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### Based Islands Advantage

#### #BASED ISLANDS ADVANTAGE

#### Cyber attack imminent and feasible – probing proves actors are in the staging steps – reverse engineer of Stuxnet likely

Reed 12 (John, national security reporter for Foreign Policy, University of New Hampshire with a dual degree in international affairs and history, "U.S. energy companies victims of potentially destructive cyber intrusions," Oct 11, [killerapps.foreignpolicy.com/posts/2012/10/11/us\_energy\_companies\_victims\_of\_potentially\_destructive\_cyber\_attacks])

Foreign actors are probing the networks of key American companies in an attempt to gain control of industrial facilities and transportation systems, Defense Secretary Leon Panetta revealed tonight. "We know that foreign cyber actors are probing America's critical infrastructure networks," said Panetta, disclosing previously classified information during a speech in New York laying out the Pentagon's role in protecting the U.S. from cyber attacks. "They are targeting the computer control systems that operate chemical, electricity and water plants, and those that guide transportation thorough the country." He went on to say that the U.S. government knows of "specific instances where intruders have gained access" to these systems -- frequently known as Supervisory Control and Data Acquisition (or SCADA) systems -- and that "they are seeking to create advanced tools to attack these systems and cause panic, destruction and even the loss of life," according to an advance copy of his prepared remarks. The secretary said that a coordinated attack on enough critical infrastructure could be a "cyber Pearl Harbor" that would "cause physical destruction and loss of life, paralyze and shock the nation, and create a profound new sense of vulnerability." While there have been reports of criminals using 'spear phishing' email attacks aimed at stealing information about American utilties, Panetta's remarks seemed to suggest more sophisticated, nation-state backed attempts to actually gain control of and damage power-generating equipment. Panetta's comments regarding the penetration of American utilities echo those of a private sector cyber security expert Killer Apps spoke with last week who said that the networks of American electric companies were penetrated, perhaps in preparation for a Stuxnet-style attack. Stuxnet is the famous cyber weapon that infected Iran's uranium-enrichment centrifuges in 2009 and 2010. Stuxnet is believed to have caused some of the machines to spin erratically, thereby destroying them. "There is hard evidence that there has been penetration of our power companies, and given Stuxnet, that is a staging step before destruction" of electricity-generating equipment, the expert told Killer Apps. Because uranium centrifuges and power turbines are both spinning machines, "the attack is identical -- the one to take out the centrifuges and the one to take out our power systems is the same attack." "If a centrifuge running at the wrong speed can blow apart" so can a power generator, said the expert. "If you do, in fact, spin them at the wrong speeds, you can blow up any rotating device." Cyber security expert Eugene Kaspersky said two weeks ago that one of his greatest fears is someone reverse-engineering a sophisticated cyber weapon like Stuxnet -- a relatively easy task -- and he noted that Stuxnet itself passed through power plants on its way to Iran. "Stuxnet infected thousands of computer systems all around the globe, I know there were power plants infected by Stuxnet very far away from Iran," Kaspersky said. While the utilities have been penetrated, Panetta said that the Defense Department, largely via the National Security Agency, is "acting aggressively to get ahead of this problem -- putting in place measures to stop cyber attacks dead in their tracks" under a whole-of-government effort. The Department of Homeland Security, working with the Department of Energy, has the lead in responding to the attacks that Panetta disclosed tonight, senior defense officials told reporters during a background briefing about Panetta's speech. The Pentagon officials believe they know who was behind the attack but would not reveal who that may be. They did note however, that Russia, China, and increasingly, Iran have developed worrisome cyber capabilities. DHS officials were not available for comment. Panetta added that the Pentagon stands ready to "counter" cyber threats to U.S. national interests. He did not, however, use the word "offensive" to describe any of DoD's operations in cyberspace. "If we detect an imminent threat of attack that will cause significant physical destruction or kill American citizens, we need to have the option to take action to defend the nation when directed by the President," said Panetta. "For these kinds of scenarios, the [Defense Department] has developed that capability to conduct effective operations to counter threats to our national interests in cyberspace."

#### Civilian grid blackouts wreck national command authority, fracture global military operations, collapse deterrence, and escalate to nuclear war—vulnerability independently invites cyber-attacks

Andres & Breetz 11 (Richard B., Professor of national Security Strategy at the national War College and a Senior fellow and energy and environmental Security and Policy Chair in the Center for Strategic research, institute for national Strategic Studies, at the national Defense University, Hanna L., doctoral candidate in the Department of Political Science at the Massachusetts institute of technology, "Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications," February 2011, [www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf], jam)

