: “3. The only viable low-carbon alternative we have at the moment is nuclear power. This has the advantage of being confined to compact industrial sites, rather than sprawling over the countryside, and of requiring fewer new grid connections (especially if new plants are built next to the old ones). It has the following disadvantages: “a. The current generation of power stations require uranium mining, which destroys habitats and pollutes land and water. Though its global impacts are much smaller than the global impacts of coal, the damage it causes cannot be overlooked. “b. The waste it produces must be stored for long enough to be rendered safe. It is not technically difficult to do this, with vitrification, encasement and deep burial, but governments keep delaying their decisions as a result of public opposition. “Both these issues (as well as concerns about proliferation and security) could be addressed through the replacement of conventional nuclear power with thorium or integral fast reactors but, partly as a result of public resistance to atomic energy, neither technology has yet been developed. (I’ll explore the potential of both approaches in a later column).” I want to address this last point. Monbiot is slowly seeing his way to something that has taken a long time: that nuclear energy is really the only way to go, even in light of the “big three” accidents: Three Mile Island, Chernobyl and Fukushima. These new technologies he mentions, the Liquid Fluoride Thorium Reactor (which doesn’t require any uranium mining, enrichment or long term disposal of spent fuel) and the Integral Fast Reactor, provide the material basis for eliminating all fossil fuels and for a future society without want, wars or exploitation that is a socialist one. Where Monbiot and I come together is not, obviously, the socialist requirement to get rid of capitalism. It is over the need for more energy, not less. It is over the realization that renewables cannot do it except in the most utopian of fantasies. The real “Great Divide” is between those among the Greens who run on fear and fantasy, and those socialists that have a materialist understanding of the need to move toward a society based not just on current human needs alone, but on expanding humanity’s ability to power such a society. Only nuclear can do this.

#### Their impact cards don’t assume the world of the aff – PRISMs transform economic and geopolitical paradigms – eliminating gross inequality.

Tom Blees, 2008, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, Prescription for the Planet, p. 335-6

When the material comforts of existence are seen as being limited, then consumption beyond one’s needs does indeed carry an undeniable ethical weight. As Ralph Waldo Emerson put it lo those many years ago, “Superfluity is theft.” Even when the energy and raw materials involved are plentiful, there remains the often conveniently ignored issue of the conditions under which goods have been produced, be they agricultural or manufactured commodities. It is disingenuous in the extreme to point to the abolition of slavery as evidence of the social evolution of mankind when millions of desperately poor people labor under conditions that can still honestly be considered as slavery. The fact that we don’t335have slaves in our home is hardly confirmation of our benevolence. The moral questions of economic fairness will not be settled by availing ourselves of the technologies promoted in this book, but should command our attention and concern indefinitely. My point is not to justify exploitation of either human or material resources, but to point out that a transformation of energy and raw material technologies as proposed herein will present a radically transformed palette upon which to paint the picture of humanity’s future. Our new course will remove the limitations by which finite natural resources and energy supplies have circumscribed our existence. Unlimited energy coupled with virtually complete recycling of materials and the production of consumer goods from plentiful or renewable resources will finally allow humanity to be unshackled from the zero-sum mentality. Raising the living standards of our billions of disadvantaged brethren will be seen as a positive development by even the most voracious consumer societies, rather than perceived with foreboding as somehow detrimental to their way of life. Admittedly this will take some getting used to. The revolution will be not just technological and political, but psychological. The passion with which consumerism is pursued is frequently grotesque in its extremes, yet the revulsion it engenders may not be so strong when it can be viewed more as shallow foolishness than callous selfishness. Much of what is considered virtuous today will be seen more as simply a matter of personal preference in a world where creature comforts are no longer in limited supply. The concept of self-denial will have to be looked at anew. Rather than concentrating on husbanding limited resources, our attention can be turned to welcoming the rest of our fellow humans into a new reality where creature comforts are the universal norm. Abundant energy and wise336use of basic resources are the keys. Clearly the technologies are already within our grasp. This won’t happen overnight, but it would be foolish to dally. The conversion of primary power systems to fast reactors will necessarily be a gradual process, which in the best-case scenario will take a few decades. Conversion of the vehicle industry to boron, however, is another story. It is entirely conceivable that boron fueled vehicles could be driving on our highways within five years. Ironically the first boron recycling plants that would be a corollary of the conversion may end up operating with natural gas for their heat requirements, since the IFR program simply won’t be able to be implemented as quickly as the boron system, and it’s questionable whether existing electrical generation systems would be able to handle the increased demand of electrically powered boron recycling plants. This would, however, be only an interim fix, and would allow the vehicle fleets to get off to a quick start. If the plasma conversion method proves feasible, though, then garbage alone will provide all the energy we need for boron recycling. Long before the conversion to boron is complete, the demand for oil will have dropped to the point where the USA, one of the world’s thirstiest countries when it comes to oil, will be able to rely solely on North American supplies, resulting in geopolitical and economic realignments that will be a harbinger of things to come. Even though oil prices will surely plummet worldwide, and while the temporary price of boron recycling may well be higher than it will be once IFRs are able to provide all the power necessary to support the system, the price disparity will easily be great enough and the environmental benefits so overwhelming that boron vehicles will surely carry the day even in the near term.

#### This means the plan is a pre-requisite - criticizing the current economic system is insufficient without a specific and workable alternative – a moral stand is not enough to start a revolution.

Lawrence Grossburg, 1992, Professor of COMS at UNC, Communication Studies Professor at UNC, We Gotta Get Out of This Place, p. 388-89

If it is capitalism that is at stake, our moral opposition to it has to be tempered by the realities of the world and the possibilities of political change. Taking a simple negative relation to it, as if the moral condemnaotion of the evil of capitalism is sufficient (granting that it does establish grotesque systems of inequality and oppression) is not likely to establish a viable political agenda. First, it is not at all clear what it would mean to overthrow capitalism in the current situation. Unfortunately, despite our desires, the “masses” are not waiting to be led into revolution, and it is not simply a case of their failure to recognize their own best interests, as if we did. Are we to decide—rather undemocratically, I might add—to overthrow capitalism in spite of their legitimate desires? Second, as much as capitalism is the cause of many of the major threats facing the world, at the moment it may also be one of the few forces of stability, unity and even, within limits, a certain “civility” in the world. The working system is, unfortunately, simply too precarious and the alternative options not all that promising. Finally, the appeal of an as yet unarticulated and even unimagined future, while perhaps powerful as a moral imperative, is simply too weak in the current context to effectively organize people, and too vague to provide any direction. Instead, the Left must think of ways to rearticulate capitalism without either giving up the critique or naively assuming that it can create capitalism with a human heart.”

#### Nuclear power is the remedy to decades of environmental racism perpetuated by oil, coal, and other non-renewables.

Margaret Ryan and Dr. Patrick Moore 2012 May, 2 (Moore is a founding member of Greenpeace, Ph.D. in Ecology, and founder of CASEnergy) in “Nuclear Power Jobs Positioned As An Economic Justice Issue,” http://energy.aol.com/2012/05/02/nuclear-power-jobs-positioned-as-an-economic-justice-issue/

Who has the power in the power industry? Minority communities for years have seen large industrial facilities as environmental justice issues, says CASEnergy's Patrick Moore, with high-impact plants built in their midst because they're powerless to stop it, but he insists nuclear is different. Moore told AOL Energy that he is reaching out to African-American and Hispanic business and labor groups, telling them that nuclear plants, in contrast to projects like coal plants, are long-term community assets. Patrick Moore, an early Greenpeace activist and co-founder of CASEnergy who now supports nuclear as the largest non-polluting electricity source available, says nuclear not only needs thousands of skilled workers when plants are built new but generations of skilled workers to keep the units running for 60 or more years. The US Nuclear Regulatory Commission is just beginning to consider what safety standards are needed to extend US plants licenses from 60 to 80 years. African-American and Hispanic advocacy groups have historically been focused on civil rights, but they're "morphing into economic development," Moore said, and looking at energy policy for the first time. Unlike many other big industrial facilities, he noted, polls show nuclear power plants have increasing popular support the closer people live to them. Nuclear plants are "wealth creating machines," Moore said, with no pollution, better roads and schools financed by the plants' property taxes, and large payrolls. Moore said he has had positive reception from minority business leaders, and said he is urging minority business groups to "stream their members into training" for nuclear industry jobs. "Even if no new plants are built, the nuclear work force is aging," he said, echoing an issue discussed by both the NRC and the industry in recent years. "Over half the workforce is retiring in the next few years." Moore said that, despite the Fukushima disaster, he sees less controversy worldwide about nuclear power now than there was five years ago, in part as other countries see the increasing pollution and fossil fuel costs borne by Japan and Germany in the wake of politically forced nuclear shutdowns. AOL Energy covered the anniversary of the Fukushima disaster in detail with analysis of impacts for regulators, investors, the industry and suppliers. See that coverage here. Japan in April reported a $55 billion trade deficit for the fiscal year since Fukushima, due to lower exports from quake-affected industries and higher fuel imports. It was Japan's first deficit in three decades. On safety, Moore said, a key factor leading to the Fukushima events was the lack of an independent regulator in Japan, and that's not an issue for the US. "The regulatory authority was controlled by industry," he said. "In the US, the NRC is at arms' length, there is true independent oversight every day." CASEnergy is a coalition of business and advocacy groups, and Moore acknowledged that, with natural gas prices so low and supply so ample, it's hard to justify the expense of nuclear building unless a business can take a long view. Gas prices are historically volatile, he noted, but with so many utilities and merchant generators turning to cheap gas, "it will flip to a seller's market" in a few years, he argued, and "nuclear will start looking good again." Moore doesn't see why small modular reactors – the latest focus of industry and NRC attention – shouldn't be deployed to islands like Hawaii and Puerto Rico and isolated towns in Alaska to provide heat and power now supplied only by petroleum. "We already have 100 of them working in the Nuclear Navy," he said, noting Naval reactors predate the land-based ones. "For years we've had sailors living right next door to them."

### 2AC politics DA

#### No impact to decline.

Barbara Conry (former associate policy analyst, was a public relations consultant at Hensley Segal Rentschler and an expert on security issues in the Middle East, Western Europe, and Central Asia at the CATO Institute) and Charles V. Pena (Senior Fellow at the Independent Institute as well as a senior fellow with the Coalition for a Realistic Foreign Policy, and an adviser on the Straus Military Reform Project at the CATO Institute) 2003 “47. US Security Strategy” CATO Handbook for Congress, http://www.cato.org/pubs/handbook/hb108/hb108-47.pdf

Another rationale for attempting to manage global security is that a world without U.S. hegemony would soon degenerate into a tangle of chaos and instability, in which weapons proliferation, genocide, terrorism, and other offensive activities would be rampant. Prophets of such a development hint that if the United States fails to exercise robust political and military leadership today, the world is condemned to repeat the biggest mistakes of the 20th century—or perhaps do something even worse. Such thinking is seriously flawed. First, instability in the international system is nothing new, and most episodes do not affect U.S. vital interests. Furthermore, to assert that U.S. global leadership can stave off otherwise inevitable global chaos vastly overstates the power of any single country to influence world events. Indeed, many of the problems that plague the world today, such as civil wars and ethnic strife, are largely impervious to external solutions. There is little to back up an assertion that only Washington’s management of international security can save the world from political, economic, or military conflagration.

#### Won’t pass -

#### CIR won’t pass because there’s no legislative language.

WTVY, 1-28-2013, “Sessions: Comprehensive Reform Won’t Pass As Long As Admin Defies Existing Immigration Law,” <http://www.wtvy.com/home/headlines/Sessions-Comprehensive-Reform-Wont-Pass-As-Long-As-Admin-Defies-Existing-Immigration-Law-188735161.html>

U.S. Sen. Jeff Sessions (R-AL), Ranking Member of the Senate Budget Committee and former Ranking Member of the Senate Judiciary Committee, issued the following statement on the new push for comprehensive immigration reform and amnesty: “Americans overwhelmingly oppose illegal immigration. They have pleaded with Congress to end the mass illegality for decades to little avail. All the while, millions have been added to the total of those illegally here. It’s time to fix that broken system. Now we are told that the Obama Administration and members of Congress say they have a plan that they promise will do the job. So, the American people will need to watch closely. And, members of Congress must insist that they have a full and complete opportunity to study and amend such legislation. We would be in a much better position to achieve immigration reform if the Obama Administration had spent that last four years enforcing federal law rather than dismantling it. Brave immigration agents have been left with no recourse but to sue their own Department head, simply so that they—like any other law officers—will be allowed to do their jobs. Just last Friday a federal judge made an important preliminary ruling in their favor. The ICE union also held their own agency head, John Morton, in no confidence with a unanimous vote. The first task for every media agency in the country ought to be to study this lawsuit, to listen to the long-documented complaints of ICE agents, and to review the record of stymied attempts at congressional oversight of DHS. No comprehensive plan can pass Congress as long as this administration continues to defy existing federal law. What good are promises of future enforcement when the Administration covertly undermines those laws now in place? Yet, without consulting the law officers who have the duty to enforce the law, another group of senators, meeting in secret—just like the last time comprehensive reform failed—have set forth an outline with no legislative language. We have seen too often before that the promises made by bill sponsors do not match up to the reality when the language is produced. No secret accord with profound consequences for this nation’s future can be rushed through. That means a full committee process and debate and amendments on the floor of the Senate. Several points need to be understood. Amnesty will not help balance our budget. In fact, a large-scale amnesty is likely to add trillions of dollars to the debt over time, accelerate Medicare’s and Social Security’s slide into insolvency, and put enormous strain on our public assistance programs.

#### Obama involvement poisons the well.

Silvio Canto, Jr., 2-3-2012, American Thinker, “President Obama wants immigration reform to fail so that he can blame the GOP,” <http://www.americanthinker.com/blog/2013/02/president_obama_wants_immigration_reform_to_fail_so_that_he_can_blame_the_gop.html>

President Obama just signaled that he is not interested in immigration reform. He just told us that he wants a pathway to citizenship rather than working with the bipartisan deal that includes border security, guest worker visas and ultimately a path to legalization. President Obama wants a path to citizenship right away and did not mention "guest worker visas" in his speech. He has to know that those are "poison pills" for many Republicans, including the 4 Senators who are part of the compromise. What's President Obama up to? He wants immigration reform to fail. He wants to propose unrealistic plans and blame "los terrible republicanos" again. Most of all, he does not want an "up or down" vote because that will show that a lot of Democrats are uncomfortable with immigration reform too. Remember The Dream Act vote of 2010 that did not pass because of Senate Democrats? The Democrats have always been uncomfortable with "guest worker" visas. It won't be any different this time around when we get into details. Let's hope that Senator Rubio and the others understand who they are negotiating with. Unlike President Bush in 2007, who was committed to a bipartisan solution, President Obama is not. He wants the issue, the distraction and the opportunity to give a lot of meaningless "5 de Mayo" speeches proposing reforms without specifics. President Obama has one objective: He wants "hispanos" to show up in 2014 so that the Democrats have a chance to keep the US Senate and pick up the House. Without Hispanos, the GOP will do well in 2014 especially if we keep learning about the real cost of Obama-Care. Yes, President Obama does not want Hispanos talking about Obama-Care, a stagnant economy and the massive deficits that their children are about to inherit. Again, President Obama wants to distract Hispanos and blame the failure of immigration on "los terrible, racista y anti-imigrante republicanos".I hope that Senator Rubio understands that he is doing business with a first class demagogue in permanent campaign mode rather than a serious leader who wants solutions.

#### No trade-off – too much time.

UPI.com, 2-1-2013, “Senate won't rush immigration bill,” [www.upi.com/Top\_News/US/2013/02/01/Senate-wont-rush-immigration-bill/UPI-31311359732926/?spt=hs&or=tn](http://www.upi.com/Top_News/US/2013/02/01/Senate-wont-rush-immigration-bill/UPI-31311359732926/?spt=hs&or=tn)

Senate will not rush an immigration bill through and will instead put it through the traditional committee process, Democratic lawmakers say. Senate Majority Leader Harry Reid, D-Nev., said Thursday a full-fledged debate on immigration reform will be scheduled and a decision on the bill may not be reached until later this year, the Los Angeles Times reported. "This time we're going to get Republican votes," Reid said, adding that the Senate would try to "legislate the way we are supposed to legislate." In 2007, the Senate failed to pass an immigration bill that faced strong opposition from Senate Republicans who felt they were hit unexpectedly by the bill. "It was a mistake not to go through committee process the last time, as difficult as it is," said Sen. Charles E. Schumer, D-N.Y., who was a part of the immigration task force in 2007. "One of our goals is to pass this not with 60 votes — we want a large number of Republicans to vote for this because we think that will encourage the House to go forward and pass a bill." A key issue dividing Congress along party lines is agreeing on conditions to be met before illegal immigrants could be put on the path to citizenship, The Washington Post reported. A path to citizenship is "certainly going to be a problem in the House," said Rep. Bob Goodlatte, R-Va., chairman of the Judiciary Committee, which will hold a hearing next week on the issue. "There are a lot of options between deporting 11 million people, which most people don't believe will happen, and giving [them] citizenship." Meanwhile, President Barack Obama has urged Congress to act in a "timely fashion."

#### Partisanship and other items on the agenda thump reform.

Richard Cowan, 2-5-2013, “House Republicans try to chip away at immigration reform,” <http://www.reuters.com/article/2013/02/06/us-usa-immigration-idUSBRE9130V620130206>

The first major immigration reform effort since 1986 came under attack on Tuesday from congressional Republicans who cast doubt on a proposal backed by President Barack Obama to give 11 million illegal immigrants a chance to become citizens. An immigration overhaul suddenly looked possible last week when a group of senators from both parties launched a reform campaign. But it has not taken long for partisan rancor to emerge. Republicans in the House of Representatives are questioning a core element of the immigration plan: a path to citizenship for undocumented residents, most of them Hispanic, who are already in the United States. Bob Goodlatte, Republican chairman of the Judiciary Committee, raised the possibility of a "middle ground" between the current U.S. policy of deporting illegals and of placing them on a path to citizenship, as Obama demands." Are there options to consider between the extremes of mass deportation and pathway to citizenship?" the Virginia lawmaker asked during a session on immigration reform. Any challenge to the Democrats' goal of providing a route to citizenship might derail reform at a time when other divisive issues like gun control and deficit reduction share the legislative agenda. Some House Republicans are wary of a repeat of the last big immigration push in 1986, when about 3 million illegal immigrants were granted legal status. At the time, proponents of the overhaul said it would stem the flow of undocumented people across the Mexican border. But illegal immigration just got worse.

#### Gun control thumps

AP, 2-8-2013, “Keystone of Obama gun control plan gains steam as Dem, GOP senators seek background check pact,” Washington Post, http://www.washingtonpost.com/politics/congress/dem-gop-senators-quietly-seek-background-check-deal-that-could-improve-gun-control-prospects/2013/02/08/5362c63a-71cb-11e2-b3f3-b263d708ca37\_story.html

A cornerstone of President Barack Obama’s drive to check gun violence is gathering bipartisan steam as four senators, including two of the National Rifle Association’s congressional champions, privately seek compromise on requiring far more firearms purchasers to undergo background checks. The talks are being held even as Obama’s call to ban assault weapons and high-capacity ammunition magazines, the two other major pillars of his plan, are hitting rough waters on Capitol Hill. An agreement among the four senators to expand background checks would add significant impetus to that high-profile proposal by getting the endorsement of a group that ranges from one of the Senate’s most liberal Democrats to one of its most conservative Republicans.

#### The plan would be a political motivator for nuclear power development – solves the waste issue.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

Light-water reactors (LWR) of any stripe, however, produce only a tiny fraction of the potential energy in uranium, less than 1%. Fast reactors, in contrast, unlock nearly all of it. The IFR, with its metal-fuel system and pyroprocessing, is able to utilize the actinides to such an extent as to essentially solve the waste problem by reducing the radiological toxicity of the waste products from hundreds of thousands of years to a mere few hundred years. Even if the “million-year problem” of LWR spent fuel is more a political than a technical challenge (given the small volume of the waste stream), nevertheless the issue of public perception of that issue is the one that guides nuclear policy in many countries [14]. As such, the transition to fast reactors and a closed nuclear fuel cycle is both a technical advancement and a political enabler for nuclear power of all kinds.

#### Democrats will use the plan as a bargaining chip to overcome opposition.

Mariah Blake, January/February 2010, is an editor at the Washington Monthly; her work has also appeared in Christian Science Monitor and Foreign Policy, Mother Jones, “The Bailout Goes Nuclear,” <http://www.motherjones.com/environment/2010/01/bailout-nuclear>

Key Senate Democrats have signaled that they are willing to use nuclear subsidies as a bargaining chip to overcome Republican opposition. The Nuclear Energy Institute (NEI), the industry's main lobby, is pushing for at least $100 billion in federal loan guarantees—a dicey proposition given that the Congressional Budget Office has determined that the risk of default would be "well above 50 percent." This raises the question: Will the cost of passing a climate bill be a massive, taxpayer-funded nuclear bailout? The public has rescued the industry once before. The last batch of reactors built in the US during the 1970s and '80s was plagued by a series of boondoggles, one of the most infamous being Long Island's Shoreham Nuclear Power Plant, which took 20 years to build and cost $6 billion—more than 80 times the original estimate—but was never put into commercial operation. Similar debacles pushed utilities into bankruptcy, triggered the largest municipal bond default in US history, and helped cause a sixfold increase in wholesale electricity prices. The total cost to the public, in rate hikes and taxpayer bailouts, was more than $300 billion (in 2006 dollars), according to the Union of Concerned Scientists. Since that time, the industry says it has solved its cost problem, partly by engineering reactors that are simpler and less expensive to build. But the first two next-generation reactors, which are under construction in Finland and France, have been bogged down in multibillion-dollar cost overruns. Meanwhile, the projected cost of building new nuclear plants in the US is soaring: As recently as 2005, the NEI claimed new reactors could be constructed for roughly $2 billion. Newer estimates, including one by Moody's, the credit ratings agency, put the cost as high as $12 billion. That would make nuclear power more expensive on a watt-for-watt basis than most large-scale renewable energy sources, including wind, biomass, and hydropower. No wonder the industry has found it impossible to secure private-sector financing for the 28 reactors that are currently in the pipeline across the nation. Investors "will not accept the economic risk of building new reactors," says Peter Bradford, a former member of the Nuclear Regulatory Commission who is now a professor at Vermont Law School. "There will be no nuclear renaissance beyond what the government is willing to underwrite. "No one understands this better than the industry itself, which is lobbying for a Senate bill to create a Clean Energy Deployment Administration (CEDA) within the Department of Energy (DOE) that would have the authority to award a virtually unlimited number of loan guarantees—without congressional review. "It's a nuclear slush fund," says Michele Boyd, director of Physicians for Social Responsibility's safe energy program, "though the way the bill is written, even many Senate staffers don't know it." The legislation, which is likely to be folded into the climate bill, was sponsored by Sen. Jeff Bingaman (D-N.M.) and crafted with the help of Sen. Lisa Murkowski (R-Alaska). Both lawmakers are top recipients of the nuclear industry's campaign largesse. Under the policy, companies would have to pay an as yet unspecified subsidy fee in order to get loan guarantees, but these payments are all but certain to be dwarfed by the cost of defaults. According to the Union of Concerned Scientists, if 100 new plants are built, as key Republican lawmakers have called for, the price of bad loans could total at least $360 billion—and that's assuming zero cost overruns. The ceda provision builds on the work of Sen. Pete Domenici (R-N.M.), who until his retirement in January 2009 was the Senate's most tireless nuclear crusader. During his reign as chairman of the energy committee from 2003 to 2007, he packed the committee staff with former nuclear-power lobbyists—a clique dubbed "the glow-in-the-dark crew" by some of their Senate colleagues—who shepherded through Congress the Energy Policy Act of 2005. Among other things, the bill provided $13 billion in nuclear subsidies and federal loan guarantees to cover 80 percent of the costs of building low-carbon nuclear technologies, including new reactors. For any other industry, this would have been an enormous victory. But for nuclear, even these generous subsidies weren't enough. In July 2007, six of the nation's largest financial firms—including Citigroup, Lehman Brothers, and Goldman Sachs, companies hardly averse to risky investments—informed the DOE in a letter that nuclear projects would not find financing because they were too chancy. Unless, of course, the agency (which had interpreted the new law to mean 80 percent of project debt) would rewrite the rules so that 100 percent of the debt was covered—foisting almost all of the risk on taxpayers. By the end of 2007, the nuclear lobby had succeeded in getting the DOE to make exactly these changes. But to the industry's dismay, Congress has so far given the DOE authority to distribute $18.5 billion in loan guarantees for nuclear power facilities. That's less than half what UniStar hopes to spend on its four plants, not to mention the needs of the industry at large. So the industry began pushing to increase the funding and simultaneously exempt the program from congressional oversight. Part of NEI's strategy for getting the feds to hand out loan guarantees more freely has been to win over Democrats—who have traditionally been less friendly to nuclear power—by enlisting the help of organized labor. In mid-2008, the group added Michael Mathis and Charles Harple, previously top in-house lobbyists for the International Brotherhood of Teamsters, to its K Street bench. NEI also forged an alliance with the AFL-CIO. At NEI's annual conference in 2008, Mark Ayers, the AFL-CIO's president of Building and Construction Trades, said that in exchange for the industry's commitment to use union labor, his organization would work to "persuade the new majority in Congress about the need for extending and increasing the loan guarantee program." The industry's efforts began to pay off this fall, as nuclear subsidies emerged as the key to wooing Republican votes for a Senate climate bill—votes necessary to offset defections from coal-state Democrats. Since October, Sen. John Kerry (D-Mass.), one of the climate bill's sponsors, has been holding closed-door meetings with Republicans to craft nuclear language. "You listen to the rhetoric around this place and there is no one who will say a disparaging word about nuclear," says a senior Democractic Senate staffer close to the climate bill talks. "They have enough political muscle and enough support across the aisle that I think they will get all the loan guarantees they need."