Grid Vulnerability. DOD is unable to provide its bases with electricity when the civilian electrical grid is offline for an extended period of time. Currently, domestic military installations receive 99 percent of their electricity from the civilian power grid. As explained in a recent study from the Defense Science Board: DOD’s key problem with electricity is that critical missions, such as national strategic awareness and national command authorities, are almost entirely dependent on the national transmission grid . . . [which] is fragile, vulnerable, near its capacity limit, and outside of DOD control. In most cases, neither the grid nor on-base backup power provides sufficient reliability to ensure continuity of critical national priority functions and oversight of strategic missions in the face of a long term (several months) outage. 7 The grid’s fragility was demonstrated during the 2003 Northeast blackout in which 50 million people in the United States and Canada lost power, some for up to a week, when one Ohio utility failed to properly trim trees. The blackout created cascading disruptions in sewage systems, gas station pumping, cellular communications, border check systems, and so forth, and demonstrated the interdependence of modern infrastructural systems. 8 More recently, awareness has been growing that the grid is also vulnerable to purposive attacks. A report sponsored by the Department of Homeland Security suggests that a coordinated cyberattack on the grid could result in a third of the country losing power for a period of weeks or months. 9 Cyberattacks on critical infrastructure are not well understood. It is not clear, for instance, whether existing terrorist groups might be able to develop the capability to conduct this type of attack. It is likely, however, that some nation-states either have or are working on developing the ability to take down the U.S. grid. In the event of a war with one of these states, it is possible, if not likely, that parts of the civilian grid would cease to function, taking with them military bases located in affected regions. Government and private organizations are currently working to secure the grid against attacks; however, it is not clear that they will be successful. Most military bases currently have backup power that allows them to function for a period of hours or, at most, a few days on their own. If power were not restored after this amount of time, the results could be disastrous. First, military assets taken offline by the crisis would not be available to help with disaster relief. Second, during an extended blackout, global military operations could be seriously compromised; this disruption would be particularly serious if the blackout was induced during major combat operations. During the Cold War, this type of event was far less likely because the United States and Soviet Union shared the common understanding that blinding an opponent with a grid blackout could escalate to nuclear war. America’s current opponents, however, may not share this fear or be deterred by this possibility.

#### Loss of national command authority and cyber attack causes miscalc and extinction

Lawson 9 (Sean - assistant professor in the Department of Communication at the University of Utah, Cross-Domain Response to Cyber Attacks and the Threat of Conflict, 5/13, http://www.seanlawson.net/?p=477)

At a time when it seems impossible to avoid the seemingly growing hysteria over the threat of cyber war,[1] network security expert Marcus Ranum delivered a refreshing talk recently, “The Problem with Cyber War,” that took a critical look at a number of the assumptions underlying contemporary cybersecurity discourse in the United States. He addressed one issue in partiuclar that I would like to riff on here, the issue of conflict escalation–i.e. the possibility that offensive use of cyber attacks could escalate to the use of physical force. As I will show, his concerns are entirely legitimate as current U.S. military cyber doctrine assumes the possibility of what I call “cross-domain responses” to cyberattacks. Backing Your Adversary (Mentally) into a Corner Based on the premise that completely blinding a potential adversary is a good indicator to that adversary that an attack is iminent, Ranum has argued that “The best thing that you could possibly do if you want to start World War III is launch a cyber attack. [...] When people talk about cyber war like it’s a practical thing, what they’re really doing is messing with the OK button for starting World War III. We need to get them to sit the f-k down and shut the f-k up.” [2] He is making a point similar to one that I have made in the past: Taking away an adversary’s ability to make rational decisions could backfire. [3] For example, Gregory Witol cautions that “attacking the decision maker’s ability to perform rational calculations may cause more problems than it hopes to resolveÃ¢â‚Â¦ Removing the capacity for rational action may result in completely unforeseen consequences, including longer and bloodier battles than may otherwise have been.” [4] Ã¯Â»Â¿Cross-Domain Response So, from a theoretical standpoint, I think his concerns are well founded. But the current state of U.S. policy may be cause for even greater concern. It’s not just worrisome that a hypothetical blinding attack via cyberspace could send a signal of imminent attack and therefore trigger an irrational response from the adversary. What is also cause for concern is that current U.S. policy indicates that “kinetic attacks” (i.e. physical use of force) are seen as potentially legitimate responses to cyber attacks. Most worrisome is that current U.S. policy implies that a nuclear response is possible, something that policy makers have not denied in recent press reports. The reason, in part, is that the U.S. defense community has increasingly come to see cyberspace as a “domain of warfare” equivalent to air, land, sea, and space. The definition of cyberspace as its own domain of warfare helps in its own right to blur the online/offline, physical-space/cyberspace boundary. But thinking logically about the potential consequences of this framing leads to some disconcerting conclusions. If cyberspace is a domain of warfare, then it becomes possible to define “cyber attacks” (whatever those may be said to entail) as acts of war. But what happens if the U.S. is attacked in any of the other domains? It retaliates. But it usually does not respond only within the domain in which it was attacked. Rather, responses are typically “cross-domain responses”–i.e. a massive bombing on U.S. soil or vital U.S. interests abroad (e.g. think 9/11 or Pearl Harbor) might lead to air strikes against the attacker. Even more likely given a U.S. military “way of warfare” that emphasizes multidimensional, “joint” operations is a massive conventional (i.e. non-nuclear) response against the attacker in all domains (air, land, sea, space), simultaneously. The possibility of “kinetic action” in response to cyber attack, or as part of offensive U.S. cyber operations, is part of the current (2006) National Military Strategy for Cyberspace Operations [5]: (U) Kinetic Actions. DOD will conduct kinetic missions to preserve freedom of action and strategic advantage in cyberspace. Kinetic actions can be either offensive or defensive and used in conjunction with other mission areas to achieve optimal military effects. Of course, the possibility that a cyber attack on the U.S. could lead to a U.S. nuclear reply constitutes possibly the ultimate in “cross-domain response.” And while this may seem far fetched, it has not been ruled out by U.S. defense policy makers and is, in fact, implied in current U.S. defense policy documents. From the National Military Strategy of the United States (2004): “The term WMD/E relates to a broad range of adversary capabilities that pose potentially devastating impacts. WMD/E includes chemical, biological, radiological, nuclear, and enhanced high explosive weapons as well as other, more asymmetrical ‘weapons’. They may rely more on disruptive impact than destructive kinetic effects. For example, cyber attacks on US commercial information systems or attacks against transportation networks may have a greater economic or psychological effect than a relatively small release of a lethal agent.” [6] The authors of a 2009 National Academies of Science report on cyberwarfare respond to this by saying, “Coupled with the declaratory policy on nuclear weapons described earlier, this statement implies that the United States will regard certain kinds of cyberattacks against the United States as being in the same category as nuclear, biological, and chemical weapons, and thus that a nuclear response to certain kinds of cyberattacks (namely, cyberattacks with devastating impacts) may be possible. It also sets a relevant scale–a cyberattack that has an impact larger than that associated with a relatively small release of a lethal agent is regarded with the same or greater seriousness.” [7]