#### Loan guarantees specifically popular to both sides of the aisle because of lower tax liability.

Sharon Squassoni, November 2009, is a senior associate at the Carnegie Endowment for International Peace in the nonprolifera-tion program. Prior to joining Carnegie, she held various positions in the US government, including at the Congressional research Service, the Arms Control and Disarmament Agency, and the US State Department, is a frequent contributor to journals, magazines and books on nuclear proliferation and defense, The Centre for International Governance Innovation, No. 7, “The US Nuclear Industry: Current Status and Prospects under the Obama Administration,” p. 8, <http://www.carnegieendowment.org/files/Nuclear_Energy_7_0.pdf>

The single most important spur to build new reactors in the United States is loan guarantees. In fact, industry sources indicate they are so critical that new plants may not be built without them. These guarantees are attractive to the US Congress because they offer a way to influence markets and incentivize specific projects, and because they are “scored” as a lower liability for the taxpayer than the actual amount. Thus, a potential US$50 billion in loan guarantees could be scored by the Congressional Budget Office as only costing the taxpayer US$500 million. As originally proposed in the Energy Policy Act (EPACT) of 2005, loan guarantees would only have applied to nuclear power, but this was broadened to apply to a wide range of “innovative energy technologies,” including renewable energy technologies, which further extends their attractiveness within Congress.

#### Nuclear makes it distinct to Congress.

Jim Snyder, 9-14-2012, Bloomberg, “Republican-Led House Passes Bill to Block Energy Loans,” <http://www.bloomberg.com/news/2012-09-14/republican-led-house-passes-bill-to-block-energy-loans.html>

The U.S. House passed legislation to end an energy loan-guarantee program, the culmination of a Republican-led investigation into the collapse of solar-panel maker Solyndra LLC last year. The “No More Solyndras Act,” adopted by a 245-161 vote, wouldn’t immediately halt the loan program. It would prevent the Energy Department from considering applications for government backing submitted since Dec. 31. With $34 billion in loan authority remaining, Democrats said the bill would let nuclear- power projects favored by Republicans go forward.

#### Political capital theory not true, but winners-win is\*\*\*

Michael Hirsh, 2-7-2013, is chief correspondent for National Journal, he also contributes to 2012 Decoded, previously served as the senior editor and national economics correspondent for Newsweek, based in its Washington bureau, was also Newsweek’s Washington web editor and authored a weekly column for Newsweek.com, NationalJournal, “There’s No Such Thing as Political Capital,” <http://www.nationaljournal.com/magazine/there-s-no-such-thing-as-political-capital-20130207>

\*\*\*cites George Edwards, a presidential scholar at Texas A&M University, Richard Bensel, a government professor at Cornell University, and Norman Ornstein of the American Enterprise Institute\*\*\*

On Tuesday, in his State of the Union address, President Obama will do what every president does this time of year. For about 60 minutes, he will lay out a sprawling and ambitious wish list highlighted by gun control and immigration reform, climate change and debt reduction. In response, the pundits will do what they always do this time of year: They will talk about how unrealistic most of the proposals are, discussions often informed by sagacious reckonings of how much “political capital” Obama possesses to push his program through. Most of this talk will have no bearing on what actually happens over the next four years. Consider this: Three months ago, just before the November election, if someone had talked seriously about Obama having enough political capital to oversee passage of both immigration reform and gun-control legislation at the beginning of his second term—even after winning the election by 4 percentage points and 5 million votes (the actual final tally)—this person would have been called crazy and stripped of his pundit’s license. (It doesn’t exist, but it ought to.) In his first term, in a starkly polarized country, the president had been so frustrated by GOP resistance that he finally issued a limited executive order last August permitting immigrants who entered the country illegally as children to work without fear of deportation for at least two years. Obama didn’t dare to even bring up gun control, a Democratic “third rail” that has cost the party elections and that actually might have been even less popular on the right than the president’s health care law. And yet, for reasons that have very little to do with Obama’s personal prestige or popularity—variously put in terms of a “mandate” or “political capital”—chances are fair that both will now happen. What changed? In the case of gun control, of course, it wasn’t the election. It was the horror of the 20 first-graders who were slaughtered in Newtown, Conn., in mid-December. The sickening reality of little girls and boys riddled with bullets from a high-capacity assault weapon seemed to precipitate a sudden tipping point in the national conscience. One thing changed after another. Wayne LaPierre of the National Rifle Association marginalized himself with poorly chosen comments soon after the massacre. The pro-gun lobby, once a phalanx of opposition, began to fissure into reasonables and crazies. Former Rep. Gabrielle Giffords, D-Ariz., who was shot in the head two years ago and is still struggling to speak and walk, started a PAC with her husband to appeal to the moderate middle of gun owners. Then she gave riveting and poignant testimony to the Senate, challenging lawmakers: “Be bold.” As a result, momentum has appeared to build around some kind of a plan to curtail sales of the most dangerous weapons and ammunition and the way people are permitted to buy them. It’s impossible to say now whether such a bill will pass and, if it does, whether it will make anything more than cosmetic changes to gun laws. But one thing is clear: The political tectonics have shifted dramatically in very little time. Whole new possibilities exist now that didn’t a few weeks ago. Meanwhile, the Republican members of the Senate’s so-called Gang of Eight are pushing hard for a new spirit of compromise on immigration reform, a sharp change after an election year in which the GOP standard-bearer declared he would make life so miserable for the 11 million illegal immigrants in the U.S. that they would “self-deport.” But this turnaround has very little to do with Obama’s personal influence—his political mandate, as it were. It has almost entirely to do with just two numbers: 71 and 27. That’s 71 percent for Obama, 27 percent for Mitt Romney, the breakdown of the Hispanic vote in the 2012 presidential election. Obama drove home his advantage by giving a speech on immigration reform on Jan. 29 at a Hispanic-dominated high school in Nevada, a swing state he won by a surprising 8 percentage points in November. But the movement on immigration has mainly come out of the Republican Party’s recent introspection, and the realization by its more thoughtful members, such as Sen. Marco Rubio of Florida and Gov. Bobby Jindal of Louisiana, that without such a shift the party may be facing demographic death in a country where the 2010 census showed, for the first time, that white births have fallen into the minority. It’s got nothing to do with Obama’s political capital or, indeed, Obama at all. The point is not that “political capital” is a meaningless term. Often it is a synonym for “mandate” or “momentum” in the aftermath of a decisive election—and just about every politician ever elected has tried to claim more of a mandate than he actually has. Certainly, Obama can say that because he was elected and Romney wasn’t, he has a better claim on the country’s mood and direction. Many pundits still defend political capital as a useful metaphor at least. “It’s an unquantifiable but meaningful concept,” says Norman Ornstein of the American Enterprise Institute. “You can’t really look at a president and say he’s got 37 ounces of political capital. But the fact is, it’s a concept that matters, if you have popularity and some momentum on your side.” The real problem is that the idea of political capital—or mandates, or momentum—is so poorly defined that presidents and pundits often get it wrong. “Presidents usually over-estimate it,” says George Edwards, a presidential scholar at Texas A&M University. “The best kind of political capital—some sense of an electoral mandate to do something—is very rare. It almost never happens. In 1964, maybe. And to some degree in 1980.” For that reason, political capital is a concept that misleads far more than it enlightens. It is distortionary. It conveys the idea that we know more than we really do about the ever-elusive concept of political power, and it discounts the way unforeseen events can suddenly change everything. Instead, it suggests, erroneously, that a political figure has a concrete amount of political capital to invest, just as someone might have real investment capital—that a particular leader can bank his gains, and the size of his account determines what he can do at any given moment in history. Naturally, any president has practical and electoral limits. Does he have a majority in both chambers of Congress and a cohesive coalition behind him? Obama has neither at present. And unless a surge in the economy—at the moment, still stuck—or some other great victory gives him more momentum, it is inevitable that the closer Obama gets to the 2014 election, the less he will be able to get done. Going into the midterms, Republicans will increasingly avoid any concessions that make him (and the Democrats) stronger. But the abrupt emergence of the immigration and gun-control issues illustrates how suddenly shifts in mood can occur and how political interests can align in new ways just as suddenly. Indeed, the pseudo-concept of political capital masks a larger truth about Washington that is kindergarten simple: You just don’t know what you can do until you try. Or as Ornstein himself once wrote years ago, “Winning wins.” In theory, and in practice, depending on Obama’s handling of any particular issue, even in a polarized time, he could still deliver on a lot of his second-term goals, depending on his skill and the breaks. Unforeseen catalysts can appear, like Newtown. Epiphanies can dawn, such as when many Republican Party leaders suddenly woke up in panic to the huge disparity in the Hispanic vote. Some political scientists who study the elusive calculus of how to pass legislation and run successful presidencies say that political capital is, at best, an empty concept, and that almost nothing in the academic literature successfully quantifies or even defines it. “It can refer to a very abstract thing, like a president’s popularity, but there’s no mechanism there. That makes it kind of useless,” says Richard Bensel, a government professor at Cornell University. Even Ornstein concedes that the calculus is far more complex than the term suggests. Winning on one issue often changes the calculation for the next issue; there is never any known amount of capital. “The idea here is, if an issue comes up where the conventional wisdom is that president is not going to get what he wants, and he gets it, then each time that happens, it changes the calculus of the other actors” Ornstein says. “If they think he’s going to win, they may change positions to get on the winning side. It’s a bandwagon effect.”

## 1AR

### solvency

#### No repeat of Fukushima – redundant safety features and layered vessels.

Charles E. Till & Yoon Il Chang, 2011, longtime Associate Laboratory Director for Engineering Research at Argonne National Laboratory, directed civilian nuclear power reactor development at Argonne National Laboratory, PhD Engineering, Specialty Reactor Physics, Imperial College, University of London, National Research Council of Canada, United Kingdom Atomic Energy Authority , Fellow of the American Nuclear Society, awarded the Walker Cisler Medal, National Academy of Engineering, was at Argonne National Laboratory, General Manager of the Integral Fast Reactor Program, Associate Laboratory Director for Engineering Research, Interim Laboratory Director, Argonne Distinguished Fellow, Currently he also serves as the Chair of IAEA’s Technical Working Group on Nuclear Fuel Cycle Options and Spent Fuel Management, was awarded the U.S. Department of Energy’s prestigious E.O. Lawrence Award, a Fellow and a recipient of the Walker Cisler Medal of American Nuclear Society, M.E. in Nuclear Engineering from Texas A&M University, and his Ph.D. in Nuclear Science from The University of Michigan, Science Council for Global Initiatives (SCGI), Plentiful Energy: The Story of the Integral Fast Reactor, p. 140

Each system is safety-grade, a high standard of quality with increased attention to quality and correspondingly greater expense, and each has a back-up system in the event of failures. The backup systems, normally idle, are continuously monitored, inspected, and periodically tested to ensure readiness. There is an independently powered and instrumented reactor shutdown system, a safety-grade emergency heat removal system to remove decay heat by natural circulation after shutdown, a second independent off-site power connection, and a safety-grade on-site emergency power supply. The third level provides additional protection to the public for accidents that are not expected to happen ever, and for accidents that were not foreseen when the plant was designed. A second vessel surrounding the vessel containing the reactor core, called the “guard vessel,” will catch primary coolant from any breach of the primary coolant system. It is sized to ensure that the reactor core remains covered with sodium coolant so it will be cooled by the emergency heat removal system even if the primary reactor vessel fails. If primary coolant leaks into the reactor building air atmosphere, or if failures of the cladding and the primary system barriers lead to release of gaseous fission products, the reactor building itself is designed to contain any radioactivity. (It might be noted here that the hydrogen explosions that damaged the Japanese reactor buildings after the quake could not happen to the IFR as the sodium coolant and structures contain no hydrogen, no H2O as in an LWR.)

#### Pyroprocessing has been extensively researched and developed now – all we need is commercial investment.

Michael F. Simpson & Jack D. Law, February 2010, Princeton University with a Ph.D. in chemical engineering, currently a member of the research staff at INL, previously, he served as the manager of the Advanced Safeguards department, worked extensively with researchers and leaders from Korea Atomic Energy Research Institute, is a technical advisor to both Departments of State and Energy, PhD. MIT with an emphasis in chemical engineering, professor emeritus at the Vanderbilt University School of Engineering Department of Civil and Environmental Engineering, works at the INL, Idaho National Laboratory, “Nuclear Fuel Reprocessing,” p. 19, <http://www.inl.gov/technicalpublications/Documents/4460757.pdf>

Pyroprocessing utilizes molten salt electrolytes as the media rather than acidic aqueous solutions and organic solvents42. These electrolytes are principally used to support electrochemical separations such as uranium electrorefining and electrolytic reduction of oxide fuel. The process includes vacuum furnaces that accomplish salt/metal separations and melt metal deposits into ingots for either waste disposal or fuel fabrication. Ceramic and metal waste streams are generated that immobilize fission products and, optionally, plutonium and minor actinides into high level waste forms. For eventual commercial implementation, it is expected that plutonium and minor actinides will be recycled and used for fast reactor fuel fabrication. While this technology has yet to reach the commercialization stage, it has been the subject of extensive, government funded research and development worldwide in addition to the EBR II spent fuel treatment work in the U.S. For example, the Republic of Korea is currently pursuing a strategy of developing pyroprocessing technology for treatment of spent fuel from their commercial light water reactors to minimize volume of high level waste and possibly extract fissile actinides for eventual fabrication of fast reactor fuel43 44. Russia has already demonstrated production of MOX based on pyroprocessing and plans to develop a closed fuel cycle using the technology by 2020.

### condition CP

#### Loan guarantee predictability is critical to nuclear power.

Angelina Howard, 6-18-2007, Nuclear Energy Institute (NEI), “PANEL II OF A COUNCIL ON FOREIGN RELATIONS SYMPOSIUM; SUBJECT: CAN NUCLEAR ENERGY GO BEYOND THE ENERGY POLICY ACT OF 2005?,” Lexis Nexis

MS. HOWARD: Well, the incentives in the Energy Policy Act --- (laughter) -- well, the incentives in the Energy Policy Act, I think the thinking on that has evolved over -- since 2005, like many other things. And as we -- we saw a significant number of companies make the decisions to go forward with the combined construction and operant rating license after the act was passed and they -- they saw the production tax credits being included and some level of stand-by support, because the real uncertainty for nuclear was not in the technology; it was in the regulatory aspect, and would the new licensing process really work like it was intended to work? And so -- and, you know, there were reflections and memories of(Shoreham ?) and others that took so long or else were -- were never, you know, went into operation. So those were very important at the time, in 2005, as well as the loan guarantee.

#### Can’t solve – uncertainty over federal licensing will block new investment.

NPO (Nuclear Policy Outlook), January/February 2008, Semi-monthly newsletter analyzing policy matters that affect the nuclear industry,

 “Building Confidence in Licensing New U.S. Nuclear Plants," <http://nei.org/resourcesandstats/publicationsandmedia/newslettersandreports/nuclearpolicyoutlook/>

Addressing Investors’ Concerns Maintaining investor confidence in a new-plant project that will span many years is another concern. Companies have responded to this by allocating funds and other resources to projects on a step-by-step basis. Duke Energy, for example, has filed applications in North Carolina and South Carolina for approval to incur project costs through 2009. Still, constraints on supply have prompted some companies to order major components now regardless of their future decisions. One of the difficulties that companies face in financing major nuclear plant projects is this: The cost of the projects is large relative to the market capitalization of the companies planning to build them. The financial community understands that challenge and is supportive of the way companies are structuring their investment. “Companies have made prudent decisions about how to stage their investments in ways that are appropriate to the risk they are assuming,” said Jeffrey Holzschuh, vice chairman at Morgan Stanley. The federal loan guarantee program, which provides government backing for the financing of clean-energy projects, including new nuclear, is critical for new projects. The loan guarantee program was authorized in the Energy Policy Act of 2005. The legislation also included a form of insurance that will compensate companies if projects are delayed by the licensing process or litigation. In reality, the number of years before an investment in a new nuclear facility will show returns is one of the major concerns for investors. “The biggest risk in licensing is time,” Holzschuh said. The industry is working to reduce the length of time between the decision to pursue licensing a new plant and when operations begin from 10 years to seven years, according to NEI’s Heymer. Finding efficiencies and addressing shortcomings in the licensing process is one way to shrink the time required. Aggressive project management—pre-ordering components, increasing staff and detailed planning— is another way. But the key, say some industry executives, is that the earlier you begin work on a project, the sooner you see results. “Given the time required to build a new plant and complete it by 2014, we were prompt in beginning to address these challenges in 2004,” said Marilyn Kray, president of NuStart Energy Development, which, in partnership with the Tennessee Valley Authority, submitted a license application in October for a new reactor at TVA’s Bellefonte site in Alabama. “Now we have to address work force issues to ensure we have the trained staff to build and operate the new plants,” Kray said. “We also need to ensure that we will have the components and commodities necessary to build new reactors.” More than any other factor, say industry leaders, it is important that companies cooperate to The NRC also must look for ways to streamline the licensing process increase stakeholders’ confidence in the new-plant licensing process. without reducing its effectiveness. Companies need to share their experience with others that are using the same reactor design. Cooperation also is necessary in financing new plants. Ultimately, this cooperation will minimize the challenges that individual projects encounter as they become part of the expansion of the U.S. nuclear power sector.

### China DA

#### Thorium causes enough nuclear waste - causes containment shut down and high costs.

Dylan Ryan, 2011, Masters in Mechanical Engineering, specialization in technical aided engineering & materials, and a PhD in engineering energy systems from Stanford University, 15 years’ experience in natural convection and heat transfer, daryanenergyblog , “The Molten Salt Reactor concept,” <http://daryanenergyblog.wordpress.com/ca/part-8-msr-lftr/>

One other misconception on the internet is the view that a LFTR reactor will produce almost no nuclear waste, as the following You-tube video implies (or see this “activists” banner here). This is not the case. All the while during the plant’s operating life that chemical plant will be producing nuclear waste material, and as discussed earlier some of that is pretty “nasty stuff”. Not a lot of it per day, but it all adds up! Also the supporters of the LFTR seem to assume that this CPP can operate with 100% efficiency (i.e remove all the radioactive poisons). This would be very technically challenging, especially in the LFTR case given the importance about separating out of U-232 (and its Thallium-208 payload) from U-233 or indeed removal of protactinium-233 as well as a host of other nuclear “poisons” discussed. Buildup of these in the core both leads to increased irradiation of the core as well as the eventual shutdown of the nuclear reaction process altogether. A CPP facility capable of that level of operating efficiency would likely be physically very large. Given that it will be working with radioactive materials, and the real radiological hazard is a pipe burst (an all too common occurrence and any chemical plant, and especially likely at these sort of working temperatures and radiation levels), we would thus need to put the CPP underneath our concrete containment dome. Obviously a large CPP will not only be expensive to build and maintain but greatly increase the size of this containment structure, further increasing reactor construction costs as well as increasing construction time (and reducing the number of said reactors we commission in any given time period). And of course the supporters of the LF reactor concept have yet to come up with a functional design of a CPP.

#### It’s the only reactor that is ready for commercial deployment – no reverse modeling.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

The conferees also touched on other fast reactor and thermal reactor systems being considered today, in varying degrees of development: molten fluoride salt thorium reactors (LFTRs), liquid-salt-cooled pebble fuel systems, etc. [16] While some of these hold promise, none are near the level of readiness for near-term commercial-prototype deployment as the PRISM reactor and its metal-fuel technology. In addition, none of the immediate prospects can match the IFR concept in meeting all the goals of the Gen IV initiative.

#### No link trade –off no risk of commercialization.

Dan Meneley, 11-17-2011, Ph.D., Imperial College, University of London, England Reactor Physics specialty in the Department of Mechanical Engineering, International Nuclear Energy Academy Chairman, Currently Adjunct Professor, University of Ontario Institute of Technology, BraveNewClimate, “The IFR vs the LFTR: An Exchange of Emails,” <http://bravenewclimate.com/2011/11/17/ifr-lftr-exchange/>

We’ll see what others on this list have to say, but in my opinion, Carlsen’s enthusiasm for thorium is premature, to say the least. The ONLY significant advantage a thorium cycle would have over fast reactors with metallic fuel (IFR/PRISM) is its lower requirement for startup fissile. That advantage is offset by the fact that the thorium reactor is at a stage of development roughly equivalent to where the IFR was in 1975 — a promising idea with a lot of R&D needed to before it’s ready for a commercial demonstration — which puts its deployment about 20 years behind what could be the IFR’s schedule. The thorium community has not yet even agreed on what will be the optimum thorium technology to pursue. I think that thorium should indeed be investigated as a possible future competitor for the IFR. But what would be gained by putting off demonstrating the IFR/PRISM technology while waiting to see if thorium really lives up to its promise? Nothing would be lost by getting a fleet of IFRs up and running. They could be breeding fissile for decades while a possible thorium fleet gets up and running, and the IFR-bred fissile — several times more than was started with — could be used for expanding the hypothetical thorium fleet at the end of the IFRs’ lifetimes. If the current perceived urgency is to sequester plutonium to put it out of the reach of proliferators, that can be done much faster with early deployment of IFRs rather than by later deployment of thorium reactors — and each IFR will sequester 8 – 10 times as much plutonium (Pu) per GWe as a thorium reactor. On the matter of thorium, George and others have repeated a . . . realistic picture. [Boosting thorium] will do no good. This is another idealist’s dream, like large-scale wind energy. They only want to save the world and are not interested in practical details. If you’ve tried to do control, fuel cycle, and safety system design on a thorium reactor you’ll not be so enthusiastic. The flux shape is a strong function of the past flux shape — because of the protactinium. After you shut the thing down you must account for the later reactivity increase. And then there’s the detail of not having any fissile isotope to start up in the first place. If you’re using thoria fuel, how are you going to extract the U233 economically?

# Northwestern round 5

### solvency

#### Fast reactors is an answer to the waste management issue.

Tom Blees, 5-31-2011, is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, Idaho Samizdat: Nuke Notes, “Critique of MIT Nuclear Fuel Cycle Report,” <http://djysrv.blogspot.com/2011/05/critique-of-mit-nuclear-fuel-cycle.html>

The public views adequate nuclear waste management as a critical linchpin in further development of nuclear energy. The technical community, therefore, needs to provide a practical approach to deal with the waste issue. The Fukushima accidents call attention to the importance of managing spent fuel safely. It appears the best technical approach is extracting the actinides from spent fuel, which reduces the effective lifetime of nuclear wastes from ~300,000 years to ~300 years. Extracting actinides (and using them to generate power) is by far the best technical approach to dealing with nuclear wastes. The MIT Study fails to mention this important possibility. If actinide extraction is chosen as a pathway for waste “disposal,” the recovered actinides still must be transmuted to fissile material or fissioned directly. This can be done only in fast reactors. Actinides can be burned in fast reactors, generating energy and at the same time creating more fissile material for the future. A key advantage of fast reactors is that they can be utilized as “burners” when excess plutonium inventories exist, and then converted to “breeders” whenever needed. Only fast reactors can satisfy the waste-disposal mission simply and effectively while extending utilization of the uranium resources by more than two orders of magnitude. Thermal reactors—such as LWRs and high-temperature gas-cooled reactors—utilize less than 1% of uranium resources, even with recycling of plutonium and some of the uranium. Thermal-spectrum reactors, even optimized, can extend the resource utilization only marginally, and they cannot burn actinides effectively. Actinide recycling also requires an efficient processing technology, with improved economics and nonproliferation characteristics. The pyroprocessing technique based on electrorefining, developed in the IFR program, has the potential to recover the actinides from LWR spent fuel as well as to fully recycle fuel in fast reactors. The fundamentals of pyroprocessing have already been demonstrated – this is not new science. The technology is now ready for pilot-scale demonstration, and it should be given the highest priority. We do not need decades of R&D to pursue all esoteric ideas. We already have in our hands on the most advanced technology, technology that no other countries possess. The MIT Study also talks about the inter-generational equity considerations. We believe that our generation should demonstrate the technologies that will solve the energy supply and waste management problems, rather than proposing a century-long interim storage of the spent nuclear fuel.

#### Plan would force a reversal.

Peter A. Bradford, 3-24-2009, former member of the U.S. Nuclear Regulatory Commission and former chair of the Maine and New York utility commissions, testimony before the Senate Committee on Environment and Public Works Subcommittee on Clean Air and Nuclear Safety, Hearing on “Three Mile Island: Thirty Years of Lessons Learned,” http://www.nuclearfiles.org/menu/key-issues/nuclear-energy/issues/bradford\_tmi\_testimony.pdf

Finally, a word about the lessons of Three Mile Island for Congressional Oversight. If the message that the NRC gets from the Congressional oversight committees is that what’s wanted is strong commission focus on expedited licensing of new reactors and deemphasized enforcement, that message will have an effect over time. Senator Pete Domenici asserted in his 1998 book that he singled-handedly changed NRCs priorities in a 1998 meeting with the NRC chair in which he threatened to cut the agency’s budget by one-third if the NRC did not modify its “adversarial attitude” toward the industry.