#### SMRs efficiently island bases from grid failure—deters by denial

Andres & Breetz 11 (Richard B., Professor of national Security Strategy at the national War College and a Senior fellow and energy and environmental Security and Policy Chair in the Center for Strategic research, institute for national Strategic Studies, at the national Defense University, Hanna L., doctoral candidate in the Department of Political Science at the Massachusetts institute of technology, "Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications," February 2011, [www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf], jam)

In 2008, the Defense Science Board stressed that DOD should mitigate the electrical grid’s vulnerabilities by turning military installations into “islands” of energy self-sufficiency. 10 The department has made efforts to do so by promoting efficiency programs that lower power consumption on bases and by constructing renewable power generation facilities on selected bases. Unfortunately, these programs will not come close to reaching the goal of islanding the vast majority of bases. Even with massive investment in efficiency and renewables, most bases would not be able to function for more than a few days after the civilian grid went offline. Unlike other alternative sources of energy, small reactors have the potential to solve DOD’s vulnerability to grid outages. Most bases have relatively light power demands when compared to civilian towns or cities. Small reactors could easily support bases’ power demands separate from the civilian grid during crises. In some cases, the reactors could be designed to produce enough power not only to supply the base, but also to provide critical services in surrounding towns during long-term outages. Strategically, islanding bases with small reactors has another benefit. One of the main reasons an enemy might be willing to risk reprisals by taking down the U.S. grid during a period of military hostilities would be to affect ongoing military operations. Without the lifeline of intelligence, communication, and logistics provided by U.S. domestic bases, American military operations would be compromised in almost any conceivable contingency. Making bases more resilient to civilian power outages would reduce the incentive for an opponent to attack the grid. An opponent might still attempt to take down the grid for the sake of disrupting civilian systems, but the powerful incentive to do so in order to win an ongoing battle or war would be greatly reduced.

#### Thorium is the only energy capable of reliably supporting bases

Ackerman 11 (Spencer, senior reporter at Wired, "Latest Pentagon Brainstorm: Nuke-Powered War Bases," Feb 18, [www.wired.com/dangerroom/2011/02/nuke-bases/], jam)

Imagine the snow-capped peaks of mountainous eastern Afghanistan. Wouldn’t it be better topped off with a cooling tower for a nuclear reactor? The Pentagon’s way-out research arm thinks so. It’s all part of a big push to make the military more eco-friendly. Buried within Darpa’s 2012 budget request under the innocuous name of “Small Rugged Reactor Technologies” is a $10 million proposal to fuel wartime Forward Operating Bases with nuclear power. It springs from an admirable impulse: to reduce the need for troops or contractors to truck down roads littered with bombs to get power onto the base. It’s time, Darpa figures, for a “self-sufficient” FOB. Only one problem. “The only known technology that has potential to address the power needs of the envisioned self-sufficient FOB,” the pitch reads, “is a nuclear-fuel reactor.” Now, bases could mitigate their energy consumption, like the solar-powered Marine company in Helmand Province, but that’s not enough of a game-changer for Darpa. Being self-sufficient is the goal; and that requires going nuclear; and that requires … other things. To fit on a FOB, which can be anywhere from Bagram Air Field’s eight square miles to dusty collections of wooden shacks and concertina wire, the reactor would have to be “well below the scale of the smallest reactors that are being developed for domestic energy production,” Darpa acknowledges. That’s not impossible, says Christine Parthemore, an energy expert at the Center for a New American Security. The Japanese and the South Africans have been working on miniature nuclear power plants for the better part of a decade; Bill Gates has partnered with Toshiba to build mini-nuke sites. (Although it’s not the most auspicious sign that one prominent startup for modular reactors suspended its operations after growing cash-light last month.) Those small sites typically use uranium enriched to about 2 percent. “It would be really, really difficult to divert the fuel” for a bomb “unless you really knew what you were doing,” Parthemore says. But Darpa doesn’t want to take that chance. Only “non-proliferable fuels (i.e., fuels other than enriched uranium or plutonium) and reactor designs that are fundamentally safe will be required of reactors that may be deployed to regions where hostile acts may compromise operations.” Sensible, sure. But it limits your options: outside of uranium or plutonium, thorium is the only remaining source for generating nuclear fuel. The Indians and now the Chinese have experimented with thorium for their nuclear programs, but, alas, “no one has ever successfully found a way” to build a functioning thorium reactor, Parthemore says, “in a safe and economical manner.” For now, Darpa proposes to spend $10 million of your money studying the feasibility of the project. But it’s just one part of the researchers’ new push to green the military. Another $10 million goes to a project called Energy Distribution, which explores bringing down energy consumption on the FOBs. An additional $5 million will look at ways to keep fuel storage from degrading in extreme temperatures. For $50 million, Darpa proposes to build a turbine engine that uses 20 percent less energy. But all of that is mere isotopes compared to the Nuclear FOB. Darpa appears to have thought about it a lot. It says it plans to work with the Department of Energy “to ensure that existing advanced reactor development activities are being exploited and/or accelerated as appropriate, based on the military’s needs.” Still, if it can’t find the right non-proliferable fuel, it suggests that it might look to the “development of novel fuels.” Says a stunned Parthemore, “I have no idea why you’d want to bring that upon the world.”

### Prolif Advantage

#### PROLIF ADVANTAGE

#### Scenario 1 is terrorism

#### Russia has dropped out of Nunn-Lugar – without reprocessing, vulnerable fissile material will find its way into the hands of terrorists causing extinction – Russia needs a new, independent, cost-effective program

NYT 10/17 ("Mr. Putin’s Gift to Terrorists," 2012, NYTimes Editorial Board, [www.nytimes.com/2012/10/18/opinion/vladimir-putins-gift-to-terrorists.html?\_r=1&], jam)

There will be plenty of losers from Russia’s recent decision to end two decades of cooperation with Washington on cleaning up nuclear and chemical weapons sites left over from the cold war. Russia will now have to pay for such efforts on its own. The United States will lose the most cost-effective way yet found for reducing nuclear dangers. And the world must watch as Russia’s unsecured weapons and materials remain a temptation for terrorists of all varieties to buy or steal for use in future attacks. The cooperative threat reduction program Russia wants to walk away from next spring is the heart of the so-called Nunn-Lugar initiative, which was passed by Congress in 1991. This range of programs provides American money and expertise to countries of the former Soviet Union to help them eliminate or secure vulnerable nuclear and chemical weapons, materials and sites. Over the past two decades, they have helped deactivate more then 7,600 nuclear warheads, destroy more than 2,000 nuclear capable missiles, convert more than 400 metric tons of highly enriched uranium bomb fuel into low-enriched reactor fuel and destroyed large stockpiles of chemical weapons. This has cost the American taxpayer less than $15 billion over the 20-year life of the program, far less than the Pentagon spends each year for defense and deterrence against nuclear attack. But the job remains barely half-done. Cutting off this successful program now is perverse and reckless — and all too typical of President Vladimir Putin’s sour, xenophobic and self-isolating worldview. Last month, he expelled the United States Agency for International Development, which has sponsored human rights, civil society and public health programs since the fall of communism. Perhaps those civil society programs proved too successful — and too threatening to Mr. Putin — for their own survival. But the nuclear cleanup program affects everyone’s survival. The official explanation for ending them is based on national pride — the wish to proclaim that Russia can take care of these issues by itself, without American help. Another may be Moscow’s reflexive desire to be shielded from foreign eyes that might see things President Putin and his military commanders do not want them to see. Paranoia and xenophobia in the Kremlin predates communism and has now outlasted it by more than two decades. If Moscow lets the cooperative program lapse, it needs to replace it with adequately financed Russian programs. The continuing cleanup must be transparent enough to earn the world’s trust. Currently, that confidence comes from the participation of American contractors in the cleanup work. Maintaining it without them will not be easy. But Mr. Putin, having created that problem, must now solve it.