### prolif

#### Domino theory is true - empirics prove.

Matthew Kroenig, 5-26-2012, assistant professor in the Department of Government at Georgetown University and a research affiliate with The Project on Managing the Atom at Harvard University, he served as a strategist on the policy planning staff in the Office of the Secretary of Defense where he received the Office of the Secretary of Defense’s Award for Outstanding Achievement. He is a term member of the Council on Foreign Relations and has held academic fellowships from the National Science Foundation, the Belfer Center for Science and International Affairs at Harvard University, the Center for International Security and Cooperation at Stanford University, and the Institute on Global Conflict and Cooperation at the University of California, “The History of Proliferation Optimism: Does It Have A Future?,” http://www.npolicy.org/article.php?aid=1182andrtid=2

Further proliferation. Nuclear proliferation poses an additional threat to international peace and security because it causes further proliferation. As former Secretary of State George Schultz once said, “proliferation begets proliferation.”[69] When one country acquires nuclear weapons, its regional adversaries, feeling threatened by its neighbor’s new nuclear capabilities, are more likely to attempt to acquire nuclear weapons in response. Indeed, the history of nuclear proliferation can be read as a chain reaction of proliferation. The United States acquired nuclear weapons in response to Nazi Germany’s crash nuclear program. The Soviet Union and China acquired nuclear weapons to counter the U.S. nuclear arsenal. The United Kingdom and France went nuclear to protect themselves from the Soviet Union. India’s bomb was meant to counter China and it, in turn, spurred Pakistan to join the nuclear club. Today, we worry that, if Iran acquires nuclear weapons, other Middle Eastern countries, such as Egypt, Iraq, Turkey, and Saudi Arabia, might desire nuclear capabilities, triggering an arms race in a strategically important and volatile region. Of course, reactive proliferation does not always occur. In the early 1960s, for example, U.S. officials worried that a nuclear-armed China would cause Taiwan, Japan, India, Pakistan, and other states to acquire nuclear weapons. [70] In hindsight, we now know that they were correct in some cases, but wrong in others. Using statistical analysis, Philipp Bleek has shown that reactive proliferation is not automatic, but that rather, states are more likely to proliferate in response to neighbors when three conditions are met 1) there is an intense security rivalry between the two countries, 2) the potential proliferant state does not have a security guarantee from a nuclear-armed patron 3) and the potential proliferant state has the industrial and technical capacity to launch an indigenous nuclear program.[71] In other words, reactive proliferation is real, but it is also conditional. If Iran enters the nuclear club, therefore, it is likely that some, but not all, of the countries that we currently worry about will eventually follow suit and become nuclear powers.We should worry about the spread of nuclear weapons in every case, therefore, because the problem will likely extend beyond that specific case. As Wohlstetter cautioned decades ago, proliferation is not an N problem, but an N+1 problem. Further nuclear proliferation is not necessarily a problem, of course, if the spread of nuclear weapons is irrelevant or even good for international politics as obsessionists and optimists protest. But, as the above discussion makes clear, nuclear proliferation, and the further nuclear proliferation it causes, increases the risk of nuclear war and nuclear terrorism, emboldens nuclear-armed states to be more aggressive, threatens regional stability, constrains U.S. freedom of action, and weakens America’s alliance relationships, giving us all good reason to fear the spread of nuclear weapons.

### warming

#### Transition from fossil fuels is key to solve warming - even if it increases construction emissions in the short term the plan ultimately solves.

NP. Myhrvold & K. Caldeira, 2012, member of intellectual ventures, and Caldeira, Dept. of Global Ecology Carnegie institute, “Greenhouse gases, climate change and the transition from coal to low-carbon electricity,” http://ftpcontent.worldnow.com/wowk/Carnegiestudy.pdf] /Wyo-MB

A transition from the global system of coal-based electricity generation to low-greenhouse-gas-emission energy technologies is required to mitigate climate change in the long term. The use of current infrastructure to build this new low-emission system necessitates additional emissions of greenhouse gases, and the coal-based infrastructure will continue to emit substantial amounts of greenhouse gases as it is phased out. Furthermore, ocean thermal inertia delays the climate benefits of emissions reductions. By constructing a quantitative model of energy system transitions that includes life-cycle emissions and the central physics of greenhouse warming, we estimate the global warming expected to occur as a result of build-outs of new energy technologies ranging from 100 GWe to 10 TWe in size and 1–100 yr in duration. We show that rapid deployment of low-emission energy systems can do little to diminish the climate impacts in the first half of this century. Conservation, wind, solar, nuclear power, and possibly carbon capture and storage appear to be able to achieve substantial climate benefits in the second half of this century; however, natural gas cannot.

#### Warming isn’t natural – science shows human emission based relationships are the only proven ones.

Donald R. Prothero, 3-1-2012, is Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, earned M.A., M.Phil. and Ph.D. degrees in geological sciences from Columbia University, currently the author, co-author, editor, or co-editor of 28 books and over 250 scientific papers, including five leading geology textbooks, Skeptic, Vol. 17 No. 2, “How We Know Global Warming is Real and Human Caused,” Ebsco Host

"It's just natural climatic variability." No, it is not. As I detailed in my 2009 book, Greenhouse of the Dinosaurs, geologists and paleoclimatologists know a lot about past greenhouse worlds, and the icehouse planet that has existed for the past 33 million years. We have a good understanding of how and why the Antarctic ice sheet first appeared at that time, and how the Arctic froze over about 3.5 million years ago, beginning the 24 glacial and interglacial episodes of the "Ice Ages" that have occurred since then. We know how variations in the earths orbit (the Milankovitch cycles) controls the amount of solar radiation the earth receives, triggering the shifts between glacial and interglacial periods. Our current warm interglacial has already lasted 10,000 years, the duration of most previous interglacials, so if it were not for global warming, we would be headed into the next glacial in the next 1000 years or so. Instead, our pumping greenhouse gases into our atmosphere after they were long trapped in the earth's crust has pushed the planet into a "super-interglacial," already warmer than any previous warming period. We can see the "big picture" of climate variability most clearly in ice cores from the EPICA (European Project for Ice Coring in Antarctica), which show the details of the last 650,000 years of glacial-inters glacial cycles (Fig. 2). At no time during any previous interglacial did the carbon dioxide levels exceed 300 ppm, even at their very warmest. Our atmospheric carbon dioxide levels are already close to 400 ppm today. The atmosphere is headed to 600 ppm within a few decades, even if we stopped releasing greenhouse gases immediately. This is decidedly not within the normal range of "climatic variability," but clearly unprecedented in human history. Anyone who says this is "normal variability" has never seen the huge amount of paleoclimatic data that show otherwise.\* "It's just another warming episode, like the Medieval Warm Period, or the Holocene Climatic Optimum or the end of the Little Ice Age." Untrue. There were numerous small fluctuations of warming and cooling over the last 10,000 years of the Holocene. But in the case of the Medieval Warm Period (about 950-1250 A.D.), the temperatures increased only 1°C, much less than we have seen in the current episode of global warming (Fig. 1). This episode was also only a local warming in the North Atlantic and northern Europe. Global temperatures over this interval did not warm at all, and actually cooled by more than 1°C. Likewise, the warmest period of the last 10,000 years was the Holocene Climatic Optimum ( 5,000-9,000 B.C.E.) when warmer and wetter conditions in Eurasia contributed to the rise of the first great civilizations in Egypt, Mesopotamia, the Indus Valley, and China. This was largely a Northern Hemisphere-Eurasian phenomenon, with 2-3°C warming in the Arctic and northern Europe. But there was almost no warming in the tropics, and cooling or no change in the Southern Hemisphere. [8] From a Eurocentric viewpoint, these warming events seemed important, but on a global scale the effect was negligible. In addition, neither of these warming episodes is related to increasing greenhouse gases. The Holocene Climatic Optimum, in fact, is predicted by the Milankovitch cycles, since at that time the axial tilt of the earth was 24°, its steepest value, meaning the Northern Hemisphere got more solar radiation than normal -- but the Southern Hemisphere less, so the two balanced. By contrast, not only is the warming observed in the last 200 years much greater than during these previous episodes, but it is also global and bipolar, so it is not a purely local effect. The warming that ended the Little Ice Age (from the mid-1700s to the late 1800s) was due to increased solar radiation prior to 1940. Since 1940, however, the amount of solar radiation has been dropping, so the only candidate remaining for the post-1940 warming is carbon dioxide. [9] "It's just the sun, or cosmic rays, or volcanic activity or methane." Nope, sorry. The amount of heat that the sun provides has been decreasing since 1940, [10] just the opposite of the critics' claims (Fig. 3). There is no evidence of an increase in cosmic ray particles during the past century. [11] Nor is there any clear evidence that large-scale volcanic events (such as the 1815 eruption of Tambora in Indonesia, which changed global climate for about a year) have any long-term effects that would explain 200 years of warming and carbon dioxide increase. Volcanoes erupt only 0.3 billion tons of carbon dioxide each year, but humans emit over 29 billion tons a year, [12] roughly 100 times as much. Clearly, we have a bigger effect. Methane is a more powerful greenhouse gas, but there is 200 times more carbon dioxide than methane, so carbon dioxide is still the most important agent. [13] Every other alternative has been looked at and can be ruled out. The only clear-cut relationship is between human-caused carbon dioxide increase and global warming.

#### No risk of adaptation – fragmentation and low genetic variability.

Christian Hof et. al, September 2011, Ph.D. Center for Macroecology and Evolution at the University of Copenhagen and the BIOCHANGE Lab at the Museo Nacional de Ciencias Naturales in Madrid, M.Sc animal ecology, nature conservation and zoology at the University of Marburg, Germany, working with Professor Hartmut S. Walter (UCLA) on the evaluation of the conservation value of the endangered Salton Sea ecosystem in Southern California, Scientific assistant at the UfZ – Centre for Environmental Research Leipzig-Halle, Irina Levinsky, Ph.D. International School of Biodiversity Sciences (ISOBIS), Center for Macroecology, Evolution and Climate at the University of Copenhagen, Miguel B. Araujo, Ph.D. in Geography at the University College London and the Natural History Museum, post-doctoral research in the ‘Centre d’Ecologie Fonctionelle et Evolutive‘ at the CNRS in Montpellier, Marie Curie fellowship to undertake research at the University of Oxford, University of Copenhagen as a visiting Associate Professor, Deputy Editor-in-Chief of Ecography and associate editor of the Journal of Biogeography, and is member of the scientific committee of DIVERSITAS’ bioDISCOVERY programme, senior researcher of the Spanish Research Council (CSIC) at the National Museum of Natural Sciences , member of the International Laboratory on Global Change, and Carsten Rahbek, director of Centre for Macroecology, member of the Royal Danish Academy of Sciences and Letters, International Biogeography Society Fulbright Scholar, Editor-in-Chief of Ecography, International Ph.D. School of Biodiversity Sciences (ISOBIS), Global Change Biology, Vol. 17 Issue 9, “Rethinking species' ability to cope with rapid climate change,” p. 2,989-9 , Ebsco Host

Habitat destruction and fragmentation may reduce the possibilities of species to survive climate change in suitable microclimatic pockets. Smaller and fewer habi-tat patches contain, by definition, fewer microclimatic areas suitable for the endurance of species during climatic changes (Fig. 1d–f). Additionally, smaller habi-tat patches sustain smaller populations, which show lower genetic and phenotypic variability (Jump & Pen˜uelas, 2005) – a prerequisite for rapid adaptive responses. Even pristine landscapes are geographically heterogeneous (see Fig. 1a–c for a schematic illustration) so phenotypic and the underlying genotypic variability are not evenly distributed in space. Consequently, even without the negative anthropogenic impact, the potential of species populations to adapt to climate change is unevenly distributed across space. Increasing fragmenta-tion of the remaining habitat patches is likely to exacer-bate this uneven distribution of the adaptive potential, due to the decline of phenotypic and genotypic variability both within and between populations. Thus, habitat frag-mentation reduces the potential of a species to respond with trait shifts due to lower phenotypic variability across its range. Fragmentation also impedes short- and long-distance dispersal processes (Fig. 1d–f, Fahrig & Merriam, 1994). This does not only reduce the potential of species to respond via range shifts; a reduced dispersal probability also impedes the exchange of individuals among popula-tions, thus lowering gene flow and therefore genotypic and phenotypic variability (Younget al., 1996), and, in turn, the ability of species to adapt to changing environ-mental conditions (Davis & Shaw, 2001).

### 2AC fetishization

#### Apocalyptic rhetoric motivates environmentalism.

Michael Salvador & Todd, 2-18-2011, is an Associate Professor in the Edward R. Murrow College of Communication at Washington State University and Todd Norton is an Assistant Professor in the Edward R. Murrow College of Communication at Washington State University, “The Flood Myth in the Age of Global Climate Change,” <http://dx.doi.org/10.1080/17524032.2010.544749>

For Killingsworth and Palmer (1996), use of apocalyptic rhetoric has shifted in response to the changing relationship between the prevailing paradigm of human domination over nature\*limitless American progress through technology and economic development\*and the oppositional environmental paradigm of humans as subject to nature and in need of ecologically sustainable practices. When this prevailing paradigm was at its zenith, stronger apocalyptic visions were advanced, as in Rachel Carson’s (1962) Silent Spring. As environmental activism took hold in the public consciousness, less threatening visions of the Earth’s future were offered, as in Barry Commoner’s (1971) The Closing Circle. Thus, apocalyptic rhetoric served as a malleable framework for discussing environmental problems, allowing those concerned to transform growing awareness of environmental problems ‘‘into acceptance of action toward a solution by prefacing the solution with a future scenario of what could happen if action is not taken, if the problem goes untreated’’ (Killingsworth & Palmer, 1996, p. 22).

#### Framing threats in terms of extinction necessary for survival.

Richard J. Epstein & Y. Zhao, Winter 2009, Lab of Medicine at Hong Kong, Laboratory of Computational Oncology, Department of Medicine, University of Hong Kong, Perspectives in Biology and Medicine, Vol. 52 No. 1, “The Threat That Dare Not Speak Its Name; Human Extinction,” JSTOR

Final ends for all species are the same, but the journeys will be different. If we cannot influence the end of our species, can we influence the journey? To do so—even in a small way—would be a crowning achievement for human evolution and give new meaning to the term civilization. Only by elevating the topic [End Page 121] of human extinction to the level of serious professional discourse can we begin to prepare ourselves for the challenges that lie ahead. Table 3.   Human Thinking Modes Relevant to Extinction: from Ego-Think to Eco-Think  The difficulty of the required transition should not be underestimated. This is depicted in Table 3 as a painful multistep progression from the 20th-century philosophical norm of Ego-Think—defined therein as a short-term state of mind valuing individual material self-interest above all other considerations—to Eco-Think, in which humans come to adopt a broader Gaia-like outlook on themselves as but one part of an infinitely larger reality. Making this change must involve communicating the non-sensationalist message to all global citizens that “things are serious” and “we are in this together”—or, in blunter language, that the road to extinction and its related agonies does indeed lie ahead. Consistent with this prospect, the risks of human extinction—and the cost-benefit of attempting to reduce these risks—have been quantified in a recent sobering analysis (Matheny 2007).  Once complacency has been shaken off and a sense of collective purpose created, the battle against self-seeking anthropocentric human instincts will have only just begun. It is often said that human beings suffer from the ability to appreciate their own mortality—an existential agony that has given rise to the great religions— but in the present age of religious decline, we must begin to bear the added burden of anticipating the demise of our species. Indeed, as argued here, there are compelling reasons for encouraging this collective mind-shift. For in the best of all possible worlds, the realization that our species has long-term survival criteria distinct from our short-term tribal priorities could spark a new social ethic to upgrade what we now all too often dismiss as “human nature” (Tudge 1989). [End Page 122]

### 2AC procurement CP

#### Consistent guarantees are needed to construct PRISMs – historic bureaucratic changes show it spooks investors.

Charles Ferguson, November 2011, is the Philip D. Reed senior fellow for science and technology at the Council on Foreign Relations (CFR), is also an adjunct professor in the security studies program at Georgetown University, where he teaches a graduate-level course titled “Nuclear Technologies and Security,” and an adjunct lecturer in the national security studies program at the Johns Hopkins University, where he teaches a graduate level course titled “Weapons of Mass Destruction Technologies,” served as the project director for the CFR-sponsored Independent Task Force on U.S. Nuclear Weapons Policy, scientist-inresidence at the Monterey Institute’s Center for Nonproliferation Studies (CNS), won the Robert S. Landauer Lecture Award from the Health Physics Society, Foreign Policy, Issue 189, “JAPAN MELTED DOWN. BUT THAT DOESN'T MEAN THE END OF THE ATOMIC AGE,” Ebsco Host

IN FACT, NUCLEAR POWER plants are relatively cheap to operate. Averaging the costs over the life of the operation, a safely run plant can even be a cash cow, generating power at as low as 6 cents per kilowatt-hour, comparable to a coal-fired power plant. The problem is getting them built. A large reactor can cost several billion dollars, and construction delays -- as well as slowdowns forced by inevitable legal challenges -- have been known to drive up construction costs by $1 million a day. This problem is nothing new; it has plagued the industry since the 1970s. Years before the Three Mile Island disaster turned public opinion against the atom, the U.S. nuclear sector was already in trouble on account of legal and bureaucratic changes enacted under Presidents Richard Nixon, Gerald Ford, and Jimmy Carter that made new plants easier to stop with lawsuits -- usually filed by environmental and citizens' groups -- and regulations more unpredictable. That spooked investors, who in turn raised interest rates on borrowing for plant developers. The then-ongoing recession, which depressed energy demand, didn't help; neither did the plummeting price of oil and deregulation of natural gas that followed in the 1980s. Today, the industry argues that plant construction can only happen with the help of tens of billions of dollars in federal loan guarantees, which transfer financial risks onto taxpayers.

#### This kills the entire industry.

Angelina Howard, 6-18-2007, Nuclear Energy Institute (NEI), “PANEL II OF A COUNCIL ON FOREIGN RELATIONS SYMPOSIUM; SUBJECT: CAN NUCLEAR ENERGY GO BEYOND THE ENERGY POLICY ACT OF 2005?,” Lexis Nexis

MS. HOWARD: Well, the incentives in the Energy Policy Act --- (laughter) -- well, the incentives in the Energy Policy Act, I think the thinking on that has evolved over -- since 2005, like many other things. And as we -- we saw a significant number of companies make the decisions to go forward with the combined construction and operant rating license after the act was passed and they -- they saw the production tax credits being included and some level of stand-by support, because the real uncertainty for nuclear was not in the technology; it was in the regulatory aspect, and would the new licensing process really work like it was intended to work? And so -- and, you know, there were reflections and memories of(Shoreham ?) and others that took so long or else were -- were never, you know, went into operation. So those were very important at the time, in 2005, as well as the loan guarantee.

#### Procurement is structurally anti-innovation

Jason Busch Executive Editor of Spend Matters May 12, 2009 “Procurement Innovation” — An Oxymoron? http://spendmatters.com/2009/05/12/procurement-innovation-an-oxymoron/

Mark Twain observed, “Everybody talks about the weather, but nobody ever does anything about it”. Well, doesn’t it also feel like this is the case for procurement innovation? One often hears declarations such as “Innovation is our first priority”! Usually, however, procurement professionals politely agree and then continue what they were doing before. Why is this? I think there are several reasons. For one, many procurement professionals are measured primarily on savings (correctly so), and they may be concerned that if they focus too much on innovation it might erode their negotiating position. Another reason innovation is uncommon is that procurement professionals’ approaches for gathering business requirements produce few new ideas: sending out e-mail requests that generate meager responses; brainstorming sessions that degenerate into complaints about today’s offerings; surveys that are either too long to get responses or too short to get meaningful input; ad hoc conversations.

#### CP seen as a stimulus – Republicans will revert to crisis economics

Nancy Cook Updated: February 5, 2013 February 5, 2013 Can Washington Break Its Addiction to Crisis Economics? http://www.nationaljournal.com/can-washington-break-its-addiction-to-crisis-economics-20130205

The question for 2013 is: Can politicians and policymakers wean themselves off the high of last-minute policy to create longer-term, less reactive plans to create jobs, or boost the housing market, or build better roads and bridges, or overhaul the tax code, or curb health care spending over the next two decades? Well, actually, yeah. They certainly have the power. It’s just not clear if there’s the political will. “These guys know how to govern,” says Sean West, a director at Eurasia Group, a consulting firm focused on political risk. “The lesson now is that economic fights can be done in parallel with other legislation.” That will be one of the challenges for President Obama’s upcoming State of the Union address on Feb. 12—laying out the way his liberal vision fits with the starker and more deadline-oriented fiscal battles we face in the coming months like the sequester, the appropriations process, and the debt ceiling. There’s some hope that the economic brinkmanship has subsided, because Congress voted to suspend the debt ceiling until May and has promised to produce budget blueprints through the more traditional route—called “regular order." But, there’s no guarantee that this normal process will produce anything workable, such as a budget agreement. And, it seems pretty clear that House Republicans will balk if Obama proposes big new stimulus spending for things like infrastructure projects and job-training programs.

#### Procurement discourages SME’s – biggest internal to innovation

[Small and Medium Enterprises – e.g. small business]

Report of the Procurement Innovation Group July 2009 Using Public Procurement to Stimulate Innovation and SME Access to Public Contracts http://etenders.gov.ie/Media/Default/SiteContent/LegislationGuides/Report%20of%20the%20Procurement%20Innovation%20Group.pdf

The Government is seeking to promote competition, innovation and value for money in the delivery of public services. To achieve this goal it is important to ensure that public sector practices do not disadvantage small businesses, as a large part of the creative ideas for new technologies comes from SMEs. An increased involvement of SMEs into public purchasing will result in higher competition for public contracts, leading to better value for money for contracting authorities. Many small firms may be discouraged from tendering for public sector contracts because of a number of perceived or real barriers. These include: n Not being aware of contract opportunities; n Believing that the processes involved in bidding are unnecessarily complex and costly; n Current trends in public sector procurement towards larger and longer contracts, and rationalizing the number of suppliers, meaning that smaller businesses often find the resulting contracts too large for them; and n Overly restrictive selection criteria.

#### DOD SMRs causes environmentalist backlash

Joseph Somsel, nuclear engineer with 35 years in the commercial nuclear power business, 10-13-2012, “Obama's War on Nuclear Power,” American Thinker, http://www.americanthinker.com/2012/10/obamas\_war\_on\_nuclear\_power.html

One bright spot was to be the DoE's continued support for the development of what are called "small modular reactors." These are to be much smaller than current reactors and passively safe. Supposedly, these features will allow easier, quicker construction and an opening into markets too small for traditional designs. Some think government interest is focused on independent power supply for military bases, for which these reactors would be well-suited. However, the applications for developmental cost-sharing are languishing, awaiting DoE's overdue approval. Cynical observers would predict that no announcement will occur until after the election. The Obama administration has more to lose politically from approval from its environmentalist base than it could possibly gain from nuclear supporters.