#### START means there is a lot of new vulnerable fissile material – Russia won’t deal with it

Diakov 12 (Anatoli, Center for Arms Control, Energy and Environmental Studies, "Disposition of Excess Russian Weapon HEU and Plutonium," Feb, [www.unidir.org/pdf/ouvrages/pdf-1-92-9045-012-D-en.pdf], jam)

There is no public indication that Russia has set specific requirements for the quantities of weapons-grade fissile materials that it needs for its weapons arsenal and for future naval reactor use. That makes it difficult to estimate how much additional HEU and weapons-grade plutonium might be declared excess as a result of further reductions in Russia’s warhead stocks. If Russia and the United States each reduced their stocks of deployed nuclear warheads as established by the New START treaty to the level of 1,550, that could free up hundreds of tons of additional material for disposition. It is unlikely, however, that Russia will continue any version of the US–Russian HEU Purchase Agreement after it expires in 2013. The Russian Federal Atomic Agency chief Sergei Kirienko has indicated that Russia will not continue the programme after 2013. 10 With its economy growing and greatly increased federal funding for the nuclear sector, Russia does not need revenue from the HEU deal in the way it did in the early 1990s. Moreover, the way the deal is currently implemented makes it less profitable for Russia than simply marketing enrichment services commercially. Also, some experts believe that sales of an enrichment service is more important to Rosatom than uranium sales. Russia wants to get commercial access to the US enrichment market after 2013. While Russian sales of enrichment services to the United States are currently blocked, under the HEU–LEU deal Russia supplied about 5.5 million separative work units (SWU) per year to the United States—that is 44% of the US utility requirements. 11 After 2013 Rosatom would like to have 20–25% of the US SWU market and it needs assurances that US trade laws will not be used to block Rosatom SWU sales in the United States.

#### Nuclear terrorism is inevitable absent fissile material disposal and Russia is the most likely candidate for theft—Bin Laden was only the beginning—expert consensus

Smith 11 (James F., Communications Director, Belfer Center for Science and International Affairs, Jun 6, [www.nti.org/newsroom/news/first-joint-us-russia-assessment/], jam)

Researchers from the United States and Russia today issued a joint assessment of the global threat of nuclear terrorism, warning of a persistent danger that terrorists could obtain or make a nuclear device and use it with catastrophic consequences. The first joint threat assessment by experts from the world’s two major nuclear powers concludes: “If current approaches toward eliminating the threat are not replaced with a sense of urgency and resolve, the question will become not if but when, and on what scale, the first act of nuclear terrorism occurs.” The study recommends measures to tighten security over existing nuclear weapons and the nuclear materials terrorists would need to make a crude nuclear bomb, along with expanded police and intelligence cooperation to interdict nuclear smuggling and stop terrorist nuclear plots. The report also calls for improved protection of nuclear facilities that might be sabotaged, and of radiological materials that might be used in a dirty bomb. The report, titled "The U.S.-Russia Joint Threat Assessment on Nuclear Terrorism," released on Monday, June 6, in Cambridge, Mass., and in Moscow, results from a nearly year-long partnership by nuclear security experts from the Belfer Center for Science and International Affairs at Harvard Kennedy School and The Institute for U.S. and Canadian Studies in Moscow, a leading Russian research center. The lead U.S. and Russian authors are Rolf Mowatt-Larssen, a senior fellow in the Belfer Center and a former director of intelligence and counter-intelligence at the U.S. Department of Energy, and Pavel S. Zolotarev, a retired army general who is deputy director of Moscow’s Institute for U.S. and Canadian Studies, at the Russian Academy of Sciences, and former head of the Information and Analysis Center of the Russian Ministry of Defense. “ If you look at the U.S. and Russia together, we own about 90% of the problem – more of the weapons, less of the nuclear materials. So it’s only right that these two countries share their expertise and look hard at ways to work together to lower the risks,” said Mowatt-Larssen. “The United States and Russia have never produced a document that could be said to represent a common understanding of the nuclear terrorism threat. This can now be used as a basis for driving action in both governments.” Zolotarev said: "Russia and the United States have paid more attention to nuclear weapons and nuclear deterrence, even though neither of our two countries has a political need to rely threat of nuclear terrorism, which constitutes a more real threat than the enormous arsenals of nuclear weapons in both countries. The threat of nuclear terrorism is increasing. Our response should anticipate the dynamics of the threat rather than lag behind it." The researchers’ joint assessment was reviewed and endorsed by a group of retired U.S. and Russian senior military and intelligence officers, led by General Anatoliy S. Kulikov (former Minister of Interior) and General Eugene E. Habiger (former STRATCOM commander). This “Elbe Group” was established in October 2010 to create an informal communication channel on security issues of concern to both the United States and Russia. The Joint Threat Assessment was coordinated by the Kennedy School’s U.S.-Russia Initiative to Prevent Nuclear Terrorism, which is directed by William Tobey, a senior fellow in the BelferCenter and former top official in the National Nuclear Security Administration. The assessment project was supported by the Nuclear Threat Initiative, a non-profit organization in Washington that works to reduce threats from nuclear, chemical and biological weapons. “The joint threat assessment accomplishes something that so far governments have been unable to do: gauge the threat of nuclear terrorism from differing national perspectives, and thereby form the basis for effective action to defeat it,” said Tobey. “This will help to overcome the number one barrier to improved nuclear security--complacency." Key Findings The joint assessment examines potential terrorist pathways to a nuclear attack, among them buying or stealing an existing weapon, or getting highly enriched uranium or plutonium and fashioning a crude nuclear bomb of their own, which the study warns is distressingly plausible. It also concludes that while the killing of Osama bin Laden damages al Qaeda’s capacity to carry out nuclear terrorism, surviving leaders of the group retain nuclear terror ambitions. The joint report documents that al Qaeda has been working for years to acquire the nuclear materials and expertise needed to make a crude nuclear bomb, getting as far as carrying out explosive tests for their nuclear program in the Afghan desert. The report outlines the steps terrorists could follow and envisions how a terrorist nuclear plot might be structured – and how countries should work together to stop it. The study notes that in addition to al Qaeda, terrorists from the North Caucasus region remain committed to carrying out catastrophic attacks, have carried out reconnaissance at nuclear weapon storage sites, have plotted to hijack a nuclear submarine with nuclear weapons on board, have planted radiological materials in Moscow, and have repeatedly threatened to attack nuclear power plants. These groups include factions in Chechnya, Dagestan, Ingushetia and elsewhere. Among the joint assessment’s recommendations: All stocks of nuclear weapons, highly enriched uranium and plutonium must be protected against all plausible terrorist and criminal threats, and the number of locations where these stocks exist must be reduced as much as practicable. Coordinated U.S.-Russian leadership is vital for this international effort because the two countries hold the largest nuclear stockpiles and are most experienced in dealing with nuclear security. This joint effort should promote and support enhanced intelligence and law enforcement by UN, the International Atomic Energy Agency, and international police organizations.

#### Assume a high risk of nuclear attack – it is too easy to steal weapons grade material

Tirone ‘12 (Jonathan, reporter for Bloomberg News, 3/22/2012, "Missing Nukes Fuel Terror Concern," [www.businessweek.com/news/2012-03-22/missing-nukes-fuel-terror-concern-as-seoul-meeting-draws-obama#p1], jam)

A nuclear-armed terrorist attack on the U.S. port in Long Beach, California, would kill 60,000 people and cost as much as $1 trillion in damage and cleanup, according to a 2006 Rand study commissioned by the Department of Homeland Security. Even a low-level radiological or dirty-bomb attack on Washington, while causing a limited number of deaths, would lead to damages of $100 billion, according to Igor Khripunov, the Soviet Union’s former arms-control envoy to the U.S. He is now at the Athens, Georgia-based Center for International Trade and Security. Because a terrorist needs only about 25 kilograms of highly-enriched uranium or 8 kilograms of plutonium to improvise a bomb, the margin of error for material accounting is small. There are at least 2 million kilograms (4.4 million pounds) of stockpiled weapons-grade nuclear material left over from decommissioned bombs and atomic-fuel plants, according to the International Panel on Fissile Materials, a nonprofit Princeton, New Jersey research institute that tracks nuclear material. That’s enough to make at least 100,000 new nuclear weapons on top of the 20,000 bombs already in weapon-state stockpiles. ‘Poorly Secured’ “The elements of a perfect storm are gathering,” said former Democratic Senator Sam Nunn, founder of the Washington- based Nuclear Threat Initiative, in an e-mail. “There is a large supply of plutonium and highly enriched uranium-weapons- usable nuclear materials spread across hundreds of sites in 32 countries, too much of it poorly secured. There is also greater know-how to build a bomb widely available, and there are terrorist organizations determined to do it.” Greenpeace, the anti-nuclear environmental group, has shown the ease with which intruders could breach security at Electricite de France SA reactors. Activists on Dec. 5 exposed lapses at EDF nuclear reactors near Paris and in southern France, hiding inside one for 14 hours and unfurling a banner reading “Safe Nuclear Doesn’t Exist” on the roof of another. Invading Power Plants Since then, EDF has reviewed existing barriers around reactor sites and added patrols with guard dogs and tasers, said Dominique Miniere, the company’s director of nuclear production. If saboteurs were to penetrate a reactor site and disable the power supply, creating a similar effect as when the tsunami struck the Fukushima Dai-Ichi plant in Japan last year, there would be a danger of the nuclear fuel rods melting and radioactive particles being released into the air. Criminals breached South Africa’s Pelindaba nuclear facility in 2007, overpowering guards who oversaw the country’s stock of bomb-grade material. The U.S. Defense Threat Reduction Agency dismissed staff over nuclear security concerns in May 2008 at a North Dakota base that dispatched nuclear bombs without proper controls. In November 2010, Belgian activists evaded North Atlantic Treaty Organization guards to expose weak security protecting nuclear weapons at a base in Kleine Brogel. Activists spent several hours taking pictures of a bunker containing nuclear warheads before security guards apprehended them. The Global Zero Initiative, whose U.S. arm is headed by former nuclear negotiator Richard Burt, said in a report last month that the greatest nuclear security threat in Russia comes from bases in the country’s west that house tactical nuclear warheads targeting Europe. These bases provide inadequate security against theft or sabotage, according to the report, whose authors included Russian former arms-control negotiators. At the end of the Cold War, the Soviet Union had about 22,000 nuclear weapons in storage in Russia and such satellite states as Armenia, Belarus, Kazakhstan and Ukraine. Allison says there are doubts that all the weapons-usable material was recovered when many warheads were repatriated and dismantled because of the chaos at the time and incomplete records. About 100 grams of highly enriched uranium, lodged