#### No green bubble and it does not apply to nuclear.

Tyler Hamilton, 8-6-2012, Clean Break, is editor-in-chief of Corporate Knights magazine and a business columnist for the Toronto Star, “Clean energy technologies? No bubble bursting there. Future is growth, growth, growth,” Lexis Nexis

That usually means cleaning it up, making it smarter and more reliable, and investing in clean technologies — from Canada, perhaps — that make it more robust and efficient. There are some commentators out there who like to point to very specific events as evidence that the clean energy and technology boom has gone bust. They point to the exaggerated Solyndra “scandal,” which saw the bankruptcy of the solar manufacturing start-up after it received — and had already burned through — funding that was secured via a $535 million (U.S.) loan guarantee from the U.S. Department of Energy. It makes for great politics, but the reality is that companies do sometimes fail and the public does often have flesh in the game. It’s not unique to clean energy. The loan guarantee program, after all, was designed for high-risk bets. Looked at objectively, the program has actually outperformed expectations. Solyndra and a handful of others are falling stars in a galaxy of promise. But Solyndra is just the start. Clean energy skeptics point to company closures and the collapse of many solar, wind and other cleantech-themed stocks. They cite how U.S. government stimulus spending for clean energy projects is coming to an end. They flag how several jurisdictions in Europe, which is dealing with unrelated economic problems, are reducing subsidies for renewable energy projects.The green dream is dead — or dying. It’s the message you get when listening to those, mostly living in a North American bubble, who doubted the vision in the first place. This cacophony ignores the incredible needs of countries like India, which is already among the top spenders in the world on clean-energy projects, having spent $10.2 billion on renewable energy in 2011. As the blackout suggests, the need to accelerate that spending has grown more urgent. Japan, meanwhile, is embracing renewable energy in a big way in the aftermath of the nuclear disaster at Fukushima. It just launched its own feed-in-tariff program —similar to the one in Ontario —aimed at aggressively spurring solar, wind and geothermal development to help reduce the country’s dependence on nuclear power. Bloomberg New Energy Finance reported this month that global investment in clean energy surged to $57 billion in the second quarter of 2012, up 24 per cent from the first quarter and carried largely by a stunning 92 per cent spending increase out of China. Investment is still down year-over- year —2011 wasn’t a great year generally, right? —but it’s on the upswing in 2012, hardly the sign of collapse. That boost from China is expected to continue, particularly in solar. As part of its 12th five-year economic plan, released in 2011, China originally expected to increase solar installations 20-fold by 2020. Last month it decided to draw forward that target to 2015, when it hopes to have 21 gigawatts of solar power capacity in place —enough to supply all of Ontario on a sunny spring day. Why is China moving in this direction? Economically, it carries long-term strategic importance. But China’s citizens are also growing fed up with unbearable air, water and soil pollution, so much so that there is a rise in violent protests breaking out across the country. The reason why clean energy isn’t a fad or a bursting bubble is that global problems such as climate change, pollution, poverty, food scarcity, crumbling legacy infrastructure, and access to clean water aren’t going away anytime soon. Renewable energy and other clean technologies may not be the only solution, but they are a big and growing part of it. Will nuclear help out? Maybe, but don’t count on it. Jeff Immelt, chief executive of General Electric, a big supplier of nuclear technology, told the Financial Times this week that it’s “really hard” these days to justify the cost of nuclear. “I think some combination of gas, and either wind or solar … that’s where we see most countries around the world going.”Ontario may want to reconsider plans for new nukes at Darlington. Fact is, renewable energy costs are falling fast, and that’s part of the reason there are layoffs, profit warnings, bankruptcies and falling share prices in the industry. Subsidies are supposed to gradually fade away, something the fossil fuel industry hasn’t learned after 100 years of handouts. There was oversupply in clean energy equipment. Weak companies are struggling and some are failing. Those intent on surviving figure out how to innovate, adjust, enter new geographic markets and come out stronger – the cycle is not unique to clean energy. “Any emerging market will experience growth problems and will have winners and losers. And the losers’ problems do not necessarily indicate the absence of a long-term market,” says Craig Tighe, a partner with global law firm DLA Piper. “Were that the case, the loss of Palm and Handspring would mean that the smart phone market is not sustainable, which is manifestly not the case.” Growth in clean energy is happening. What’s changing is the pace of that growth and the players who get to benefit. There’s no bubble bursting here.

#### Loan guarantees fill budget shortfalls – there is no creation of a bubble.

NEI, May 2011, Nuclear Energy Institute, “Financing New Nuclear Power Plants,” <http://www.nei.org/resourcesandstats/documentlibrary/newplants/policybrief/financingnewplants/>

The federal government manages a loan guarantee portfolio of $1.1 trillion. It uses loan guarantees widely and successfully to ensure investment in critical activities, including shipbuilding, transportation infrastructure, exports of U.S. goods and services, affordable housing, and many other purposes. The nuclear energy loan guarantee program is not a subsidy. Unlike other federal loan guarantee programs, including loan guarantees for renewable energy projects, nuclear project developers are required to pay the cost of the loan guarantee and the full cost of administering the Department of Energy program. The program addresses market imperfections that otherwise would restrict access to capital or impose inordinately high financing costs on projects. The Office of Management and Budget noted that federal credit programs, such as the energy loan guarantee program, “effectively fill the gaps created by market imperfections.” All clean-energy technologies are subject to the same rigorous due diligence to ensure that DOE’s loan guarantee program provides financing support only to viable projects that have an extremely high probability of being successful. Project-specific due diligence and underwriting evaluate the legal, technical and financial attributes of each project. DOE oversees this process in concert with outside legal and financial advisers, independent engineering consultants, and market experts. The analysis includes a rigorous assessment of the creditworthiness of the project, which can be measured accurately using well-established project financing ranking criteria. Opponents of nuclear energy have speculated about high default rates for new nuclear projects based on an outdated report by the Congressional Budget Office. The cited CBO estimate of a 50 percent default rate is an unsupported assertion from a 2003 CBO analysis of a different loan guarantee program that was never approved. A 2008 CBO report on the economics of new nuclear capacity found that nuclear energy would become a more attractive investment for new capacity than fossil-fueled power plants in a carbon-constrained world.

#### Nuclear power doesn’t skew the market - is cost competitive.

Alexander DeVolpi, 2-28-2010, been active in nuclear-arms policy and treaty-verification technology studies for over 25 years, Argonne National Laboratory, Argonne, Illinois (and other national laboratories) involved nearly 40 years of lab, field, and analytical activities in instrumentation, nuclear physics, nuclear engineering, reactor safety, radioisotopes, experiments, verification technology, and arms control, the Defense Nuclear Agency, On-Site Inspection Agency, all the Department of Energy weapons labs, with the Departments of Defense and State, author or coauthor of several books, Ph.D. in physics (and MS in nuclear engineering physics) from Virginia Polytechnic Institute, certificate from the Argonne International Institute of Nuclear Science and Engineering, managing nuclear diagnostics for the Reactor Analysis and Safety Division at Argonne, and becoming technical manager of the arms-control and nonproliferation program, Who’s Who in Frontiers of Science and Technology, American Men and Women of Science, fellow of the American Physical Society, technical consultant in the Federation of American Scientists/Natural Resources Defense Council joint project, ScienceTechnologyHistory, “NUCLEAR EXPERTISE: The Amory Lovins Charade,” <http://sciencetechnologyhistory.wordpress.com/article/nuclear-expertise-the-amory-lovins-1gsyt5k142kc5-20/>

Nuclear power is not only commercially competitive, but extremely safe (no coal miners dying), no air pollution at all, no greenhouse gas emissions (such as carbon-dioxide). Nuclear-plant lifetime is being doubled from 30 to 60 years (which utilities, investors, and ratepayers appreciate). If Lovins had his way 30 years ago, considerably more particulates and gases would have been vented to the local and regional atmosphere from coal-fired plants (aside from the greenhouse gases emitted). Moreover, if Lovins had his way, we would not have conserved the electricity-equivalent in domestic coal, imported and domestic oil, and domestic and imported natural-gas resources and reserves that we have for 30 years. A typical nuclear power plant each year avoids consumption of 3.4 million short tons of coal, or 65.8 billion cubic feet of natural gas, or 14 billion barrels of oil. (The United States has ample uranium resources.) So Lovins was wrong in implying that nuclear had no overriding societal or environmental benefits. Incidentally, it’s no accident that Illinois has the highest concentration of nuclear-power plants in the United States: Argonne National Laboratory can be proud of its half-century nuclear stewardship. (California, by the way, generates more electricity from geothermal, solar, and wind energy sources combined than any other State.) Lovins displayed complex viewgraphs that, he purports, show that nuclear is the costliest of “low-or-non-nuclear resources.” Yet, in the last 30 years, nuclear has displaced half the fossil-fuel combustion in Illinois while still being competitive. Inasmuch as nuclear-power plants emit no byproduct carbon-dioxide to the atmosphere, surely his claim that it is the costliest of low-carbon-emission sources fails the smell test. Most of Lovins’ pricing and cost/benefit comparisons are based on “new delivered electricity” which frames the cost of U.S. domestic nuclear construction in the least favorable light. He declares nuclear power an economic failure. Can someone explain that to my bank account which has benefitted from compounding competitive electric power savings for the past 30 years? His rimy claim certainly fails the ripeness test. On the issue of electrical-grid reliability, Lovins asserts that there is no such thing as a “outage-free” source of electrical power. He must think that nuclear power runs by government fiat. Nuclear is a fixture on the grid because it is more economical to operate as base-load supply, while sources less reliable, intermittent, and more costly (such as wind, solar, and gas) provide supplementary power. During the past 30 years in Illinois, I don’t recall having the electricity supply and cost problems that California has had after it prohibited nuclear-power plants from being built within its borders. By the way, average U.S. nuclear capacity factor was about 92% in 2007. That’s excellent. Lovins pitiful effort to undermine the reliability of nuclear power egregiously fails the smell test.

### 2AC politics DA

#### U.S. and Latin American relations are resilient

Theodore H. Moran, Professor of International Business, “Latin America and the Global Economy,” cfr, November 26, 2012, http://www.cfr.org/south-america/latin-america-global-economy/p29531.

Claudio, I'm going to lead off with you. There are many ways of saying the same thing. When the United States catches a cold, Latin -- sneezes, Latin America catches a cold. When the international financial system shows some weakness, Latin America shows huge banking crises. But we didn't really have that coming out of the last financial crisis. We actually had a fairly resilient reaction in Latin America. Would you give us some perspective on that, please?

#### Relations resilient – don’t care about immigration – economic engagement is key

Arturo Valenzuela, Assistant Secretary, Bureau of Western Hemisphere Affairs, “U.S.-Latin American Relations: A Look Ahead,” State, January 6, 2011, <http://www.state.gov/p/wha/rls/rm/2011/154105.htm>

Moreover, the Obama Administration’s new strategy of engagement has contributed to a shift in Latin American public opinion. In the 2010 poll by the public opinion research firm Latinobarometro, two-thirds of the population in most countries had favorable attitudes toward the United States – an increase of 10 to 20 points from 2008 levels. The role of the United States in Latin America is also overwhelmingly viewed as positive. This suggests that the Obama Administration’s strategy has prompted an important replenishment of U.S. soft power in Latin America, thereby reversing the dangerous depletion of good will toward the United States that had occurred during the prior decade. Indeed, the region’s reaction to the recent Wikileaks cables incident, far from disrupting our regional relations, has actually highlighted their renewed strength. While the United States deeply regrets the disclosure of any information that was intended to be confidential, we are also heartened by the support and understanding that has been offered by most of our regional partners.¶ We also recognize the central role played by economic integration in our hemispheric relations. In 2009, total U.S. merchandise trade between the United States and Latin America and the Caribbean reached $524 billion and more than 40 percent of the region’s exports flowed to the United States, making us the region’s single largest export destination – as well as the largest source of foreign direct investment – and the Western Hemisphere, including Canada, absorbs 42 percent of U.S. exports. Around 84 percent of our overall trade with the region takes place with our FTA partners. Half of our energy imports come from the Western Hemisphere.

#### Won’t pass -

#### CIR won’t pass because there’s no legislative language.

WTVY, 1-28-2013, “Sessions: Comprehensive Reform Won’t Pass As Long As Admin Defies Existing Immigration Law,” <http://www.wtvy.com/home/headlines/Sessions-Comprehensive-Reform-Wont-Pass-As-Long-As-Admin-Defies-Existing-Immigration-Law-188735161.html>

U.S. Sen. Jeff Sessions (R-AL), Ranking Member of the Senate Budget Committee and former Ranking Member of the Senate Judiciary Committee, issued the following statement on the new push for comprehensive immigration reform and amnesty: “Americans overwhelmingly oppose illegal immigration. They have pleaded with Congress to end the mass illegality for decades to little avail. All the while, millions have been added to the total of those illegally here. It’s time to fix that broken system. Now we are told that the Obama Administration and members of Congress say they have a plan that they promise will do the job. So, the American people will need to watch closely. And, members of Congress must insist that they have a full and complete opportunity to study and amend such legislation. We would be in a much better position to achieve immigration reform if the Obama Administration had spent that last four years enforcing federal law rather than dismantling it. Brave immigration agents have been left with no recourse but to sue their own Department head, simply so that they—like any other law officers—will be allowed to do their jobs. Just last Friday a federal judge made an important preliminary ruling in their favor. The ICE union also held their own agency head, John Morton, in no confidence with a unanimous vote. The first task for every media agency in the country ought to be to study this lawsuit, to listen to the long-documented complaints of ICE agents, and to review the record of stymied attempts at congressional oversight of DHS. No comprehensive plan can pass Congress as long as this administration continues to defy existing federal law. What good are promises of future enforcement when the Administration covertly undermines those laws now in place? Yet, without consulting the law officers who have the duty to enforce the law, another group of senators, meeting in secret—just like the last time comprehensive reform failed—have set forth an outline with no legislative language. We have seen too often before that the promises made by bill sponsors do not match up to the reality when the language is produced. No secret accord with profound consequences for this nation’s future can be rushed through. That means a full committee process and debate and amendments on the floor of the Senate. Several points need to be understood. Amnesty will not help balance our budget. In fact, a large-scale amnesty is likely to add trillions of dollars to the debt over time, accelerate Medicare’s and Social Security’s slide into insolvency, and put enormous strain on our public assistance programs.

#### Obama involvement poisons the well.

Silvio Canto, Jr., 2-3-2012, American Thinker, “President Obama wants immigration reform to fail so that he can blame the GOP,” <http://www.americanthinker.com/blog/2013/02/president_obama_wants_immigration_reform_to_fail_so_that_he_can_blame_the_gop.html>

President Obama just signaled that he is not interested in immigration reform. He just told us that he wants a pathway to citizenship rather than working with the bipartisan deal that includes border security, guest worker visas and ultimately a path to legalization. President Obama wants a path to citizenship right away and did not mention "guest worker visas" in his speech. He has to know that those are "poison pills" for many Republicans, including the 4 Senators who are part of the compromise. What's President Obama up to? He wants immigration reform to fail. He wants to propose unrealistic plans and blame "los terrible republicanos" again. Most of all, he does not want an "up or down" vote because that will show that a lot of Democrats are uncomfortable with immigration reform too. Remember The Dream Act vote of 2010 that did not pass because of Senate Democrats? The Democrats have always been uncomfortable with "guest worker" visas. It won't be any different this time around when we get into details. Let's hope that Senator Rubio and the others understand who they are negotiating with. Unlike President Bush in 2007, who was committed to a bipartisan solution, President Obama is not. He wants the issue, the distraction and the opportunity to give a lot of meaningless "5 de Mayo" speeches proposing reforms without specifics. President Obama has one objective: He wants "hispanos" to show up in 2014 so that the Democrats have a chance to keep the US Senate and pick up the House. Without Hispanos, the GOP will do well in 2014 especially if we keep learning about the real cost of Obama-Care. Yes, President Obama does not want Hispanos talking about Obama-Care, a stagnant economy and the massive deficits that their children are about to inherit. Again, President Obama wants to distract Hispanos and blame the failure of immigration on "los terrible, racista y anti-imigrante republicanos".I hope that Senator Rubio understands that he is doing business with a first class demagogue in permanent campaign mode rather than a serious leader who wants solutions.

#### No trade-off – too much time.

UPI.com, 2-1-2013, “Senate won't rush immigration bill,” [www.upi.com/Top\_News/US/2013/02/01/Senate-wont-rush-immigration-bill/UPI-31311359732926/?spt=hs&or=tn](http://www.upi.com/Top_News/US/2013/02/01/Senate-wont-rush-immigration-bill/UPI-31311359732926/?spt=hs&or=tn)

Senate will not rush an immigration bill through and will instead put it through the traditional committee process, Democratic lawmakers say. Senate Majority Leader Harry Reid, D-Nev., said Thursday a full-fledged debate on immigration reform will be scheduled and a decision on the bill may not be reached until later this year, the Los Angeles Times reported. "This time we're going to get Republican votes," Reid said, adding that the Senate would try to "legislate the way we are supposed to legislate." In 2007, the Senate failed to pass an immigration bill that faced strong opposition from Senate Republicans who felt they were hit unexpectedly by the bill. "It was a mistake not to go through committee process the last time, as difficult as it is," said Sen. Charles E. Schumer, D-N.Y., who was a part of the immigration task force in 2007. "One of our goals is to pass this not with 60 votes — we want a large number of Republicans to vote for this because we think that will encourage the House to go forward and pass a bill." A key issue dividing Congress along party lines is agreeing on conditions to be met before illegal immigrants could be put on the path to citizenship, The Washington Post reported. A path to citizenship is "certainly going to be a problem in the House," said Rep. Bob Goodlatte, R-Va., chairman of the Judiciary Committee, which will hold a hearing next week on the issue. "There are a lot of options between deporting 11 million people, which most people don't believe will happen, and giving [them] citizenship." Meanwhile, President Barack Obama has urged Congress to act in a "timely fashion."

#### Partisanship and other items on the agenda thump reform.

Richard Cowan, 2-5-2013, “House Republicans try to chip away at immigration reform,” <http://www.reuters.com/article/2013/02/06/us-usa-immigration-idUSBRE9130V620130206>

The first major immigration reform effort since 1986 came under attack on Tuesday from congressional Republicans who cast doubt on a proposal backed by President Barack Obama to give 11 million illegal immigrants a chance to become citizens. An immigration overhaul suddenly looked possible last week when a group of senators from both parties launched a reform campaign. But it has not taken long for partisan rancor to emerge. Republicans in the House of Representatives are questioning a core element of the immigration plan: a path to citizenship for undocumented residents, most of them Hispanic, who are already in the United States. Bob Goodlatte, Republican chairman of the Judiciary Committee, raised the possibility of a "middle ground" between the current U.S. policy of deporting illegals and of placing them on a path to citizenship, as Obama demands." Are there options to consider between the extremes of mass deportation and pathway to citizenship?" the Virginia lawmaker asked during a session on immigration reform. Any challenge to the Democrats' goal of providing a route to citizenship might derail reform at a time when other divisive issues like gun control and deficit reduction share the legislative agenda. Some House Republicans are wary of a repeat of the last big immigration push in 1986, when about 3 million illegal immigrants were granted legal status. At the time, proponents of the overhaul said it would stem the flow of undocumented people across the Mexican border. But illegal immigration just got worse.

#### Gun control thumps

AP, 2-8-2013, “Keystone of Obama gun control plan gains steam as Dem, GOP senators seek background check pact,” Washington Post, http://www.washingtonpost.com/politics/congress/dem-gop-senators-quietly-seek-background-check-deal-that-could-improve-gun-control-prospects/2013/02/08/5362c63a-71cb-11e2-b3f3-b263d708ca37\_story.html

A cornerstone of President Barack Obama’s drive to check gun violence is gathering bipartisan steam as four senators, including two of the National Rifle Association’s congressional champions, privately seek compromise on requiring far more firearms purchasers to undergo background checks. The talks are being held even as Obama’s call to ban assault weapons and high-capacity ammunition magazines, the two other major pillars of his plan, are hitting rough waters on Capitol Hill. An agreement among the four senators to expand background checks would add significant impetus to that high-profile proposal by getting the endorsement of a group that ranges from one of the Senate’s most liberal Democrats to one of its most conservative Republicans.

#### The plan would be a political motivator for nuclear power development – solves the waste issue.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

Light-water reactors (LWR) of any stripe, however, produce only a tiny fraction of the potential energy in uranium, less than 1%. Fast reactors, in contrast, unlock nearly all of it. The IFR, with its metal-fuel system and pyroprocessing, is able to utilize the actinides to such an extent as to essentially solve the waste problem by reducing the radiological toxicity of the waste products from hundreds of thousands of years to a mere few hundred years. Even if the “million-year problem” of LWR spent fuel is more a political than a technical challenge (given the small volume of the waste stream), nevertheless the issue of public perception of that issue is the one that guides nuclear policy in many countries [14]. As such, the transition to fast reactors and a closed nuclear fuel cycle is both a technical advancement and a political enabler for nuclear power of all kinds.

#### Democrats will use the plan as a bargaining chip to overcome opposition.

Mariah Blake, January/February 2010, is an editor at the Washington Monthly; her work has also appeared in Christian Science Monitor and Foreign Policy, Mother Jones, “The Bailout Goes Nuclear,” <http://www.motherjones.com/environment/2010/01/bailout-nuclear>

Key Senate Democrats have signaled that they are willing to use nuclear subsidies as a bargaining chip to overcome Republican opposition. The Nuclear Energy Institute (NEI), the industry's main lobby, is pushing for at least $100 billion in federal loan guarantees—a dicey proposition given that the Congressional Budget Office has determined that the risk of default would be "well above 50 percent." This raises the question: Will the cost of passing a climate bill be a massive, taxpayer-funded nuclear bailout? The public has rescued the industry once before. The last batch of reactors built in the US during the 1970s and '80s was plagued by a series of boondoggles, one of the most infamous being Long Island's Shoreham Nuclear Power Plant, which took 20 years to build and cost $6 billion—more than 80 times the original estimate—but was never put into commercial operation. Similar debacles pushed utilities into bankruptcy, triggered the largest municipal bond default in US history, and helped cause a sixfold increase in wholesale electricity prices. The total cost to the public, in rate hikes and taxpayer bailouts, was more than $300 billion (in 2006 dollars), according to the Union of Concerned Scientists. Since that time, the industry says it has solved its cost problem, partly by engineering reactors that are simpler and less expensive to build. But the first two next-generation reactors, which are under construction in Finland and France, have been bogged down in multibillion-dollar cost overruns. Meanwhile, the projected cost of building new nuclear plants in the US is soaring: As recently as 2005, the NEI claimed new reactors could be constructed for roughly $2 billion. Newer estimates, including one by Moody's, the credit ratings agency, put the cost as high as $12 billion. That would make nuclear power more expensive on a watt-for-watt basis than most large-scale renewable energy sources, including wind, biomass, and hydropower. No wonder the industry has found it impossible to secure private-sector financing for the 28 reactors that are currently in the pipeline across the nation. Investors "will not accept the economic risk of building new reactors," says Peter Bradford, a former member of the Nuclear Regulatory Commission who is now a professor at Vermont Law School. "There will be no nuclear renaissance beyond what the government is willing to underwrite. "No one understands this better than the industry itself, which is lobbying for a Senate bill to create a Clean Energy Deployment Administration (CEDA) within the Department of Energy (DOE) that would have the authority to award a virtually unlimited number of loan guarantees—without congressional review. "It's a nuclear slush fund," says Michele Boyd, director of Physicians for Social Responsibility's safe energy program, "though the way the bill is written, even many Senate staffers don't know it." The legislation, which is likely to be folded into the climate bill, was sponsored by Sen. Jeff Bingaman (D-N.M.) and crafted with the help of Sen. Lisa Murkowski (R-Alaska). Both lawmakers are top recipients of the nuclear industry's campaign largesse. Under the policy, companies would have to pay an as yet unspecified subsidy fee in order to get loan guarantees, but these payments are all but certain to be dwarfed by the cost of defaults. According to the Union of Concerned Scientists, if 100 new plants are built, as key Republican lawmakers have called for, the price of bad loans could total at least $360 billion—and that's assuming zero cost overruns. The ceda provision builds on the work of Sen. Pete Domenici (R-N.M.), who until his retirement in January 2009 was the Senate's most tireless nuclear crusader. During his reign as chairman of the energy committee from 2003 to 2007, he packed the committee staff with former nuclear-power lobbyists—a clique dubbed "the glow-in-the-dark crew" by some of their Senate colleagues—who shepherded through Congress the Energy Policy Act of 2005. Among other things, the bill provided $13 billion in nuclear subsidies and federal loan guarantees to cover 80 percent of the costs of building low-carbon nuclear technologies, including new reactors. For any other industry, this would have been an enormous victory. But for nuclear, even these generous subsidies weren't enough. In July 2007, six of the nation's largest financial firms—including Citigroup, Lehman Brothers, and Goldman Sachs, companies hardly averse to risky investments—informed the DOE in a letter that nuclear projects would not find financing because they were too chancy. Unless, of course, the agency (which had interpreted the new law to mean 80 percent of project debt) would rewrite the rules so that 100 percent of the debt was covered—foisting almost all of the risk on taxpayers. By the end of 2007, the nuclear lobby had succeeded in getting the DOE to make exactly these changes. But to the industry's dismay, Congress has so far given the DOE authority to distribute $18.5 billion in loan guarantees for nuclear power facilities. That's less than half what UniStar hopes to spend on its four plants, not to mention the needs of the industry at large. So the industry began pushing to increase the funding and simultaneously exempt the program from congressional oversight. Part of NEI's strategy for getting the feds to hand out loan guarantees more freely has been to win over Democrats—who have traditionally been less friendly to nuclear power—by enlisting the help of organized labor. In mid-2008, the group added Michael Mathis and Charles Harple, previously top in-house lobbyists for the International Brotherhood of Teamsters, to its K Street bench. NEI also forged an alliance with the AFL-CIO. At NEI's annual conference in 2008, Mark Ayers, the AFL-CIO's president of Building and Construction Trades, said that in exchange for the industry's commitment to use union labor, his organization would work to "persuade the new majority in Congress about the need for extending and increasing the loan guarantee program." The industry's efforts began to pay off this fall, as nuclear subsidies emerged as the key to wooing Republican votes for a Senate climate bill—votes necessary to offset defections from coal-state Democrats. Since October, Sen. John Kerry (D-Mass.), one of the climate bill's sponsors, has been holding closed-door meetings with Republicans to craft nuclear language. "You listen to the rhetoric around this place and there is no one who will say a disparaging word about nuclear," says a senior Democractic Senate staffer close to the climate bill talks. "They have enough political muscle and enough support across the aisle that I think they will get all the loan guarantees they need."