inside a nuclear fission chamber, was plucked out of a Rotterdam scrap- metal yard in 2009 by Jewometaal Stainless Processing BV’s radiation-safety chief, Paul de Bruin. The scrap probably came from a decommissioned Soviet nuclear facility, he said. Low Detection Chance The discovery illustrated the ease with which nuclear material can bypass accounting checks and international radiation monitors. The shipment containing the uranium had already been checked for radioactivity. “The inability to accurately account for weapon-usable nuclear material around the world is a major obstacle to eliminating the threat of nuclear terrorism,” said Edwin Lyman, a senior physicist at the Cambridge, Massachusetts-based Union for Concerned Scientists, on March 14. Plutonium can be smuggled from some facilities “without a high probability of detection,” he said. One issue threatening to hobble the security summit is that all nations aren’t invited, wrote Burt, who is also a managing director at Washington’s McLarty Associates. He negotiated nuclear-weapons cuts with the Soviets under President George H.W. Bush. IAEA Role Other countries that weren’t invited include Belarus, home to about 500 pounds of high-enriched uranium that the U.S. wants removed, and Niger, the West African nation falsely accused of supplying uranium to Iraq before the 2003 war over an alleged nuclear-weapons program. Organizers opted to keep participation narrow in 2010 to foster more substantive debate, South Korea’s International Atomic Energy Agency envoy, Cho Hyun, said in a March 15 interview. By excluding some nuclear nations from the proceedings, the summit organizers risk undercutting the role of the Vienna-based IAEA, which verifies nuclear material worldwide. “The summit’s lack of universality affects the ability of the IAEA to take a visible role in nuclear security,” said Cho, who was previously South Korea’s chief negotiator for U.S. nuclear agreements. “The IAEA has been playing an essential role in strengthening international efforts for nuclear security.” Not Yet? The 153-member IAEA, whose powers are granted by consensus, has published guides and helped install detection equipment, in addition to making sure fissile material isn’t diverted for weapons in places like Iran. Lebanon asked the Vienna-based agency in 2008 to help install radiation monitors in Masnaa, along its border with Syria. “Nuclear security is a global issue and it requires a global response,” IAEA spokeswoman Gill Tudor said today in an e-mail, adding that the agency’s security budget will need to grow in order for it to help member states. “The need to improve nuclear security greatly exceeds inflation.” In the absence of binding oversight or an international verification treaty, Harvard’s Allison said he was surprised terrorists haven’t already used nuclear materials in an attack. “There is general agreement in national security circles that” a dirty bomb attack “is long overdue,” he said. “Terrorists have known for a long time that nuclear reactors are potentially vulnerable to attack or sabotage.” Other officials say the threat of nuclear terrorism should be taken seriously without being overplayed in public. “Those of us who are ringing the nuclear terrorism alarm take care to not overstate the odds of such an attack,” former U.S. Energy Department Director of Intelligence Rolf Mowatt- Larssen wrote March 18 in an e-mail. “The population is also suffering from terror-warning fatigue.” “Governments are only now beginning to think about how to raise nuclear security standards worldwide,” Washington-based Arms Control Association President Daryl Kimball said March 14. “Terrorists only need to exploit the weakest link in order to acquire nuclear material that could eventually lead to a detonation that would make the Fukushima disaster pale in comparison.”

#### Terrorism causes global nuclear escalation – national retaliation goes global

Morgan ‘9 (Dennis Ray, Professor of Foreign Studies at Hankuk University, December, “World on fire: two scenarios of the destruction of human civilization and possible extinction of the human race” Futures, Vol 41 Issue 10, p 683-693, ScienceDirect) ORIGINALLY CUT BY MATT GOMEZ FOR THE SCUFI. THANKS, MATT.