#### Loan guarantees specifically popular to both sides of the aisle because of lower tax liability.

Sharon Squassoni, November 2009, is a senior associate at the Carnegie Endowment for International Peace in the nonprolifera-tion program. Prior to joining Carnegie, she held various positions in the US government, including at the Congressional research Service, the Arms Control and Disarmament Agency, and the US State Department, is a frequent contributor to journals, magazines and books on nuclear proliferation and defense, The Centre for International Governance Innovation, No. 7, “The US Nuclear Industry: Current Status and Prospects under the Obama Administration,” p. 8, <http://www.carnegieendowment.org/files/Nuclear_Energy_7_0.pdf>

The single most important spur to build new reactors in the United States is loan guarantees. In fact, industry sources indicate they are so critical that new plants may not be built without them. These guarantees are attractive to the US Congress because they offer a way to influence markets and incentivize specific projects, and because they are “scored” as a lower liability for the taxpayer than the actual amount. Thus, a potential US$50 billion in loan guarantees could be scored by the Congressional Budget Office as only costing the taxpayer US$500 million. As originally proposed in the Energy Policy Act (EPACT) of 2005, loan guarantees would only have applied to nuclear power, but this was broadened to apply to a wide range of “innovative energy technologies,” including renewable energy technologies, which further extends their attractiveness within Congress.

#### Nuclear makes it distinct to Congress.

Jim Snyder, 9-14-2012, Bloomberg, “Republican-Led House Passes Bill to Block Energy Loans,” <http://www.bloomberg.com/news/2012-09-14/republican-led-house-passes-bill-to-block-energy-loans.html>

The U.S. House passed legislation to end an energy loan-guarantee program, the culmination of a Republican-led investigation into the collapse of solar-panel maker Solyndra LLC last year. The “No More Solyndras Act,” adopted by a 245-161 vote, wouldn’t immediately halt the loan program. It would prevent the Energy Department from considering applications for government backing submitted since Dec. 31. With $34 billion in loan authority remaining, Democrats said the bill would let nuclear- power projects favored by Republicans go forward.

#### Political capital theory not true, but winners-win is\*\*\*

Michael Hirsh, 2-7-2013, is chief correspondent for National Journal, he also contributes to 2012 Decoded, previously served as the senior editor and national economics correspondent for Newsweek, based in its Washington bureau, was also Newsweek’s Washington web editor and authored a weekly column for Newsweek.com, NationalJournal, “There’s No Such Thing as Political Capital,” <http://www.nationaljournal.com/magazine/there-s-no-such-thing-as-political-capital-20130207>

\*\*\*cites George Edwards, a presidential scholar at Texas A&M University, Richard Bensel, a government professor at Cornell University, and Norman Ornstein of the American Enterprise Institute\*\*\*

On Tuesday, in his State of the Union address, President Obama will do what every president does this time of year. For about 60 minutes, he will lay out a sprawling and ambitious wish list highlighted by gun control and immigration reform, climate change and debt reduction. In response, the pundits will do what they always do this time of year: They will talk about how unrealistic most of the proposals are, discussions often informed by sagacious reckonings of how much “political capital” Obama possesses to push his program through. Most of this talk will have no bearing on what actually happens over the next four years. Consider this: Three months ago, just before the November election, if someone had talked seriously about Obama having enough political capital to oversee passage of both immigration reform and gun-control legislation at the beginning of his second term—even after winning the election by 4 percentage points and 5 million votes (the actual final tally)—this person would have been called crazy and stripped of his pundit’s license. (It doesn’t exist, but it ought to.) In his first term, in a starkly polarized country, the president had been so frustrated by GOP resistance that he finally issued a limited executive order last August permitting immigrants who entered the country illegally as children to work without fear of deportation for at least two years. Obama didn’t dare to even bring up gun control, a Democratic “third rail” that has cost the party elections and that actually might have been even less popular on the right than the president’s health care law. And yet, for reasons that have very little to do with Obama’s personal prestige or popularity—variously put in terms of a “mandate” or “political capital”—chances are fair that both will now happen. What changed? In the case of gun control, of course, it wasn’t the election. It was the horror of the 20 first-graders who were slaughtered in Newtown, Conn., in mid-December. The sickening reality of little girls and boys riddled with bullets from a high-capacity assault weapon seemed to precipitate a sudden tipping point in the national conscience. One thing changed after another. Wayne LaPierre of the National Rifle Association marginalized himself with poorly chosen comments soon after the massacre. The pro-gun lobby, once a phalanx of opposition, began to fissure into reasonables and crazies. Former Rep. Gabrielle Giffords, D-Ariz., who was shot in the head two years ago and is still struggling to speak and walk, started a PAC with her husband to appeal to the moderate middle of gun owners. Then she gave riveting and poignant testimony to the Senate, challenging lawmakers: “Be bold.” As a result, momentum has appeared to build around some kind of a plan to curtail sales of the most dangerous weapons and ammunition and the way people are permitted to buy them. It’s impossible to say now whether such a bill will pass and, if it does, whether it will make anything more than cosmetic changes to gun laws. But one thing is clear: The political tectonics have shifted dramatically in very little time. Whole new possibilities exist now that didn’t a few weeks ago. Meanwhile, the Republican members of the Senate’s so-called Gang of Eight are pushing hard for a new spirit of compromise on immigration reform, a sharp change after an election year in which the GOP standard-bearer declared he would make life so miserable for the 11 million illegal immigrants in the U.S. that they would “self-deport.” But this turnaround has very little to do with Obama’s personal influence—his political mandate, as it were. It has almost entirely to do with just two numbers: 71 and 27. That’s 71 percent for Obama, 27 percent for Mitt Romney, the breakdown of the Hispanic vote in the 2012 presidential election. Obama drove home his advantage by giving a speech on immigration reform on Jan. 29 at a Hispanic-dominated high school in Nevada, a swing state he won by a surprising 8 percentage points in November. But the movement on immigration has mainly come out of the Republican Party’s recent introspection, and the realization by its more thoughtful members, such as Sen. Marco Rubio of Florida and Gov. Bobby Jindal of Louisiana, that without such a shift the party may be facing demographic death in a country where the 2010 census showed, for the first time, that white births have fallen into the minority. It’s got nothing to do with Obama’s political capital or, indeed, Obama at all. The point is not that “political capital” is a meaningless term. Often it is a synonym for “mandate” or “momentum” in the aftermath of a decisive election—and just about every politician ever elected has tried to claim more of a mandate than he actually has. Certainly, Obama can say that because he was elected and Romney wasn’t, he has a better claim on the country’s mood and direction. Many pundits still defend political capital as a useful metaphor at least. “It’s an unquantifiable but meaningful concept,” says Norman Ornstein of the American Enterprise Institute. “You can’t really look at a president and say he’s got 37 ounces of political capital. But the fact is, it’s a concept that matters, if you have popularity and some momentum on your side.” The real problem is that the idea of political capital—or mandates, or momentum—is so poorly defined that presidents and pundits often get it wrong. “Presidents usually over-estimate it,” says George Edwards, a presidential scholar at Texas A&M University. “The best kind of political capital—some sense of an electoral mandate to do something—is very rare. It almost never happens. In 1964, maybe. And to some degree in 1980.” For that reason, political capital is a concept that misleads far more than it enlightens. It is distortionary. It conveys the idea that we know more than we really do about the ever-elusive concept of political power, and it discounts the way unforeseen events can suddenly change everything. Instead, it suggests, erroneously, that a political figure has a concrete amount of political capital to invest, just as someone might have real investment capital—that a particular leader can bank his gains, and the size of his account determines what he can do at any given moment in history. Naturally, any president has practical and electoral limits. Does he have a majority in both chambers of Congress and a cohesive coalition behind him? Obama has neither at present. And unless a surge in the economy—at the moment, still stuck—or some other great victory gives him more momentum, it is inevitable that the closer Obama gets to the 2014 election, the less he will be able to get done. Going into the midterms, Republicans will increasingly avoid any concessions that make him (and the Democrats) stronger. But the abrupt emergence of the immigration and gun-control issues illustrates how suddenly shifts in mood can occur and how political interests can align in new ways just as suddenly. Indeed, the pseudo-concept of political capital masks a larger truth about Washington that is kindergarten simple: You just don’t know what you can do until you try. Or as Ornstein himself once wrote years ago, “Winning wins.” In theory, and in practice, depending on Obama’s handling of any particular issue, even in a polarized time, he could still deliver on a lot of his second-term goals, depending on his skill and the breaks. Unforeseen catalysts can appear, like Newtown. Epiphanies can dawn, such as when many Republican Party leaders suddenly woke up in panic to the huge disparity in the Hispanic vote. Some political scientists who study the elusive calculus of how to pass legislation and run successful presidencies say that political capital is, at best, an empty concept, and that almost nothing in the academic literature successfully quantifies or even defines it. “It can refer to a very abstract thing, like a president’s popularity, but there’s no mechanism there. That makes it kind of useless,” says Richard Bensel, a government professor at Cornell University. Even Ornstein concedes that the calculus is far more complex than the term suggests. Winning on one issue often changes the calculation for the next issue; there is never any known amount of capital. “The idea here is, if an issue comes up where the conventional wisdom is that president is not going to get what he wants, and he gets it, then each time that happens, it changes the calculus of the other actors” Ornstein says. “If they think he’s going to win, they may change positions to get on the winning side. It’s a bandwagon effect.”

## 1AR

### procurement

#### DOD SMR procurement fails, guts successful demonstration, creates massive military resource tradeoff and unique safety/accident risks

King 11

Marcus King, Ph.D., Center for Naval Analyses Project Director and Research Analyst for the Environment and Energy TeamLaVar Huntzinger, Thoi Nguyen, March 2011, Feasibility of Nuclear Power on U.S.Military Installations, www.cna.org/sites/default/files/research/Nuclear Power on Military Installations D0023932 A5.pdf

A significant liability to DoD ownership and operation is having full¶ responsibility for all risks associated with such an undertaking. The¶ risks are made worse by the fact that such an undertaking would¶ require expertise that is outside DoD core capabilities. All aspects ofpreparing for, building, and operating nuclear power plants are bothcomplicated and technically challenging. DoD cannot expect to own¶ and/or operate such a project with satisfactory results without devoting considerable time and resources to developing a competent team.¶ Since the expertise of those involved in such a team would be outside¶ core DoD capabilities, it would be difficult for DoD to maintain a sat-¶ isfactory career path for those personnel. There could be someadvantages to creating shore assignments for Navy personnel thatwould be similar to assignments managing and operating nuclearreactors on ships and submarines. The degree of similarity that wouldbe possible would depend on the type of nuclear power plant built ona DoD installation.The principal advantages of sharing ownership and operation withother government entities is the opportunity to draw on their expertise thus reducing risks and also sharing residual risks appropriately.Shared ownership may require significant effort negotiating with thepartner(s), such as DOE, to ensure DoD interests are properly incorporated in the project. Defining shared objectives and a preferred¶ strategy for accomplishing the objectives could be complicated.

### politics

#### CIR not key to the economy.

Jack Martin, April 2009 Special Projects Director at the Federation for American Immigration Reform Amnesty & the Economy: Myths, Lies & Obfuscation http://www.fairus.org/site/DocServer/amnesty\_economy.pdf

Recognizing that today’s economic conditions and climbing unemployment are a deterrent to any consideration of immigration amnesty legislation, amnesty advocates are trying to persuade the public and Members of Congress that an amnesty for illegal aliens would help the economy. For example, the Immigration Policy Center (IPC) recently issued a report that argues that, “Without comprehensive reform of the immigration system [read amnesty for illegal aliens], our nation cannot experience a full economic recovery.”1 If bold, baseless assertions such as these would win the immigration debate, the debate would be over. This argument spins a fantasyland out of partial and misleading data. Here is how they do it. ECONOMIC RECOVERY REQUIRES AMNESTY FOR ILLEGAL ALIENS? The first assertion of the IPC polemic describes a revenue panacea for the government if an amnesty is enacted. “The 2007 immigration reform bill, which included a legalization program, would have more than paid for itself through increased tax revenue. The CBO and JCT estimated that the Comprehensive Immigration Reform Act of 2007, as amended by the Senate through May 24, 2007, would have generated $48 billion in new revenue during 2008-2017, primarily through Social Security payroll taxes. • The additional revenue would have more than offset the estimated $23 billion in new “direct spending” on refundable income tax credits and Medicaid during 2008-2017. • The extra revenue would have partially offset the $43 billion in new “discretionary spending” on immigration enforcement during 2008-2017.” Read that again. The estimate is that a “legalization” program would cost $23 billion in direct spending and $43 billion in discretionary spending for a total cost of $66 billion and would generate $48 billion in new revenue. So the difference — a deficit of $18 billion — “would have more than paid for itself.” Moral: stating that down is up does not make it so. An analysis by the Center for Budget and Policy Priorities of the same CBO projection noted: “The legislation would increase the unified federal budget deficit by only ‘several billion dollars a year’ by 2027…”2 Although that estimate may understate the net fiscal cost, at least it recognized that it would a revenue loser, not a bonus for the federal government. Aside from the wishful thinking about the impact on the federal budget, the IPC ignores the much greater fiscal impact that amnesty would have at the state and local level. The Federation for American Immigration Reform (FAIR) explained this impact with regard to the earlier CBO estimate of the impact of the 2006 Senate amnesty bill: “An estimate of the fiscal impact at the local level by FAIR identifies a cost of $70 billion per year by 2020, primarily for education and health care. The $70 billion annual price tag does not include a number of other likely cost increases for programs such as assisted housing and other social welfare programs.”3 In addition, because the formal CBO estimate is for the ten-year period after adoption of the legislation, the estimate focuses on the early effects when the newly legalized aliens currently are precluded by law from using federal welfare programs.Therefore, it does not include the delayed impact. The CBO acknowledged this issue in its report. “This [the increase in the budget deficit] would happen because, the net cost of the legislation would grow after 2017, as more of the affected immigrants became eligible for benefits and the per capita cost of benefits rose…”4

#### Military doesn’t shield – wrong committees gut understanding

Sarah Erwin, Editor of National Defense Magazine, 11 [“Defense Energy: Small, Incremental Steps Do Better Than Sweeping Reforms,” National Defense Magazine, September, http://www.nationaldefensemagazine.org/archive/2011/September/Pages/DefenseEnergySmall,IncrementalStepsDoBetterThanSweepingReforms.aspx]

The military’s energy goals are unlikely to be met until the United States adopts policies that recognize energy as a “national strategic need,” said retired Navy Adm. John Nathman, former vice chief of naval operations. “We need policy and legislation,” he said. The military services “have a lot of smart people working this problem,” but their efforts would be more wisely used if they were supporting a larger American goal to become less dependent on oil.¶ Private sector leaders also are cautiously pessimistic. “Industry is waiting to figure out whether this [alternative fuels] is a hobby or a reality for the DoD. … Only time will tell on that,” said David Morrison, a former senior House staff member and currently vice president for government operations at The Boeing Co. “We have to see if there is institutional and resource commitments,” he said.¶ Congress today has no appetite for big-energy policies, and despite widespread support for most military programs, legislators don’t put energy efficiency at the top of their list, said Morrison. “Congressional committees look at the DoD strategy and say, ‘Huh?’” Morrison said at a Center for Strategic and International Studies forum.¶ On Capitol Hill, defense officials face an audience that only has a “superficial understanding of the issues,” Morrison said.

#### Military uniquely taints the reactor.

Erwin ’12 (Sandra Erwin, National Defense Magazine, “Ranking HASC Dem: Political Environment ‘Difficult’ for DoD Energy Agenda”, http://www.nationaldefensemagazine.org/blog/Lists/Posts/Post.aspx?ID=797, May 22, 2012, LEQ)

For the second year in the row, the House GOP majority is seeking to curtail Pentagon investments in alternative sources of fuel. Republicans’ effort failed last year, but there is a strong chance that fossil fuel supporters might win this time, unless a more forceful argument is made in favor of clean-burning, renewable energy, said House Armed Services Committee Ranking Member Rep. Adam Smith, D-Wash. “We have to fundamentally start to win the argument for why alternative energy matters,” Smith said May 22 in a conference call with reporters. “The political environment is difficult” for green energy, Smith said. Provisions passed by the House in the fiscal year 2013 National Defense Authorization Act (H.R. 4310) severely limit the Pentagon’s authority to purchase alternative fuels that cost more than fossil fuels. One amendment would exempt the Pentagon from legislation — passed in fiscal year 2007 under the Bush administration — that requires federal agencies buy only alternatives that are less polluting than fossil fuels. Another provision would include so-called clean coal and tar sands fuel as acceptable alternatives to petroleum. Smith said the GOP position on DoD energy programs has hardened over the past several years, although he is still hopeful that the amendments in H.R. 4310 will be stripped when the bill is taken up by a House-Senate conference committee. That is what happened a year ago, Smith said. “I was able to persuade [HASC Chairman Rep.] Buck McKeon, [and Senate Armed Services members] John McCain and Carl Levin that this was a significant policy shift and we shouldn’t just throw it in the conference report.” Smith said it took a large group of lawmakers to make this argument. “We needed many voices to say this is bad,” Smith said. It’s hard to predict if a similar strategy will work this time, he added. Renewable energy has suffered significant political setbacks in the past several years, he said. “We just have not convinced enough people about the need to start burning clean burning sources of energy.” Too many Americans, he said, have bought the GOP argument that unless the United States starts drilling “every square inch for oil, gas prices will go up.” The Pentagons’ biofuels program is costly, Smith acknowledged, but it should be seen as a long-term strategic investment so that clean alternatives to oil are available one day. McKeon and other HASC Republicans have been adamant that Navy spending on biofuels is an unaffordable luxury as it drains funds from ship construction programs and naval readiness accounts. Some of the lawmakers who have opposed Navy biofuel efforts come from shipbuilding districts. Smith agreed that members’ unhappiness with the Navy’s ship procurement budgets has become a lightning rod. But the energy standoff is more than just about ships, he said. “The GOP majority simply doesn’t buy into alternative energy policy as a philosophy,” he said. “They’re very pro fossil fuel. Promoting alternative fuel to them doesn’t make sense.” Adding more ships to the budget wouldn’t change that, he noted, although that is not an option that is being contemplated. “Ships are expensive,” Smith said. “It don’t know that we’re in a position to cut that deal.” If the goal were to find more money for ships, there is plenty of fat in the defense bill to do that, Smith said. H.R. 4310 is adding costly demands on the Pentagon to expand missile defense sites, for instance, he said. “They can find savings elsewhere to build ships.” At this stage in the game, the Pentagon’s energy agenda only can be saved by stronger advocacy of what it means for the larger national energy future, Smith said. “We’re simply trying to raise awareness that we need to reverse these amendments in the Senate and then in conference.” A particularly tough hurdle will be to convince members to back away from including coal and tar sands as part of the alternative fuels mix, said Smith. Even “clean” coal has not been proven to reduce greenhouse gas emissions, and tar sands do not make clean-burning fuel, he contended. Deliberations are likely to get ugly because they have to do with the contentious issue of climate change. “The Defense Department has said climate change is a national security issue,” said Smith. If the Pentagon has to choose between petroleum and other non-clean burning sources of fuel, that also undermines its agenda, he said.

# Northwestern round 8

### prolif

#### No fast reactor proliferation risk – mixed processing stream and safeguarded facilities.

Barry Brook et. al, 2-21-2009, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, George S. Stanford is a nuclear reactor physicist, part of the team that developed the Integral Fast Reactor, PhD from Stanford University in Physics, Masters from University of Virginia in Engineering, worked at Argonne National Laboratory, Graham R.L. Cowan, "Boron: A Better Energy Carrier than Hydrogen?" in 2001, published "How Fire Can Be Tamed," BraveNewClimate, “Response to an Integral Fast Reactor (IFR) critique,” <http://bravenewclimate.com/2009/02/21/response-to-an-integral-fast-reactor-ifr-critique/>

[In point of fact, anyone hoping to make a bomb from plutonium will likely try to obtain an isotopically more pure plutonium by creating it from U-238 (depleted uranium) at a small research reactor. To a great extent the proliferation threat of power reactors is overblown in light of this, but nevertheless proliferation resistance should always be a priority whenever fissile material is in circulation. Green’s warning about IFRs being more dangerous in this regard is incorrect, since LWRs produce plutonium as well, and it’s in their spent fuel. Either way you need a PUREX process to extract the (isotopically inferior) plutonium. This whole issue is one of the most common misconceptions about the IFR system, and one of many under which Mr. Green is laboring. I discuss at length in Prescription for the Planet how and where IFRs would be deployed in order to minimize proliferation risks. As for breeding high-quality (I assume Green means weapons-grade) plutonium, virtually any reactor (including research reactors) can do that by wrapping a U-238 blanket around the core and letting it get bombarded with neutrons for a while, then removing it and extracting the Pu with the PUREX method. It requires relatively brief exposure, which is NOT what one would have in a reactor core operated for power purposes. Again, as I’ve pointed out here and in my book, fissile material should all be subject to rigorous international oversight. In P4TP I deal with just how to do that in some detail. [GS] If their IFR plants were safeguarded, the material in the processing stream would be highly undesirable and their chances of diverting it undetected would be slim indeed. If not safeguarded, they could do what they could do with any other reactor — operate it on a special cycle to produce good quality weapons material. But in either case, most likely they would do what everyone else has done: construct a special production facility. Detecting such a clandestine facility is probably the main, immediate challenge facing international safeguards, and has nothing to do with whether a country has IFRs or LWRs.

#### No proliferation risks from fast reactors – no breeding of plutonium.

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If you deploy IFRs in countries first in nuclear club countries — those that already possess, or are capable of making, nuclear weapons, then there is no additional proliferation risk. These countries already have a nuclear arsenal sufficient to wipe out humanity a few hundred times over. Building new IFR plants cannot meaningfully heighten this risk unless they are constructed in countries with no such capability. If this is done, it would require strong international oversight, as has been discussed elsewhere. Indeed, I’d argue that in consuming existing weapons-grade plutonium, the net effect of more IFRs is to lessen the overall risk of nuclear explosions. But even without an international oversight organisions, we can reduce >95% of global greenhouse gas emissions by: (a) replacing electricity and transport energy with electricity from zero-carbon sources like IFR, deployed only in nuclear club countries, (b) halting deforestation in all countries (nuclear club and other), (c) massively scaling back agricultural emissions from fuel and ruminant/fertilizer sources, (d) providing non-nuclear-club countries with nuclear batteries, power via cross-border transmission lines, and boron or other metal fuels for vehicles, from IFR countries, (e) resolve the municipal solid waste problem in all countries via plasma burners. [GLRC] One can reduce the theoretical potential for power reactors to be involved in proliferation, but their actual history of involvement is zero, and so not subject to reduction. This potential remain like that of car engines to be made into multibarrel cannons: it could happen, and guns do proliferate, but never that way. [TB] Pray tell, what is the problem with McFarlane’s statement: “The reactor … could be used for excess plutonium consumption or as a breeder if needed …” The fact that it can be used as a breeder is precisely why it would allow us to stop uranium mining, and the fact that it consumes excess plutonium is exactly what we want to do: get rid of separated plutonium and not separate it anymore. [GS] A breeder is a reactor that is configured so as to produce more fissile material than it consumes. A fast reactor can be designed and operated to be either a net breeder or a net burner. A thermal reactor is a net burner of nuclear fuel, but – and this is very important – all thermal reactors are prolific breeders of plutonium. People often insist on calling IFRs breeders (originally, fast reactors were investigated because of their potential to breed), partly because of genuine confusion, and partly for the emotional impact, since “breeder” carries the subliminal connotation of runaway plutonium production. The central fact that those people are missing is that with IFRs you can choose not to breed plutonium, whereas with thermal reactors you make plutonium whether you want it or not.

### spent fuel

#### PRISM is safe – no corrosion and or fission fragments.

Barry Brook et. al, 2-21-2009, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, George S. Stanford is a nuclear reactor physicist, part of the team that developed the Integral Fast Reactor, PhD from Stanford University in Physics, Masters from University of Virginia in Engineering, worked at Argonne National Laboratory, Graham R.L. Cowan, "Boron: A Better Energy Carrier than Hydrogen?" in 2001, published "How Fire Can Be Tamed," BraveNewClimate, “Response to an Integral Fast Reactor (IFR) critique,” <http://bravenewclimate.com/2009/02/21/response-to-an-integral-fast-reactor-ifr-critique/>

[BWB] A 1 GW IFR power station would produced about 1 tonne of fission products a year. For comparison, a 1 GW coal-fired power station produces over 1 million tonnes. Plutonium (and other actinides) are indeed recycled in pyroprocessing, but Pu is never purified in an IFR, and would never leave the plant facility. Only the vitrified fission products would, which of course cannot be used in any nuclear explosive. From the FAQ: “Discussions on waste, nearly unlimited fuel supply, transportation, and a nearly diversion-proof fuel all hinge on the fuel type and the fuel reprocessing scheme. To describe the waste advantages, fuel reprocessing will first be described. Reprocessing of fuel is a key requirement of the IFR. However, IFR reprocessing is very different from processes which have been proposed or which are in use in other countries. Basically, reprocessing IFR fuel consists of two simple steps: 1. fission fragments are removed from the fuel, and 2. unused fuel is recovered, along with the transuranic elements (sometimes called actinides). Normally, the transuranic elements would go to the waste stream with the fission products, but in the IFR, they are kept with the fuel and sent back to the reactor to also serve as fuel. In the above description, note that the waste stream consists of only the fission products. The result is that instead of a waste that remains radioactive for many thousands of years, as would be the case if the transuranic elements were present, the radioactivity in the waste will decay to a value less than that of the original uranium ore in about 200 years. An additional advantage to the waste side of the IFR operation is that the IFR plant produces less low-level waste than today’s nuclear plants. The sodium coolant used in the IFR does not corrode the piping or structure, and, as a result, there are no radioactive corrosion products to remove from the primary system and send to a low-level radioactive waste repository. The fission product waste from an IFR type plant will amount to about 1700 pounds of waste per year for a plant of about 1000 megawatts electric output. This is in contrast to the waste from an equivalent coal plant of about 1,275,000 tons per year. These figures are for a plant that operates about 70 percent of the year.“

#### No risk of accidents – chemical benefits and engineering experience.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

One of the issues most often mentioned when discussing sodium-cooled fast reactors—by far the type with the most reactor-years of experience worldwide—is the chemical reactivity of sodium, which burns upon contact with air (though with a very cool flame) and reacts quite dramatically upon contact with water. Yet sodium has several compelling advantages in fast-reactor operation: superior heat-exchange properties, virtually no corrosive effect on reactor components even after decades of operation, short half-life of sodium isotopes that form in the reactor vessel, etc. (see previous section). Some advocates of other systems characterize sodium’s volatility as a deal-breaker. But the intermediate loop that transfers heat from the reactor vessel to the steam generator contains only non-radioactive sodium, with the steam generator isolated in a separate structure, assuring that in the highly unlikely event of a sodium-water reaction there will be no danger to the primary system and no chance of radioactive material being involved. This design means that the unfairly characterized sodium problem is nothing more than an engineering design issue, involving a common element that has been used in industrial processes for well over a century.

### 2AC SK 123 agreement (ENR bad)

#### No impact to South Korean proliferation from reprocessing.

Scott A. Snyder, 11-9-2012, is a project manager for the Partnership for Nuclear Security at CRDF Global, council on foreign relations, <http://blogs.cfr.org/asia/2012/11/09/counterproliferation-and-global-korea/>

On export controls, the ROK is an example of a state that has worked to prevent proliferation by developing a robust set of export controls, while not slowing its export driven economy. As recently as 2005, a poll by the Korea International Trade Association found that, while most Koreans supported the idea of export controls, two-thirds of export companies did not understand the export control system. Eleven percent had “never heard of the export control system” at all. Less than 40 percent of these firms regularly secured authorization from the government before they exported materials abroad or checked to see if their exports were prohibited. The ROK has worked to address these issues by creating training on export controls, enforcing the law more rigorously, and installing an effective online system for businesses to consult export control guidelines and apply for licenses. Having made these changes in the recent past, and having good relations with its neighbors in East Asia, South Korea can provide training programs on export controls to other states in East Asia. As a nuclear technology exporter, Seoul has an opportunity to establish nuclear standards that can support nonproliferation efforts globally. As it works to export nuclear technology, South Korea can also provide training to ensure that there is an effective security culture at plants and facilities, and that those facilities are effectively audited. South Korea could also work with the nuclear suppliers groups to restrict the transfer of enrichment and reprocessing technology, and require adoption of the IAEA Additional Protocol for all states to which it supplies nuclear technology.

#### South Korea will look for a way to recycle inevitably – U.S. pyro-processing would alleviate these risks.

Choe Sang-Hun, 7-13-2010, staff writer, The New York Times, “U.S. Wary of South Korea’s Plan to Reuse Nuclear Fuel,” <http://www.nytimes.com/2010/07/14/world/asia/14seoul.html>

 “The Americans say no to recycling, but don’t offer an alternative,” said Lee Un-chul, a nuclear scientist at Seoul National University. “They think we might change our minds and build nuclear weapons, depending on the situation with North Korea. In short, they don’t trust us. This is frustrating. We have to fight.” That tug of war begins later this year when the two allies start renegotiating their nuclear treaty, which expires in 2014. South Korea is the site of the next nuclear security summit meeting, in 2012. Analysts here say that any new deal that would permit Washington to continue blocking South Korea from recycling its fuel — even though it has agreed to let India, which is not even a member of the Nuclear Nonproliferation Treaty, do so — would hurt the national pride of the South Koreans, who have been loyal allies. According to local news reports, the South Korean government also wants to acquire a uranium enrichment capacity to make the traditional fuel for reactors — another activity banned by the 1974 accord because enriched uranium can also be used for weapons. South Korea’s ambition is tied to its drive to become a major exporter of nuclear reactors. In December, it won a $20 billion contract to build four nuclear plants in the United Arab Emirates. Possible options, according to analysts in the United States and South Korea, include sending South Korea’s spent nuclear fuel to another country, for instance to France, for reprocessing, or constructing a recycling plant in South Korea and placing it under multinational control for security. “It’s really our responsibility to work cooperatively with other governments to find ways that the benefits of the peaceful use of nuclear power can be obtained without leading to dangerous fuel-cycle activities proliferating,” said Daniel B. Poneman, the United States deputy secretary of energy, in Seoul last month. South Korean engineers are championing a new technology called pyroprocessing, which the Bush administration endorsed. They call it “proliferation-resistant” because the plutonium produced through pyroprocessing is not pure and cannot be used directly for nuclear weapons.

#### The plan can serve as a separate test case for the alliance instead – cooperation without approval.

Seongho Sheen, June 2011, is an assistant professor at the Graduate School of International Studies, Seoul National University, previously, he was an assistant research professor at Asia-Pacific Center for Security Studies (APCSS), Honolulu, Hawaii, and a research fellow at Institute for Foreign Policy Analysis (IFPA), Cambridge, United States, The Korean Journal of Defense Analysis, Vol. 23 No. 2, “Nuclear Sovereignty versus Nuclear Security: Renewing the ROK-U.S. Atomic Energy Agreement,” p. 12, <http://www.brookings.edu/~/media/Files/rc/papers/2011/08_nuclear_korea_sheen/08_nuclear_korea_sheen.pdf>

In addition, Korean scientists have collaborated with both IAEA and Los Alamos National Laboratory scientists on safeguards for pyroprocessing since 2002. ROK-U.S. joint-research on pyroprocessing and its safeguards would address Seoul’s aspirations to become a leader in next-generation nuclear technology, without giving South Korea long-term consent for outright reprocessing of its own. In an interview with the Korean media, the American ambassador to Seoul, Kathleen Stevens, said that the United States and South Korea could find a solution to take into consideration both South Korea’s reprocessing aspirations and international concerns over nuclear non-proliferation.44 After the first official meeting between delegations from both sides, the two governments announced that they had discussed a proposed joint study on nuclear power reactor spent fuel disposition options, including pyroprocessing.45

#### South Korea will reprocess anyway

Chad O’Carroll, 11-8-2012, “U.S.-Korea Relations after Obama’s Reelection,” Korea Economic Institute, <http://blog.keia.org/2012/11/u-s-korea-relations-after-obamas-reelection/>

An additional hurdle that could set back U.S. – Korea relations relates to Seoul’s domestic nuclear power infrastructure. The current U.S.-ROK nuclear energy agreement is due to expire in March 2014 and South Korea is now increasingly eager to make use of the spent fuel from its nuclear reactors. Having outlined a goal of processing the spent fuel through a capability known as pyroprocessing, South Korea hopes to potentially recycle fuel by using the transuranic elements in fast reactors. As the world’s sixth biggest exporter of nuclear power plants, South Korea has an understandable desire to close the nuclear fuel cycle – doing so will put it in an even better position to offer full range of nuclear services worldwide and attract additional contracts. However, if the ROK were to be allowed to develop a reprocessing facility there would be consequences for global non-proliferation regime and implications for the dismantling of the DPRK nuclear program. As such, it is a delicate issue that will require thoughtful diplomacy to resolve.

#### Obama reversing stand now.

Rajaram Panda, 11-11- 2012, Obama-II and the Korean Peninsula: The Road Ahead – Analysis, Eurasia Review, http://www.eurasiareview.com/11112012-obama-ii-and-the-korean-peninsula-the-road-ahead-analysis/

Handling the issue of a bilateral civilian nuclear energy cooperation pact that is set to expire in early 2014 is another tricky one. Seoul is seeking more non-military nuclear activities, including the enrichment of uranium and reprocessing of spent fuel rods. According to Bruce Klinger at the Heritage Foundation, if Obama in his second term will be “willing to make adjustments in his non-proliferation policies to accommodate Korean interests, or whether UN non-proliferation interests ultimately serve as constraints that will limit the development of South Korea’s nuclear program” remains to be seen. With no burden of re-election, Obama is expected to be more active on the Korean peninsula policy.

#### Further funding is key to IFNEC prevents incentives to abandon peaceful nuclear.

Jeff Johnson, 6-28-2007, senior correspondent Chemical and engineering news, “Reprocessing Key to Nuclear Plan Nuclear waste impasse drives DOE to push for reprocessing spent fuel despite costs, technological hurdles,” <http://pubs.acs.org/cen/government/85/8525gov1.html>

For GNEP to work, the Energy Department must ramp up R&D to settle on a technology to reprocess spent fuel, build a plant to reprocess the spent fuel into uranium and plutonium and other elements, and develop and build "fast neutron" reactors to burn the plutonium as fuel and generate electricity. DOE also plans to take its reprocessing system to the world, selling reactor fuel to other countries and taking back their spent fuel for further reprocessing. GNEP has the far-reaching goal of encouraging nuclear energy development throughout the world. The U.S. would lead a consortium of countries that already have reprocessing programs, providing nuclear fuel services to countries that lack that capability. In return for being allowed to buy fresh fuel and return spent fuel for reprocessing, these countries would agree not to build uranium enrichment facilities or spent-fuel reprocessing plants. By providing and retrieving this ready-to-use nuclear fuel, DOE hopes to discourage other nations, like Iran, from developing their own technologies that could produce weapons-grade nuclear material—either by obtaining plutonium through reprocessing of spent fuel or using cascades of centrifuges to enrich uranium beyond the 5% U-235 required for power generation to the higher levels needed to build a modern weapon.

#### Without the plan and a de facto re-arrangement of the 2014 agreement the ROK alliance will collapse and it will empower nationalists causing peninsula nuclearization.

Seongho Sheen, June 2011, assistant professor at Seoul National University, was an assistant research professor at Asia-Pacific Center for Security Studies (APCSS), Honolulu, Hawaii, and a research fellow at Institute for Foreign Policy Analysis (IFPA), “Nuclear Sovereignty versus Nuclear Security: Renewing the ROK-U.S. Atomic Energy Agreement,” The Korean Journal of Defense Analysis Vol. 23 No. 2, p. 273–88, <http://www.brookings.edu/research/papers/2011/08/nuclear-korea-sheen>

The most important challenge for Washington and Seoul is to prevent the issue from becoming a test-case for the alliance. During their summit meeting in June 2009, President Obama and President Lee promised close cooperation regarding the peace-282 Seongho Sheen Nuclear Sovereignty versus Nuclear Security 283ful use of nuclear energy, among others.35 Yet, any hint of U.S. objections to South Korea’s demand for “peaceful” nuclear sovereignty could send the current amicable alliance relationship into turmoil, as shown during the fierce anti-American rallies in Seoul over the U.S. beef import issue in 2008. Many South Koreans often compare the ROK-U.S. revision of the atomic agreement with the U.S.-Japan revision in the1980s. In its renegotiation in the late 1980s of its nuclear agreement with the United States, Japan acquired an advanced agreement on full-scale spent fuel reprocessing and uranium enrichment. Japan has become the only non-nuclear weapons state with a full reprocessing capability.36 Washington believed that Japan posed no proliferation risk given its excellent nonproliferation credentials; however, many in South Korea think that they deserve the same right. Washington seems to have difficulty in giving the same benefit of doubt to South Korea when it comes to sensitive nuclear technology. They may say South Korea is different from Japan, which already had reprocessing and enrichment plants under the existing agreement that was agreed to before North Korea’s nuclear program was revealed. Yet, it will be difficult for the United States to simply ignore South Korea’s demand and its growing nuclear capacity because South Korea, along with Japan, is one of the most important U.S. allies in Asia. It will be a challenge for the United States to balance its bilateral alliance management with Seoul and its commitment to global nonproliferation efforts. An editorial in the Chosun Ilbo, a prominent Korean newspaper, warned the ROK-U.S. alliance could, “come under strain if Washington stubbornly insists on blocking South Korea from reprocessing.”37 For many Koreans the negotiation could be another test case for the U.S. commitment to the alliance after the very controversial KORUS FTA negotiations. The U.S. attitude could be regarded as another referendum on America’s sincerity and respect for South Korea’s status as a key ally. The comparison with Japan would provide a compelling case for both critics and supporters of the alliance in Korea. In addition, the 2008Bush administration’s decision to award another long-term consent to India for reprocessing nuclear waste will make it more difficult for U.S. negotiators to persuade Seoul to forgo the same right.38 How minor they might be, some strong nationalists may even argue for the need for South Korea to have its own nuclear weapons program. Recently, Kim Dae-Joong, a prominent Korean conservative journalist called for a South Korean nuclear weapons program.39 In addition, some members of the National Assembly argued for having a “conditional” nuclear option until the complete resolution of North Korea’s nuclear issue.40

#### Alliance strength key to deterring conflict with North Korea.

Michael McDevitt, February 2011, vice president and director of the CNA Strategic Studies, “Deterring North Korean Provocations,” Brookings Institution, http://www.brookings.edu/research/papers/2011/02/north-korea-mcdevitt

Since the Armistice that ended the fighting in Korea in 1953, the U.S.-ROK alliance has been successful in preventing another North Korean invasion. The basic approach has been to present such a formidable defensive posture that the North would never believe it had an opportunity to forcefully reunify the country under its leadership. In other words, North Korea has successfully been deterred. Alliance strategy has worked so well that today the prospect of an attempt by North Korea to militarily reunite the peninsula is judged by many to be incredible. Setting aside the question of whether Pyongyang still has the desire to solve the Korean civil war by force of arms, some argue that North Korea no longer has the capability to invade successfully, even if it wanted to. Still, both the U.S. and ROK armed forces take the possibility of another invasion, however remote, seriously. The alliance’s Combined Forces Command (CFC) worries about the possibility of a surprise, or short warning attack, because North Korea has positioned much of its Korean People’s Army (KPA) close to the DMZ where it could undertake offensive operations in short order. Deterrence as Practiced Today in Korea “Broadly defined, deterrence is the threat of force intended to convince a potential aggressor not to undertake a particular action because the costs will be unacceptable or the probability of success extremely low.”[1] In other words, deterrence comes in two forms—deterrence by punishment and deterrence by denial. In the first instance, potential aggressors are deterred by the prospect of having to endure unacceptable punishment in response to an aggressive act. In the second case, deterrence by denial, the potential aggressor is deterred because defenses are so good that the aggressor concludes that it could not achieve its political and military objectives through use of force. In Korea, the U.S.-ROK alliance combines both of these approaches—a strong defense that can deny success, buttressed with the promise of overwhelming retaliation in the event of an invasion from the north. For either of these forms of deterrence to be successful what is threatened in response to aggression or a hostile act must be believable, or as it is commonly cast, must be credible. Credibility in turn, derives from a combination of military capability and a belief in the minds of North Korean leaders that the alliance has the political will to act. There is no doubt that the U.S.-ROK allies have the political will to respond to an invasion; hence the conditions necessary for a credible deterrent, capability and political will, are met.

### 2AC ice age DA

#### Ice-age is a myth – no need to increase warming.

Thomas C. Peterson et. al, September 2008, is a research meteorologist at NOAA's National Climatic Data Center in Asheville, NC. He is a lead author on the IPCC Fourth Assessment Report, a member of the GCOS Atmospheric Observation Panel for Climate, lead author on CCSP Product, William M. Connolley is a Senior Scientific Officer in the Physical Sciences Division in the Antarctic Climate and the Earth System project at the British Antarctic Survey, where he worked as a climate modeler, and John Fleck writes about science for the Albuquerque Journal, American Meterological Society (AMS), “The Myth of The 1970s Global Cooling Scientific Consensus,” <http://journals.ametsoc.org/doi/pdf/10.1175/2008BAMS2370.1>

There was no scientific consensus in the 1970s that the Earth was headed into an imminent ice age. Indeed, the possibility of anthropogenic warming dominated the peer-reviewed literature even then. When climate researcher Reid Bryson stood before the members of the American Association for the Advancement of Science in December 1972, his description of the state of scientists ‘understanding of climate change sounded very much like the old story about the group of blind men trying to describe an elephant. The integrated enterprise of climate science as we know it today was in its infancy, with different groups of scientists feeling blindly around their piece of the lumbering climate beast. Rigorous measurements of increasing atmospheric carbon dioxide were available for the first time, along with modeling results suggesting that global warming would be a clear consequence. Meanwhile, newly created global temperature series showed cooling since the 1940s, and other scientists were looking to aerosols to explain the change. The mystery of waxing and waning ice ages had long entranced geologists, and a cohesive explanation in terms of orbital solar forcing was beginning to emerge. Underlying this discussion was a realization that climate could change on time scales with the poten-tial for significant effects on human societies, and that human activities could trigger such changes (Bryson 1974). Bryson laid out the following four questions that still stand today as being central to the climate science enterprise: i) How large must a climate change be to be important? ii) How fast can the climate change? iii) What are the causal parameters, and why do they change? iv) How sensitive is the climate to small changes in the causal parameters? Despite active efforts to answer these questions, the following pervasive myth arose: there was a consensus among climate scientists of the 1970s that either global cooling or a full-f ledged ice age was imminent (see the “Perpetuating the myth” sidebar). A review of the climate science literature from 1965 to 1979 shows this myth to be false. The myth’s basis lies in a selective misreading of the texts both by some members of the media at the time and by some observers today. In fact, emphasis on greenhouse warming dominated the scientific literature even then. The research enterprise that grew in response to the questions articulated by Bryson and others, while considering the forces responsible for cooling, quickly converged on the view that greenhouse warming was likely to dominate on time scales that would be significant to human societies (Charney et al. 1979). However, perhaps more important than demonstrating that the global cooling myth is wrong, this review shows the remarkable way in which the individual threads of climate science of the time— each group of researchers pursuing their own set of questions—was quickly woven into the integrated tapestry that created the basis for climate science as we know it today.

#### Anthropogenic GHG emissions are not the driving factor – we have comparative evidence.

W.R. Peltier & Guido Vettoretti, 7-29-2011, Ph. D. in Physics from the University of Toronto, Director of the Centre for Global Change Science, PI of the Polar Climate Stability Network, Department of Physics at the University of Toronto, Dr. Guido Vettoretti, Research Associate in the Department of Physics at the University of Toronto, “The impact of insolation, greenhouse gas forcing and ocean circulation changes on glacial inception,” [http://hol.sagepub.com.proxy.lib.umich.edu/content/21/5/803.full.pdf+html](http://hol.sagepub.com.proxy.lib.umich.edu/content/21/5/803.full.pdf%2Bhtml)

We have focused on a set of experiments, using a coupled atmosphere–ocean model of moderate resolution, to investigate the impact of both changes in GHG concentrations and insolation changes in order to better understand the influence that these boundary condition changes have on high latitude perennial snow cover in the model. The importance of internal decadal variability in the simulations was also addressed by examining the correlation between changes in the AMOC and changes in surface temperature and snow cover at high northern latitudes in each of the experiments. The purpose of this study was to address a number of long-standing issues regarding the relative role that GHG concentrations play as a determining factor in the growth of ice sheets in the Arctic under reduced northern summertime insolation conditions. The early anthropogenic hypothesis proposed by Ruddiman (2003) is predicated upon the notion that human modifications of the environment in the early to late Holocene may have contributed to the arrest of what would have otherwise been the onset of the next glacial cycle by increasing GHG concentrations in the atmosphere and thus warming the planet. The excellent records of GHG concentrations from Antarctica, along with detailed calculations of insolation throughout the second half of the Quaternary allow us to draw analogues between the modern interglacial and the set of interglacials that have occurred in the past 800 000 years. MIS 11 and the modern interglacial, often used as analogues for one another, have a number of significant differences in orbital signature that make comparisons difficult. In particular, eccentricity-precession and obliquity are out of phase just after Termination five (MIS 11) and are in phase just after the last glacial termination that leads into the Holocene. We find that this basis of comparison is rather inconclusive as a means of addressing arguments for or against the early anthropogenic hypothesis. Instead we focus on a series of modelling studies with strong and weak insolation forcing and low and high GHG concentrations and including the internal variability characteristic of a coupled model. The evolution of the AMOC is correlated with global and regional temperatures in the coupled model that we employ. Equilibrating the climate requires hundreds of simulation years to obtain a stable climate, that we have shown is characterized by large fluctuations in regional high latitude temperatures which correlate well with the AMOC maximum. The statistically equilibrated climate is also subject to a number of anomalies with respect to the modern observed climate. In particular, there are high latitude cold biases and anomalously high amounts of snow coverage in Northern Hemisphere summer. These biases are shown to manifest themselves in each of the glacial inception experiments presented in this study. In particular we find too much snow accumulation in the regions of northwestern North America and eastern Siberia. While we have not directly addressed the cause for this excessive snow accumulation, the errors in the sea-ice simulated in the CCSM3 (Holland et al., 2006) are a possible cause for this anomalous permanent snow cover. The land surface snow cover parameterization in the model also has a number of deficiencies in the physical simulation of permanent snow cover that includes limits on snow accumulation. The set of six glacial inception simulations demonstrate that the impact of the 116 ka BP insolation regime is the strongest factor in determining the extent of perennial snow cover. The level of GHG concentrations (CO2 between 240 and 260 ppmv) plays a secondary role in determining the extent of snow cover in both the pre-industrial era and at 116 ka BP. The changes in snowfall rate in the Arctic were shown to be highly correlated with surface temperature in these regions. The significant changes in snowfall rate were influenced to first order by insolation changes rather than the atmospheric GHG concentration. The decadal variability in Arctic summer surface temperature and snowfall appear to be correlated with AMOC strength but a regression analysis between these variables does not provide strong evidence for a relationship between AMOC strength and perennial snow cover changes. The AMOC strength appears relatively constant (to within 2–3 Sv) between the 116 ka BP experiments and the pre-industrial experiments. We are nevertheless unable to rule out the possibility that changes in internal variability of the climate system may play a significant role in the glacial inception process as longer and more detailed studies may be required (e.g. the melt back of Greenland during the end of the Eemian, when surface temperatures were 1–2°C warmer than present (Kaspar et al., 2005)). The magnitude of the impact that early anthropogenic activity had on climate will require further analyses. This study, while not directly addressing the validity of the early anthropogenic hypothesis, investigated the component of the hypothesis that suggested that early anthropogenic carbon emissions would have resulted in the suppression of the start of the next ice age well before the onset of the industrial revolution. The results of our analysis, which illustrate the impact of reductions in GHGs during the pre-industrial period (CO2 from 240 to 280 ppmv), do not display any significant glacial inception in the Canadian Arctic Archipelago. This is contrary to the idea that changes in Holocene GHG concentrations of the magnitude suggested by Ruddiman (2007) would have been sufficient to eliminate the onset of perennial snow cover that would otherwise have occurred in the Holocene in the absence of anthropogenic forcing. Our analyses also suggest that insolation forcing is by far the most significant driver of the glacial inception process with GHG concentration playing a secondary role. Using an additional set of two simulations of the future (10 ka AP and 51 ka AP), we propose that the closest modern analogue for conditions favourable to glacial inception is less than 10 000 years into the future when Earth’s obliquity achieves a local minimum and insolation is reduced in Northern Hemisphere late summer and fall at high latitudes. Our simulations, using mean interglacial GHG levels, indicate that the current interglacial will last for at most approximately 20 000 years. It will be interesting in future work to investigate the level of GHG concentrations that would have to be reached following injection of the CO2 spike that humankind is currently adding to the system in order that a further glacial cycle may occur.

#### No China-Russia war.

Anatoly Karlin, 10-17-2010, Sublime Oblivion, http://www.sublimeoblivion.com/2010/10/17/russia-china-no-war/

Every so often there appear claims, not only in the Western press but the Russian one, that (rising but overpopulated) China is destined to fight an (ailing and creaking) Russia for possession of its resources in the Far East\*. For reasons that should be obvious, this is almost completely implausible for the next few decades. But let’s spell them out nonetheless. 1. China regards India, Japan, and above all the USA as its prime potential enemies. This is tied in to its three geopolitical goals: (1) keep the country together and under CCP hegemony – an enterprise most threatened by its adversaries stirring up ethnic nationalism (India – Tibetans, Turkey – Uyghurs) or buying the loyalties of the seaboard commercial elites (Japan, USA), (2) returning Taiwan into the fold and (3) acquiring hegemony over the South China Sea and ensuring the security of the sea routes supplying it with natural resources. The major obstacles to the latter two are the “dangerous democracies” of Japan and India, with the US hovering in the background. In contrast, the northern border is considered secure, and more generally, Russia and Central Asia are seen as sources of natural resource supplies that are more secure than the oceanic routes.

#### Newest research validates our models on warming.

Dawn Levy, 4-4-2012, Oak Ridge Leadership Computing Facility, “Carbon Dioxide Caused Global Warming at Ice Age’s End, Pioneering Simulation Shows,” <http://www.olcf.ornl.gov/2012/04/04/carbon-dioxide-caused-global-warming-at-ice-ages-end-pioneering-simulation-shows/>

The work builds on a continuous simulation by Liu and colleagues of Earth’s climate between 21,000 and 14,000 years ago, reported in a 2009 Science article detailing the first continuous simulation of climate change during Earth’s most recent period of natural global warming. Using ORNL’s Cray X1E supercomputer named Phoenix and the even faster Cray XT system called Jaguar, the scientists used nearly a million processor hours in 2008 to run one-third of their simulation, from 21,000 years ago (the most recent glacial maximum) to 14,000 years ago (the most recent major period of natural global warming). The effort validated the ability to simulate large climate changes in the past and is critical for assessing future projections of changes, such as the fate of ocean circulation in the face of continued glacial melting in Greenland and Antarctica.

### 2AC sequestration DA

#### No impact to sequester – agencies can avoid sequester impacts – history and budget committees prove.

WSJ (The Wall Street Journal), 2-7-2013, “The Unscary Sequester,” http://online.wsj.com/article/SB10001424127887324156204578276262281998922.html

Washington is in a fit of collective terror over the "sequester," aka the impending across-the-board spending cuts. Trying to explain the zero economic growth at the end of 2012, White House spokesman Jay Carney blamed Republicans for "talk about letting the sequester kick in as though that were an acceptable thing." He left out that President Obama proposed the sequester in 2011. Then on Tuesday Mr. Obama warned about "the threat of massive automatic cuts that have already started to affect business decisions." He proposed tax increases and "smaller" spending cuts to replace the sequester until Congress and he can agree to another not-so-grand-bargain. It's nice to see Mr. Obama worry about "business decisions" for a change, but listening to his cries of "massive" cuts is like watching "Scary Movie" for the 10th time. You know it's a joke. The sequester that nobody seems to love would cut an estimated $85 billion from the budget this fiscal year starting in March. Half of the savings would come from defense and half from domestic discretionary programs. Medicare providers would take a 2% cut. This "doomsday mechanism," as some in the Administration call it, was the fallback when the White House and Republicans couldn't agree during the 2011 debt-ceiling negotiations. The White House strategy was to create a fiscal hatchet that would disproportionately carve up the defense budget to force the GOP to raise taxes. The Pentagon absorbs half the sequester cuts though it is only about 19% of the budget. This hasn't worked. [image] Republicans have rightly concluded after two years of being sucker-punched that the sequester is the main negotiating leverage they have and may be the only way to restrain spending. So now Democrats and a gaggle of interest groups are denouncing Mr. Obama's fiscal brainchild because the programs they cherish—from job training to education, to the EPA and energy subsidies, to money for Planned Parenthood—are about to get chopped too. Fear not. As always in Washington when there is talk of cutting spending, most of the hysteria is baseless. The nearby table from the House Budget Committee shows that programs are hardly starved for money. In Mr. Obama's first two years, while private businesses and households were spending less and deleveraging, federal domestic discretionary spending soared by 84% with some agencies doubling and tripling their budgets. Spending growth has slowed since Republicans took the House in 2011. Still, from 2008-2013 federal discretionary spending has climbed to $1.062 trillion from $933 billion—an increase of 13.9%. Domestic programs grew by 16.6%, much faster than the 11.6% for national security. Transportation funding alone climbed to $69.5 billion in 2010 with the stimulus from $10.7 billion in 2008, and in 2013 the budget is still $17.9 billion, or about 67% higher. Education spending more than doubled in Mr. Obama's first two years and is up 18.6% to $68.1 billion from 2008-2013. But wait—this doesn't include the recent Hurricane Sandy relief bill. Less than half of that $59 billion is going to storm victims while the rest is a spending end-run around the normal appropriations process. Add that money to the tab, and total discretionary domestic spending is up closer to 30% from 2008-2013. The sequester would claw that back by all of about 5%.

#### No causal relationship – ignores other variables

Niall Ferguson (Laurence A. Tisch Professor of History at Harvard University and a Senior Fellow at the Hoover Institution at Stanford University) 2006 Foreign Affairs, September/October, Vol. 85, Issue 5

Nor can economic crises explain the bloodshed. What may be the most familiar causal chain in modern historiography links the Great Depression to the rise of fascism and the outbreak of World War II. But that simple story leaves too much out. Nazi Germany started the war in Europe only after its economy had recovered. Not all the countries affected by the Great Depression were taken over by fascist regimes, nor did all such regimes start wars of aggression. In fact, no general relationship between economics and conflict is discernible for the century as a whole. Some wars came after periods of growth, others were the causes rather than the consequences of economic catastrophe, and some severe economic crises were not followed by wars.

#### Obama is backing off from the sequester – plan doesn’t cause a trade-off.

Mark Felsenthal & Roberta Rampton, 2-8-2013, Reuters, “White House warns of damaging "sequestration" spending cuts,” <http://www.reuters.com/article/2013/02/08/us-usa-fiscal-whitehouse-idUSBRE9170SQ20130208>

The administration repeated its plea to Congress to put off the planned reductions, which the White House said would slash non-defense programs by 9 percent across the board and defense programs by 13 percent in the current fiscal year, resulting in "furloughs," or temporary layoffs, for hundreds of thousands of government workers. White House economic aide Jason Furman said it was up to Congress to work out the details of how to raise revenues and cut spending so both sides have time to agree on how replace the sequester with a more acceptable fiscal belt-tightening program. "What we're trying to do now is make sure Congress can buy the time it needs in order to do this entitlement reform, tax reform, that's a much better solution to our problems than letting the sequester hit," Furman said. Republicans said that while they agree sequestration could be devastating, the president must propose spending cuts if he wants to see the deep automatic cuts replaced with something more palatable. "Spending is still the problem," said Brendan Buck, a spokesman for House of Representatives Speaker John Boehner. "It's time to finally make the cuts and reforms we all know are needed to save and strengthen our safety net programs." Republican aides said there had been no outreach from the White House to senior members of their party on the sequester. "Not a peep," a Senate Republican leadership aide said.

#### Sequestration cuts inevitable – no grand bargain, tax revenue, GOP split.

Alex Altman, 2-6-2013, Time, “A Guide to Sequestration, the Bad Budget Policy We May Not Be Able to Avoid,” <http://swampland.time.com/2013/02/06/a-guide-to-sequestration-the-terrible-horrible-no-good-policy-that-may-wreck-the-economic-recovery/>

Now the U.S. is just weeks away from swallowing the poison pill. The fiscal cliff deal brokered on New Year’s Eve postponed the cuts for two months, but now they are set to take effect on March 1, and a solution to the sequester is nowhere in sight. Which is why President Obama on Tuesday afternoon called for Congress to stave off the sequester for a few more months, hoping such a move might buy time for lawmakers to replace it with smarter spending cuts. “The good news is, this doesn’t have to happen,” Obama said. According to a projection released Tuesday by the Congressional Budget Office, sequestration would cut U.S. economic growth in 2013 by half. The White House predicts it would cause the economy to shed hundreds of thousands of jobs. This might seem like incentive enough for the two parties to find the $85 billion in deficit reduction necessary to delay sequestration from taking effect next month. But it won’t be easy. “I think the sequester is going to happen,” Republican Congressman Paul Ryan said Sunday on NBC’s Meet the Press. “We think these sequesters will happen because the Democrats have opposed our efforts to replace those cuts with others–and they’ve offered no alternatives.” Obama, who in 2011 said he would veto any attempt to sidestep the sequester, offered an alternative Tuesday in the form of a stopgap bill. But he insisted that any deficit-reduction package to replace the sequester contain a mix of spending cuts and tweaks to the federal tax code, which means new revenues. This is a deal-breaker for Republicans, who forswore new taxes after a fiscal cliff deal that raised them for the first time in a generation. The impasse has members of both parties warning, once again, that an unthinkable policy is becoming a very real possibility. “I think people want it to happen,” Republican Sen. Tom Coburn, who favors replacing the sequester, told the New York Times. Both sides say that’s not true. But the glimpse of the wrecking ball has both parties scrambling to disown a policy that both houses of Congress passed and the President signed. Republicans have stepped up their effort to charge the White House with cooking up the idea, hoping to pin the blame for the coming cuts on somebody else. As the Washington Post notes, House Speaker John Boehner used the phrase “the President’s sequester” (or some variant thereof) five times during a single floor speech Monday. (While the White House disputes that it came up with the sequester, Post reporter Bob Woodward and Post fact-checker Glenn Kessler say the idea originated with the White House.) “President Obama first proposed the sequester and insisted it become law,” Boehner said in a statement Tuesday. “Republicans have twice voted to replace these arbitrary cuts with common-sense cuts and reforms that protect our national defense. We believe there is a better way to reduce the deficit, but Americans do not support sacrificing real spending cuts for more tax hikes.” For its part, the White House will blame Republicans for refusing to reduce tax breaks that benefit the wealthy. Democrats, who are seeking some $600 billion in new revenues, want to dump sweetheart provisions that protect owners of corporate jets or financiers who benefit from low carried-interest rates.” In our view, hedge fund managers should not be paying at a significantly lower rate than bus drivers or clerical assistants or store managers,” Carney said, noting that Republicans have been open to closing tax loopholes in past negotiations. “If that was true then, it’s got to be true now. Obama also offered to revive dormant talks to reach a sweeping deal to slash the federal deficit and overhaul the U.S. tax code and entitlement systems. ”The balanced approach of spending cuts and entitlement reform and tax reform that I put forward are still on the table,” Obama told reporters at the White House. But it would be very tough to iron out a grand bargain — a deal so thorny and elusive that it spawned the sequester in the first place — in the space of a few months, let alone a few weeks. If Republicans won’t give way on new revenues, it would become impossible. And there is no sense the GOP is prepared to cave, particularly because many of its members have sought the deep cuts the sequester would produce.

#### Republicans will force the sequester to happen – multiple reasons.

Chris Cillizza, 2-5-2013, Washington Post, “How the sequester became politically inevitable,” <http://www.washingtonpost.com/blogs/the-fix/wp/2013/02/05/how-the-sequester-became-politically-inevitable/>

The theory of the sequester was a simple one: By combining the threat of large-scale defense cuts, which Republicans abhor, with large-scale domestic program cuts, which Democrats abhor, Congress and the White House could spur itself into action to addressing the nation’s long term debt and spending issues since the alternative was politically unpalatable. In the third presidential general election debate last October, President Obama, under attack from Mitt Romney about the possibility of the sequester going into effect, stated bluntly: “It will not happen.” Obama was breaking no new ground with that statement. There was almost no one who thought that any Member of Congress would let the sequester go into effect. Then came the fiscal cliff fight in late 2012. While there were all sorts of political machinations and maneuvers during that time, the most important one was that House Speaker John Boehner proved unable to round up the votes to pass a proposal that would have exempted all but those making $1 million or more a year from a tax increase. What the failure of Boehner’s “Plan B” proved is that not voting on something – particularly something that contains a series of politically unpopular things like raising taxes or cutting programs — is a whole heck of a lot easier than voting on it. (The motto of Congress is, to quote Paul Rudd in “Forgetting Sarah Marshall”: “Do less.”)And, all of a sudden, the prospect of the sequester, which requires Congress to — you guessed it — do nothing, didn’t seem all that bad. For Republicans, the sequester accomplished two things simultaneously: 1) it allowed them to avoid voting on (and, therefore, owning) a package that included tax reforms/increases as well as spending cuts and 2) it ensured more than $1 trillion in federal spending. While some elements of the party — John McCain being the most prominent — argued that the sequester would do considerable damage to the military, there seemed (and seems) to be a tacit understanding that letting it simply happen wouldn’t be the worst thing ever. And so, it wasn’t terribly surprising that Boehner pooh-poohed the idea of a short term fix almost as soon as Obama proposed it. “President Obama first proposed the sequester and insisted it become law,” Boehner said in a statement Tuesday. “Republicans have twice voted to replace these arbitrary cuts with common-sense cuts and reforms that protect our national defense…..The president’s sequester should be replaced with spending cuts and reforms that will start us on the path to balancing the budget in 10 years.” It remains to be seen whether Boehner moves off of that negotiating position or if Obama is willing to compromise on what sorts of tax changes would be in his short term proposal. But, make no mistake — the sequester allows politicians to do what comes naturally to them: Blame the other guy for the problem and keep their hands clean(ish). Which is why it still very well may happen.

#### No deal to stop the sequester – defense hawks are not on board.

Bernie Becker & Jeremy Herb, 2-6-2013, The Hill, “GOP’s sequester bill unlikely to get revote,” <http://thehill.com/blogs/on-the-money/budget/281347-gops-bill-unlikely-to-get-revote>

Republicans have become more reluctant to pass legislation that will almost certainly be dead on arrival in the Democratic-led Senate, and they want to force senators to take the sort of tough votes they believe happened in the House over the last two years. Rank-and-file Republicans are frustrated that Senate Democrats have not approved a budget resolution for four years, and they lashed out at Obama this week for missing his deadline to present a budget this year. Democrats in the Senate haven’t produced a budget for fear it would expose splits in the party. The GOP is also frustrated because it views sequestration as the White House’s idea. Republicans are emphasizing this week that sequestration was demanded by the White House as part of the 2011 deal to raise the debt ceiling. They argue Obama and Senate Democrats should offer spending cuts to prevent it. Rep. Tom Cole (R-Okla.) stressed that the GOP would rather let the sequester go into effect than consent to more revenues after agreeing to a “fiscal cliff” deal that raised taxes on wealthier households. “The president got tax increases without spending cuts 45 days ago. He ought to be able to take spending cuts without revenues today,” Cole told reporters on Tuesday. “It’s either going to be the sequester as written, or a preferable reallocation of the spending cuts. But it’s going to be spending cuts,” he added. Yet there are splits within the GOP over how hard the party should work to prevent the cuts. Rep. Duncan Hunter (R-Calif.), who voted against the 2011 debt-ceiling deal because of sequestration, is not optimistic it will be stopped. “There’s a reason a few of us voted against it, and it wasn’t just to say we voted against it,” said Hunter, who criticized Boehner last month for declaring that defense hawks would support letting sequestration happen. “We thought, ‘Once this thing starts, there’s no stopping it.’ And that’s exactly what happened now.” Still, Republican defense hawks in the House and Senate also did not back the president’s latest call for new revenues as part of a short-term sequester deal.

#### Gun control thumps

AP, 2-8-2013, “Keystone of Obama gun control plan gains steam as Dem, GOP senators seek background check pact,” Washington Post, http://www.washingtonpost.com/politics/congress/dem-gop-senators-quietly-seek-background-check-deal-that-could-improve-gun-control-prospects/2013/02/08/5362c63a-71cb-11e2-b3f3-b263d708ca37\_story.html

A cornerstone of President Barack Obama’s drive to check gun violence is gathering bipartisan steam as four senators, including two of the National Rifle Association’s congressional champions, privately seek compromise on requiring far more firearms purchasers to undergo background checks. The talks are being held even as Obama’s call to ban assault weapons and high-capacity ammunition magazines, the two other major pillars of his plan, are hitting rough waters on Capitol Hill. An agreement among the four senators to expand background checks would add significant impetus to that high-profile proposal by getting the endorsement of a group that ranges from one of the Senate’s most liberal Democrats to one of its most conservative Republicans.

#### The plan would be a political motivator for nuclear power development – solves the waste issue.

Barry Brook & Tom Blees, 10-23-2012, a leading environmental scientist, holding the Sir Hubert Wilkins Chair of Climate Change at the School of Earth and Environmental Sciences, and is also Director of Climate Science at the University of Adelaide’s Environment Institute, published three books, over 200 refereed scientific papers, is a highly cited researcher, received a number of distinguished awards for his research excellence including the Australian Academy of Science Fenner Medal, is an International Award Committee member for the Global Energy Prize, Australian Research Council Future Fellow, ISI Researcher, Ph.D., Macquarie University in Environmental Engineering, Science Council for Global Initiatives, Edgeworth David Medal Royal Society of NSW, Cosmos Bright Sparks Award, Tom Blees is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, BraveNewClimate, “The Case for Near-term Commercial Demonstration of the Integral Fast Reactor,” <http://bravenewclimate.com/2012/10/23/the-case-for-near-term-commercial-demonstration-of-the-integral-fast-reactor/>

Light-water reactors (LWR) of any stripe, however, produce only a tiny fraction of the potential energy in uranium, less than 1%. Fast reactors, in contrast, unlock nearly all of it. The IFR, with its metal-fuel system and pyroprocessing, is able to utilize the actinides to such an extent as to essentially solve the waste problem by reducing the radiological toxicity of the waste products from hundreds of thousands of years to a mere few hundred years. Even if the “million-year problem” of LWR spent fuel is more a political than a technical challenge (given the small volume of the waste stream), nevertheless the issue of public perception of that issue is the one that guides nuclear policy in many countries [14]. As such, the transition to fast reactors and a closed nuclear fuel cycle is both a technical advancement and a political enabler for nuclear power of all kinds.

#### Democrats will use the plan as a bargaining chip to overcome opposition.

Mariah Blake, January/February 2010, is an editor at the Washington Monthly; her work has also appeared in Christian Science Monitor and Foreign Policy, Mother Jones, “The Bailout Goes Nuclear,” <http://www.motherjones.com/environment/2010/01/bailout-nuclear>

Key Senate Democrats have signaled that they are willing to use nuclear subsidies as a bargaining chip to overcome Republican opposition. The Nuclear Energy Institute (NEI), the industry's main lobby, is pushing for at least $100 billion in federal loan guarantees—a dicey proposition given that the Congressional Budget Office has determined that the risk of default would be "well above 50 percent." This raises the question: Will the cost of passing a climate bill be a massive, taxpayer-funded nuclear bailout? The public has rescued the industry once before. The last batch of reactors built in the US during the 1970s and '80s was plagued by a series of boondoggles, one of the most infamous being Long Island's Shoreham Nuclear Power Plant, which took 20 years to build and cost $6 billion—more than 80 times the original estimate—but was never put into commercial operation. Similar debacles pushed utilities into bankruptcy, triggered the largest municipal bond default in US history, and helped cause a sixfold increase in wholesale electricity prices. The total cost to the public, in rate hikes and taxpayer bailouts, was more than $300 billion (in 2006 dollars), according to the Union of Concerned Scientists. Since that time, the industry says it has solved its cost problem, partly by engineering reactors that are simpler and less expensive to build. But the first two next-generation reactors, which are under construction in Finland and France, have been bogged down in multibillion-dollar cost overruns. Meanwhile, the projected cost of building new nuclear plants in the US is soaring: As recently as 2005, the NEI claimed new reactors could be constructed for roughly $2 billion. Newer estimates, including one by Moody's, the credit ratings agency, put the cost as high as $12 billion. That would make nuclear power more expensive on a watt-for-watt basis than most large-scale renewable energy sources, including wind, biomass, and hydropower. No wonder the industry has found it impossible to secure private-sector financing for the 28 reactors that are currently in the pipeline across the nation. Investors "will not accept the economic risk of building new reactors," says Peter Bradford, a former member of the Nuclear Regulatory Commission who is now a professor at Vermont Law School. "There will be no nuclear renaissance beyond what the government is willing to underwrite. "No one understands this better than the industry itself, which is lobbying for a Senate bill to create a Clean Energy Deployment Administration (CEDA) within the Department of Energy (DOE) that would have the authority to award a virtually unlimited number of loan guarantees—without congressional review. "It's a nuclear slush fund," says Michele Boyd, director of Physicians for Social Responsibility's safe energy program, "though the way the bill is written, even many Senate staffers don't know it." The legislation, which is likely to be folded into the climate bill, was sponsored by Sen. Jeff Bingaman (D-N.M.) and crafted with the help of Sen. Lisa Murkowski (R-Alaska). Both lawmakers are top recipients of the nuclear industry's campaign largesse. Under the policy, companies would have to pay an as yet unspecified subsidy fee in order to get loan guarantees, but these payments are all but certain to be dwarfed by the cost of defaults. According to the Union of Concerned Scientists, if 100 new plants are built, as key Republican lawmakers have called for, the price of bad loans could total at least $360 billion—and that's assuming zero cost overruns. The ceda provision builds on the work of Sen. Pete Domenici (R-N.M.), who until his retirement in January 2009 was the Senate's most tireless nuclear crusader. During his reign as chairman of the energy committee from 2003 to 2007, he packed the committee staff with former nuclear-power lobbyists—a clique dubbed "the glow-in-the-dark crew" by some of their Senate colleagues—who shepherded through Congress the Energy Policy Act of 2005. Among other things, the bill provided $13 billion in nuclear subsidies and federal loan guarantees to cover 80 percent of the costs of building low-carbon nuclear technologies, including new reactors. For any other industry, this would have been an enormous victory. But for nuclear, even these generous subsidies weren't enough. In July 2007, six of the nation's largest financial firms—including Citigroup, Lehman Brothers, and Goldman Sachs, companies hardly averse to risky investments—informed the DOE in a letter that nuclear projects would not find financing because they were too chancy. Unless, of course, the agency (which had interpreted the new law to mean 80 percent of project debt) would rewrite the rules so that 100 percent of the debt was covered—foisting almost all of the risk on taxpayers. By the end of 2007, the nuclear lobby had succeeded in getting the DOE to make exactly these changes. But to the industry's dismay, Congress has so far given the DOE authority to distribute $18.5 billion in loan guarantees for nuclear power facilities. That's less than half what UniStar hopes to spend on its four plants, not to mention the needs of the industry at large. So the industry began pushing to increase the funding and simultaneously exempt the program from congressional oversight. Part of NEI's strategy for getting the feds to hand out loan guarantees more freely has been to win over Democrats—who have traditionally been less friendly to nuclear power—by enlisting the help of organized labor. In mid-2008, the group added Michael Mathis and Charles Harple, previously top in-house lobbyists for the International Brotherhood of Teamsters, to its K Street bench. NEI also forged an alliance with the AFL-CIO. At NEI's annual conference in 2008, Mark Ayers, the AFL-CIO's president of Building and Construction Trades, said that in exchange for the industry's commitment to use union labor, his organization would work to "persuade the new majority in Congress about the need for extending and increasing the loan guarantee program." The industry's efforts began to pay off this fall, as nuclear subsidies emerged as the key to wooing Republican votes for a Senate climate bill—votes necessary to offset defections from coal-state Democrats. Since October, Sen. John Kerry (D-Mass.), one of the climate bill's sponsors, has been holding closed-door meetings with Republicans to craft nuclear language. "You listen to the rhetoric around this place and there is no one who will say a disparaging word about nuclear," says a senior Democractic Senate staffer close to the climate bill talks. "They have enough political muscle and enough support across the aisle that I think they will get all the loan guarantees they need."

#### Loan guarantees specifically popular to both sides of the aisle because of lower tax liability.

Sharon Squassoni, November 2009, is a senior associate at the Carnegie Endowment for International Peace in the nonprolifera-tion program. Prior to joining Carnegie, she held various positions in the US government, including at the Congressional research Service, the Arms Control and Disarmament Agency, and the US State Department, is a frequent contributor to journals, magazines and books on nuclear proliferation and defense, The Centre for International Governance Innovation, No. 7, “The US Nuclear Industry: Current Status and Prospects under the Obama Administration,” p. 8, <http://www.carnegieendowment.org/files/Nuclear_Energy_7_0.pdf>

The single most important spur to build new reactors in the United States is loan guarantees. In fact, industry sources indicate they are so critical that new plants may not be built without them. These guarantees are attractive to the US Congress because they offer a way to influence markets and incentivize specific projects, and because they are “scored” as a lower liability for the taxpayer than the actual amount. Thus, a potential US$50 billion in loan guarantees could be scored by the Congressional Budget Office as only costing the taxpayer US$500 million. As originally proposed in the Energy Policy Act (EPACT) of 2005, loan guarantees would only have applied to nuclear power, but this was broadened to apply to a wide range of “innovative energy technologies,” including renewable energy technologies, which further extends their attractiveness within Congress.

#### Nuclear makes it distinct to Congress.

Jim Snyder, 9-14-2012, Bloomberg, “Republican-Led House Passes Bill to Block Energy Loans,” <http://www.bloomberg.com/news/2012-09-14/republican-led-house-passes-bill-to-block-energy-loans.html>

The U.S. House passed legislation to end an energy loan-guarantee program, the culmination of a Republican-led investigation into the collapse of solar-panel maker Solyndra LLC last year. The “No More Solyndras Act,” adopted by a 245-161 vote, wouldn’t immediately halt the loan program. It would prevent the Energy Department from considering applications for government backing submitted since Dec. 31. With $34 billion in loan authority remaining, Democrats said the bill would let nuclear- power projects favored by Republicans go forward.

#### Political capital theory not true, but winners-win is\*\*\*

Michael Hirsh, 2-7-2013, is chief correspondent for National Journal, he also contributes to 2012 Decoded, previously served as the senior editor and national economics correspondent for Newsweek, based in its Washington bureau, was also Newsweek’s Washington web editor and authored a weekly column for Newsweek.com, NationalJournal, “There’s No Such Thing as Political Capital,” <http://www.nationaljournal.com/magazine/there-s-no-such-thing-as-political-capital-20130207>

\*\*\*cites George Edwards, a presidential scholar at Texas A&M University, Richard Bensel, a government professor at Cornell University, and Norman Ornstein of the American Enterprise Institute\*\*\*

On Tuesday, in his State of the Union address, President Obama will do what every president does this time of year. For about 60 minutes, he will lay out a sprawling and ambitious wish list highlighted by gun control and immigration reform, climate change and debt reduction. In response, the pundits will do what they always do this time of year: They will talk about how unrealistic most of the proposals are, discussions often informed by sagacious reckonings of how much “political capital” Obama possesses to push his program through. Most of this talk will have no bearing on what actually happens over the next four years. Consider this: Three months ago, just before the November election, if someone had talked seriously about Obama having enough political capital to oversee passage of both immigration reform and gun-control legislation at the beginning of his second term—even after winning the election by 4 percentage points and 5 million votes (the actual final tally)—this person would have been called crazy and stripped of his pundit’s license. (It doesn’t exist, but it ought to.) In his first term, in a starkly polarized country, the president had been so frustrated by GOP resistance that he finally issued a limited executive order last August permitting immigrants who entered the country illegally as children to work without fear of deportation for at least two years. Obama didn’t dare to even bring up gun control, a Democratic “third rail” that has cost the party elections and that actually might have been even less popular on the right than the president’s health care law. And yet, for reasons that have very little to do with Obama’s personal prestige or popularity—variously put in terms of a “mandate” or “political capital”—chances are fair that both will now happen. What changed? In the case of gun control, of course, it wasn’t the election. It was the horror of the 20 first-graders who were slaughtered in Newtown, Conn., in mid-December. The sickening reality of little girls and boys riddled with bullets from a high-capacity assault weapon seemed to precipitate a sudden tipping point in the national conscience. One thing changed after another. Wayne LaPierre of the National Rifle Association marginalized himself with poorly chosen comments soon after the massacre. The pro-gun lobby, once a phalanx of opposition, began to fissure into reasonables and crazies. Former Rep. Gabrielle Giffords, D-Ariz., who was shot in the head two years ago and is still struggling to speak and walk, started a PAC with her husband to appeal to the moderate middle of gun owners. Then she gave riveting and poignant testimony to the Senate, challenging lawmakers: “Be bold.” As a result, momentum has appeared to build around some kind of a plan to curtail sales of the most dangerous weapons and ammunition and the way people are permitted to buy them. It’s impossible to say now whether such a bill will pass and, if it does, whether it will make anything more than cosmetic changes to gun laws. But one thing is clear: The political tectonics have shifted dramatically in very little time. Whole new possibilities exist now that didn’t a few weeks ago. Meanwhile, the Republican members of the Senate’s so-called Gang of Eight are pushing hard for a new spirit of compromise on immigration reform, a sharp change after an election year in which the GOP standard-bearer declared he would make life so miserable for the 11 million illegal immigrants in the U.S. that they would “self-deport.” But this turnaround has very little to do with Obama’s personal influence—his political mandate, as it were. It has almost entirely to do with just two numbers: 71 and 27. That’s 71 percent for Obama, 27 percent for Mitt Romney, the breakdown of the Hispanic vote in the 2012 presidential election. Obama drove home his advantage by giving a speech on immigration reform on Jan. 29 at a Hispanic-dominated high school in Nevada, a swing state he won by a surprising 8 percentage points in November. But the movement on immigration has mainly come out of the Republican Party’s recent introspection, and the realization by its more thoughtful members, such as Sen. Marco Rubio of Florida and Gov. Bobby Jindal of Louisiana, that without such a shift the party may be facing demographic death in a country where the 2010 census showed, for the first time, that white births have fallen into the minority. It’s got nothing to do with Obama’s political capital or, indeed, Obama at all. The point is not that “political capital” is a meaningless term. Often it is a synonym for “mandate” or “momentum” in the aftermath of a decisive election—and just about every politician ever elected has tried to claim more of a mandate than he actually has. Certainly, Obama can say that because he was elected and Romney wasn’t, he has a better claim on the country’s mood and direction. Many pundits still defend political capital as a useful metaphor at least. “It’s an unquantifiable but meaningful concept,” says Norman Ornstein of the American Enterprise Institute. “You can’t really look at a president and say he’s got 37 ounces of political capital. But the fact is, it’s a concept that matters, if you have popularity and some momentum on your side.” The real problem is that the idea of political capital—or mandates, or momentum—is so poorly defined that presidents and pundits often get it wrong. “Presidents usually over-estimate it,” says George Edwards, a presidential scholar at Texas A&M University. “The best kind of political capital—some sense of an electoral mandate to do something—is very rare. It almost never happens. In 1964, maybe. And to some degree in 1980.” For that reason, political capital is a concept that misleads far more than it enlightens. It is distortionary. It conveys the idea that we know more than we really do about the ever-elusive concept of political power, and it discounts the way unforeseen events can suddenly change everything. Instead, it suggests, erroneously, that a political figure has a concrete amount of political capital to invest, just as someone might have real investment capital—that a particular leader can bank his gains, and the size of his account determines what he can do at any given moment in history. Naturally, any president has practical and electoral limits. Does he have a majority in both chambers of Congress and a cohesive coalition behind him? Obama has neither at present. And unless a surge in the economy—at the moment, still stuck—or some other great victory gives him more momentum, it is inevitable that the closer Obama gets to the 2014 election, the less he will be able to get done. Going into the midterms, Republicans will increasingly avoid any concessions that make him (and the Democrats) stronger. But the abrupt emergence of the immigration and gun-control issues illustrates how suddenly shifts in mood can occur and how political interests can align in new ways just as suddenly. Indeed, the pseudo-concept of political capital masks a larger truth about Washington that is kindergarten simple: You just don’t know what you can do until you try. Or as Ornstein himself once wrote years ago, “Winning wins.” In theory, and in practice, depending on Obama’s handling of any particular issue, even in a polarized time, he could still deliver on a lot of his second-term goals, depending on his skill and the breaks. Unforeseen catalysts can appear, like Newtown. Epiphanies can dawn, such as when many Republican Party leaders suddenly woke up in panic to the huge disparity in the Hispanic vote. Some political scientists who study the elusive calculus of how to pass legislation and run successful presidencies say that political capital is, at best, an empty concept, and that almost nothing in the academic literature successfully quantifies or even defines it. “It can refer to a very abstract thing, like a president’s popularity, but there’s no mechanism there. That makes it kind of useless,” says Richard Bensel, a government professor at Cornell University. Even Ornstein concedes that the calculus is far more complex than the term suggests. Winning on one issue often changes the calculation for the next issue; there is never any known amount of capital. “The idea here is, if an issue comes up where the conventional wisdom is that president is not going to get what he wants, and he gets it, then each time that happens, it changes the calculus of the other actors” Ornstein says. “If they think he’s going to win, they may change positions to get on the winning side. It’s a bandwagon effect.”

## 1AR

### prolif

#### Lack of U.S. fast reactor development ruins tech leadership and causes fragmented international proliferation.

Tom Blees, 2008, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, Prescription for the Planet, p. 323-4

These six nations, plus the United States, are responsible for some 60% of the world’s human-caused greenhouse gas emissions. While not all are members of the “nuclear club,” all of them have the technology to pursue both nuclear fuel reprocessing and breeder reactor technology, and with the sole exception of Germany the six mentioned above are either already involved or in the planning stages. America’s hope of acting as a model for other nations by eschewing breeder reactors and fuel reprocessing has clearly been unsuccessful, despite the best of intentions when that course was originally charted. Rather than encouraging stability, it now only exacerbates a fragmented international situation where several countries pursue their own nuclear programs without the benefit of technology sharing and international oversight. The American position is based not on realism but on a dangerously outmoded political calculation for domestic purposes. When it comes to either nuclear weapons or civilian nuclear power, engaging with the world is a far better course than self-deception. Breeder reactor technology was recognized in the Fifties sabering essential to fulfilling the promise of virtually unlimited power from nuclear fission. Until now the price of uranium has been so low that the path of least resistance encouraged thermal reactors and once-through fuel cycles, despite the fact that long-lived nuclear waste has been piling up around the world without any reasonable plans for its safe disposal. Now, with global warming seeming to put324nuclear power back on the table despite its opponents’ disapproval, fast reactor technology not only looks good from a fuel supply perspective, but it also promises to clean up the waste issue that is the legacy of the thermal reactor age.

#### New nuclear capacity is key – solves all the alt causes.

Pete Domenici & Warren F. Miller, July 2012, is an American Republican politician, who served six terms as a U.S. Senator from New Mexico, serves as a Senior Fellow at the Bipartisan Policy Center, where he focuses on budget and nuclear energy issues, and Warren F. Miller, PhD, is a private consultant and a part time Research Professor at Texas A & M University, served as assistant secretary for nuclear energy at the U.S. Department of Energy, served as associate director of the Nuclear Security Science and Policy Institute at Texas A & M University as well as adjunct professor, Bipartisan Policy Center, “Maintaining U.S. Leadership in Global Nuclear Energy Markets,” <http://bipartisanpolicy.org/sites/default/files/Leadership%20in%20Nuclear%20Energy%20Markets.pdf>

As the world’s largest commercial nuclear operator and dominant weapons state, the United States has traditionally been the clear leader on international nuclear issues. Today, the United States still accounts for approximately one-quarter of commercial nuclear reactors in operation around the world and one-third of global nuclear generation.33 This position is likely to shift in coming decades, as new nuclear investments go forward in other parts of the world while slowing or halting in the United States. In past decades, the United States was also a significant exporter of nuclear materials and technologies, but this dominance too has slowly declined. At present, however, the U.S. safety and security infrastructure and regulatory framework remain without peer and U.S. expertise and guidance on operational and regulatory issues continues to be sought around the world. The domestic nuclear industry established the INPO in the wake of the Three Mile Island accident in 1979 in a collective effort to hold all industry players accountable to the highest standards for safe and reliable commercial operations. Similarly, the NRC is seen as the gold standard for commercial nuclear regulation. As long as other countries seek to learn from the experience and expertise of U.S. firms and regulators, the United States will enjoy greater access to international nuclear programs. A substantial reduction in domestic nuclear energy activities could erode U.S. international standing.

#### Power reactors are not used to produce weapon plutonium – no separation of the actinides.

Tom Blees, 1-3-2012, is the author of Prescription for the Planet, the president of the Science Council for Global Initiatives, member of the selection committee for the Global Energy Prize, Do the Math, “Nuclear Options,” <http://physics.ucsd.edu/do-the-math/2012/01/nuclear-options/>

It’s not just that the fuel recycling in an IFR is done on-site. The pyroprocessing never separates actinides, so there’s no more danger of separating out plutonium than in regular spent fuel from light-water reactors (which also contains plutonium). Besides, in both cases the plutonium is no good for weapons. It’s far too contaminated with non-weapons-grade isotopes of plutonium. Contrary to uninformed but commonly-believed opinion, power reactors are NOT used to produce weapons-grade plutonium. It’s done in special reactors built for that purpose. It could be done in almost any reactor with special effort, but extracting it would still require an expensive aqueous reprocessing system. The use of one of the many small research reactors spread around the world at universities and elsewhere would be a far easier source of surreptitious plutonium production than a commercial power reactor.

#### Nuclear reprocessing will spur more proliferation resistant objectives – fast reactors limit handling of fuel cores.

Sharon Squassoni, May 2007, is a senior associate with the Nonproliferation Program at the Carnegie Endowment for International Peace, Arms Control Association, “Risks and Realities: The “New Nuclear Energy Revival”,” <http://www.armscontrol.org/act/2007_05/squassoni>

A nuclear renaissance that embraces reprocessing as necessary to reduce spent fuel accumulation could result in more plutonium in transit, providing more potential targets for diversion. A renaissance that includes widespread installation of fast reactors would similarly increase targets for diversion. Further down the road, will the next generation of reactors be more or less proliferation resistant than existing reactors? As of December 2002, the Generation IV Forum had not yet adopted a standard methodology for evaluating proliferation resistance and physical protection for the six systems under consideration.[28] Finally, there is a larger question of whether technological developments will outpace nonproliferation initiatives, such as fuel supply assurances and multinational fuel-cycle centers, voluntary export guidelines, and further restrictions within the Nuclear Suppliers Group. Some recent criticism of the U.S. GNEP program has been aimed at the aggressive timeline for technology demonstration of advanced reprocessing, in contrast to developments more closely tied to nonproliferation objectives, such as supporting more proliferation-resistant reactors with sealed fuel cores that would limit handling of fuel.[29]

#### Pyroprocessing would eliminate proliferation risks from reprocessing transportation – elimination of actinides and on-site reprocessing.

Stephen Berry & George S. Tolley, 11-29-2010, James Franck Distinguished Service Professor Emeritus at the University of Chicago, Fellow, American Academy of Arts and Sciences, foreign Member, Royal Danish Academy of Sciences, member and Home Secretary, National Academy of Sciences, J. Heyrovsky Honorary Medal for Merit in the Chemical Sciences, Academy of Sciences of the Czech Republic, Alexander von Humboldt-Stiftung Senior Scientist Award, Phi Beta Kappa National Lecturer, George S. Tolley is a professor emeritus in Economics at the University of Chicago, fellow, American Association for the Advancement of Science, honorary editor, Resource and Energy Economics, honorary Ph.D., North Carolina State University, “Nuclear Fuel Reprocessing Future Prospects and Viability,” p. 11-2, <http://humanities.uchicago.edu/orgs/institute/bigproblems/Team7-1210.pdf>

In the IFR model, this is actualized in a two-step electrotransport process. First, the anode basket is lowered into the cadmium pool, which forms an anode phase upon application of an electric current. It is relevant to note that cadmium is chosen because of high solubility of uranium and plutonium as well as some trace actinides and rare-earth metals at this temperature, effectively separating them from other fission products. These actinides are then electrotransported to two separate collecting cathodes, the first being a solid electrode at which only uranium is deposited, and the second being a liquid cadmium cathode at which a mixture of uranium, plutonium, other trace actinides and rare-earth elements are deposited. Liquid cadmium is chosen for the second cathode because the activity coefficients of uranium and plutonium will be identical from anode to cathode. Thermodynamic relationships dictate that under this condition only a small voltage is required for the transportation to take place, allowing for simultaneous deposition.15 Following electrorefining, the cathodes, which have lower boiling points than the uranium and plutonium (~800 C), can be vaporized and the respective uranium and actinide compound can be melted into ingots. These will eventually be processed and used to create new fuel rods. This conveniently leaves the option of pure uranium rods or proliferation resistant (due to radioactivity and impurity) plutonium rods being fabricated. There are several other, more subtle advantages to this process to be considered as well. For example, the use of molten salt solvents instead of neutron moderating hydrocarbons reduces the risk of criticality accidents. As mentioned before, the volume of waste resulting in electrorefining is much less than aqueous methods since the highly radioactive actinides are completely removed from the solvent phase or collection equipment through vaporization, whereas PUREX produces high quantities of aqueous nitric acid waste which, although stripped of plutonium and uranium, still contains trace amounts of other radioactive actinides. Furthermore, pyroprocessing was designed for on-site reprocessing in the IFR model, meaning it is a much smaller scale operation than aqueous methods which require an entirely separate reprocessing plant. Not only would this cut down on the amount of land required, it will combat the threat of proliferation during the transportation of reprocessed fuel by eliminating this step entirely.

### ice age

#### Neither will be overly aggressive—Conflict will be terminated quickly—Both will be able to claim victory.

Ahmed 2009—Ali Ahmed, Research Fellow at the Institute for Defence Studies and Analyses, October 27, 2009, “India-Pakistan Conflict Outcome Probability,” http://www.idsa.in/idsastrategiccomments/IndiaPakistanConflictOutcomeProbability\_AAhmed\_271009

In a situation involving limited Indian war aims, Pakistan would respond with its defensive formations and use its strategic reserves in an offensive mode wherever possible.7 A Pakistani offensive, though in keeping with Pakistan’s doctrine of ‘offensive defence’8, may not eventuate in the event of an early war. Following the imposition of costs through air action, India expects to see hostilities terminated through international pressure. Air operations and pivot corps operations by India would reduce the windows available for launching Pakistani offensives inside Indian territory, which may prove very costly for Pakistan. Besides, there would be little scope for launching forces into Indian territory in the face of India’s broad front attacks. As demonstrated at Kargil, India would wrap up any gains it may make eventually. Pakistan may employ only a small proportion of its forces in defensive operations, seeking instead to preserve most of its forces for post-conflict internal political purposes, allowing its Army to stay at the apex of Pakistan’s political pyramid.9 In any post-conflict scenario military losses would compromise the Pakistan Army’s grip on power. Termination of India’s limited offensives would enable Pakistan to declare victory of sorts by claiming that it held up India’s conventional might with only a partial use of its forces. In such a circumstance, both states would be satisfied in having met respective conflict aims. India would have inflicted punishment on Pakistan and Pakistan would claim to have withstood it. Such a juncture of positive perceptions would be useful to begin strategic engagement for peace making and long term conflict resolution.10 The foregoing indicates that Pakistan’s conflict strategy is likely to comprise the following elements: war avoidance; conventional defence; counter offensive with strategic reserves;11 a resort to asymmetric war; and preservation of military assets. For Pakistan the nuclear dimension of the conflict would include a high nuclear threshold;12 nuclear signaling for deterrence; catalyzing external pressures; and, preservation of nuclear assets from attrition. Pakistan has mooted the ‘Samson Option’ only as a last resort.13 That deterrence would hold is the understandable refrain.14 Pakistan has always tried to maintain adequate conventional capability to fight India.15 It is aware it risks national suicide if it uses nuclear weapons first.16 The Pakistan Army is aware that Pakistan would be held accountable by the international community for breaching the ‘nuclear taboo’.17 Since the least provocative nuclear use option is use on its own territory, an accounting post-conflict would restrain the finger on the proverbial nuclear button.18 In military terms there are no realistic operational and tactical gains for Pakistan in resorting to nuclear first use that India cannot counter through retaliation.

#### Kashmir makes skirmishes inevitable.

Lynn Walsh (writer for The Socialist) June 2002 “The Threat of War” http://socialistworld.net/eng/2002/05/31Kashmir.html

The world is nearer to nuclear war than at any time since the Cuban missile crisis in 1962. The United States and the Soviet Union came close to a nuclear exchange, when Khrushchev based nuclear-armed missiles on Cuba. Fortunately, US imperialism and the Soviet bureaucracy negotiated their way out of the crisis, despite pressure from the US military to launch a pre-emptive strike against Cuba. They were both stable regimes, at that time, with a clear understanding of their interests and worked out military strategies. Today, India and Pakistan are very different. Both have unstable regimes of crisis. Musharraf is a shaky military dictator, while the Vajpayee government is led by the ultra-rightwing, Hindu-nationalist BJP. Once again, Kashmir is the focus of the conflict. Kashmir has been disputed for 55 years, the result of British imperialism’s divide-and-rule partition of the subcontinent when it relinquished direct rule in 1947. The Pakistan ruling class considered that, as a majority Muslim state, Kashmir should belong to Pakistan. The hereditary Maharaja of Kashmir, however, was a Hindu and opted for India. Far from being concerned with the people of Kashmir, who have been denied democracy and self-determination, both India and Pakistan want to control the state to extend their territory, power and prestige. Kashmir has already led to two wars between India and Pakistan, many crises, repeated military mobilisations, and continuous threats and counter-threats. But it would be a mistake to believe that the present crisis is just one more episode. Over a million troops, armed with modern weaponry, are now mobilised along the Indo-Pakistan border. Ultimately, this is an expression of the deep crisis in both countries. The landlords and capitalists on both sides have been incapable of securing economic progress, democracy or social harmony. Many millions on both sides live in dire poverty, lacking basic health and education provision. Both countries are torn by national, ethnic, and religious conflict.

#### Phytoplankton are resilient past extinctions prove.

Sofia Ribeiro et al 2011 Terje Berge,1 Nina Lundholm,4 Thorbjørn J. Andersen,5 Fátima Abrantes,2 and Marianne Ellegaard (Nature Communications Journal) “Phytoplankton growth after a century of dormancy illuminates past resilience to catastrophic darkness” <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3113231/>

Photosynthesis evolved in the oceans more than 3 billion years ago and has persisted throughout all major extinction events in Earth's history. The most recent of such events is linked to an abrupt collapse of primary production due to darkness following the Chicxulub asteroid impact 65.5 million years ago. Coastal phytoplankton groups (particularly dinoflagellates and diatoms) appear to have been resilient to this biotic crisis, but the reason for their high survival rates is still unknown. Here we show that the growth performance of dinoflagellate cells germinated from resting stages is unaffected by up to a century of dormancy. Our results clearly indicate that phytoplankton resting stages can endure periods of darkness far exceeding those estimated for the Cretaceous-Paleogene extinction and may effectively aid the rapid resurgence of primary production in coastal areas after events of prolonged photosynthesis shut-down.

#### No impact to disease.

Gregg Easterbrook (a senior fellow at The New Republic) July 2003 “We're All Gonna Die!” http://www.wired.com/wired/archive/11.07/doomsday.html?pg=1&topic=&topic\_set=

Germ warfare!Like chemical agents, biological weapons have never lived up to their billing in popular culture. Consider the 1995 medical thriller Outbreak, in which a highly contagious virus takes out entire towns. The reality is quite different. Weaponized smallpox escaped from a Soviet laboratory in Aralsk, Kazakhstan, in 1971; three people died, no epidemic followed. In 1979, weapons-grade anthrax got out of a Soviet facility in Sverdlovsk (now called Ekaterinburg); 68 died, no epidemic. The loss of life was tragic, but no greater than could have been caused by a single conventional bomb. In 1989, workers at a US government facility near Washington were accidentally exposed to Ebola virus. They walked around the community and hung out with family and friends for several days before the mistake was discovered. No one died. The fact is, evolution has spent millions of years conditioning mammals to resist germs. Consider the Black Plague. It was the worst known pathogen in history, loose in a Middle Ages society of poor public health, awful sanitation, and no antibiotics. Yet it didn't kill off humanity. Most people who were caught in the epidemic survived. Any superbug introduced into today's Western world would encounter top-notch public health, excellent sanitation, and an array of medicines specifically engineered to kill bioagents. Perhaps one day some aspiring Dr. Evil will invent a bug that bypasses the immune system. Because it is possible some novel superdisease could be invented, or that existing pathogens like smallpox could be genetically altered to make them more virulent (two-thirds of those who contract natural smallpox survive), biological agents are a legitimate concern. They may turn increasingly troublesome as time passes and knowledge of biotechnology becomes harder to control, allowing individuals or small groups to cook up nasty germs as readily as they can buy guns today. But no superplague has ever come close to wiping out humanity before, and it seems unlikely to happen in the future.

#### CO2 fertilization is temporary and offset by negative climate effects.

J.L. Hatfield et. al, 2011, Laboratory Director, National Laboratory for Agriculture and the Environment, K.J. Boote, Agronomy Department, University of Florida, B.A. Kimball, USDA-ARS, U.S. Arid-Land Agricultural Research Center, L.H. Ziska, USDA Crop Systems and Global Change Laboratory, R.C. Izaurralde, Joint Global Change Research Institute, Pacific Northwest National Laboratory, University of Maryland, D.R. Ort, USDA/ARS, Photosynthesis Research Unit, University of Illinois, A. M. Thomson, Joint Global Change Research Institute, Pacific Northwest National Laboratory, University of Maryland, and David W. Wolfe, Department of Horticulture, Cornell University, “Climate Impacts on Agriculture: Implications for Crop Production,” Agronomy Journal, Vol. 103, Issue 2

Climate change, either as increasing trends in temperature, CO2, precipitation (decreasing as well as increasing), and/or O3, will have impacts on agricultural systems. Production of annual and perennial crops will be affected by changes in the absolute values of these climatic variables and/or increased variation. Episodic temperature changes exceeding the thresholds during the pollination stage of development could be quite damaging to crop production because of the sensitivity of crop plants to temperature extremes during this growth stage. These changes coupled with variable precipitation that places the plant under conditions of water stress would exacerbate the temperature effects. Warmer temperatures during the night, especially during the reproductive period, will reduce fruit or grain size because the rapid rate of development and increased respiration rates. A recent analysis by Ko et al. (2010), using the CERES–Wheat 4.0 module in the RZWQM2 model, evaluated the interactions of increasing CO2 obtained from a FACE experiment along with temperature, water, and N. They found the effects of water and N were greater than CO2 effects on biomass and yield and that temperature effects offset the CO2 effects. These results further confirm the concept that there are counterbalancing effects from different cli- mate variables and that development of adaptation or mitigation strategies will have to account for the combined effects of climate variables on crop growth, development, and yield. In an effort to examine potential solutions to low yields in sub-Saharan Africa, Laux et al. (2010) evaluated planting dates under climate change scenarios to evaluate the effect of increasing CO2 and higher temperature on groundnut (peanut) and maize. They found the positive effect of CO2 would offset the temperature response in the next 10 to 20 yr but would be overcome by higher temperatures by 2080. Changing planting dates were beneficial for the driest locations because of the more effective use of precipitation and avoidance of high temperature stresses. Both of these types of analyses will have to be conducted to evaluate potential adapta- tion strategies for all cropping regions. Increases in CO2 concentrations offer positive impacts to plant growth and increased WUE. However, these positive impacts may not fully mitigate crop losses associated with heat stress, increases in evaporative demand, and/or decreases in water availability in some regions. The episodic variation in extremes may become the larger impact on plant growth and yield. To counteract these effects will require management systems that offer the largest degree of resilience to climatic stresses as possible. This will include the development of man- agement systems for rainfed environments that can store the maximum amount of water in the soil profile and reduce water stress on the plant during critical growth periods.