In a remarkable website on nuclear war, Carol Moore asks the question "Is Nuclear War Inevitable??" [10].4 In Section 1, Moore points out what most terrorists obviously already know about the nuclear tensions between powerful countries. No doubt, they've figured out that the best way to escalate these tensions into nuclear war is to set off a nuclear exchange. As Moore points out, all that militant terrorists would have to do is get their hands on one small nuclear bomb and explode it on either Moscow or Israel. Because of the Russian "dead hand" system, "where regional nuclear commanders would be given full powers should Moscow be destroyed," it is likely that any attack would be blamed on the United States" [10]. Israeli leaders and Zionist supporters have, likewise, stated for years that if Israel were to suffer a nuclear attack, whether from terrorists or a nation state, it would retaliate with the suicidal "Samson option" against all major Muslim cities in the Middle East. Furthermore, the Israeli Samson option would also include attacks on Russia and even "anti-Semitic" European cities [10]. In that case, of course, Russia would retaliate, and the U.S. would then retaliate against Russia. China would probably be involved as well, as thousands, if not tens of thousands, of nuclear warheads, many of them much more powerful than those used at Hiroshima and Nagasaki, would rain upon most of the major cities in the Northern Hemisphere. Afterwards, for years to come, massive radioactive clouds would drift throughout the Earth in the nuclear fallout, bringing death or else radiation disease that would be genetically transmitted to future generations in a nuclear winter that could last as long as a 100 years, taking a savage toll upon the environment and fragile ecosphere as well.

#### Thorium reactors can’t produce weapons grade waste – stymies proliferation

Donohue 8/17 (Nathan, George Washington University, Elliott School of International Affairs, research intern for the Project on Nuclear Issues, Center for Strategic and International Studies, 2012, "Thorium and its Value in Nonproliferation," [csis.org/blog/thorium-and-its-value-nonproliferation], jam)

The Federation of American Scientists (FAS) recently featured an article on their Science Wonk blog entitled “What about thorium?” As the article discussed, thorium is an element, which like uranium, has the ability to be utilized to produce nuclear power. More importantly, thorium fueled reactors are reported to be more proliferation resistant than uranium fueled reactors. However, despite these assertions, thorium has almost universally been ignored in favor of uranium based nuclear power reactors. The purpose of this piece is to conduct a review of thorium and to develop a better understanding of thorium’s nonproliferation benefits as it relates to nuclear power production. As FAS notes, natural thorium is a fertile material, while not itself fissionable, can be converted into a fissile material suitable to sustain a nuclear fission chain reaction. Accordingly, when natural thorium captures neutrons it becomes a new isotope of thorium which then goes through a process of decay where over a period of weeks, the thorium actually turns into uranium in the form of U-233. Unlike natural thorium, this U-233 is a fissile material suitable to sustain a nuclear fission chain reaction. The use of thorium to produce nuclear power is not a new concept. Research into thorium began in the late 1950’s and in 1965, Alvin Weinberg, the head of the Oak Ridge National Laboratory, and his team built a working thorium reactor using a molten salt bath design. Thorium was used to power one of the first commercial nuclear power plants in the U.S. in Shippingport, Pennsylvania in 1977. Nevertheless, research into thorium never found a foothold in the U.S. nuclear power infrastructure. By 1973, thorium research and development was fading to the uranium based focus of the U.S. nuclear industry, which was in the process of developing 41 new nuclear plants, all of which used uranium. The Shippingport facility was one of the last vestiges of thorium research in the U.S. for decades. Recently there has been a renewed focus on thorium based nuclear power, specifically in regards to the benefits related to spent fuel, including research involving the European Commission, India, Canada, Slovakia, the Russian Federation, China, France and the Republic of Korea. The utilization of thorium is purported to have the ability to reduce spent fuel waste by upwards of 50% while at the same time reducing the amount of plutonium within the fuel. To that end, thorium fuel designs are regarded as a better alternative for power production in terms of the plutonium proliferation risk inherent in spent fuel from uranium-fueled reactors. For example, all 104 reactors in the U.S. use uranium fuel. In these reactors, when the uranium in the form of U-238 captures extra neutrons, it goes through a process of decay whereby plutonium in the form of Pu-239 is produced. The spent fuel can then be reprocessed to isolate and remove this plutonium, which can then be used in the core of a nuclear weapon. Roughly 13 kilograms (kg) of reactor grade plutonium is necessary to power a nuclear weapon. In total, these 104 U.S. reactors accumulate roughly 2,000 tons of spent fuel per year. The 2,000 tons of waste produced annually by these nuclear utilities, contains roughly 25,520 kg of plutonium or enough plutonium to build 1,963 nuclear weapons a year. Globally, the total world generation of reactor-grade plutonium in spent fuel is equal to roughly 70 tons annually; more than two times what the U.S. produces. Conversely, there is the thorium seed and blanket design. This reactor concept is based on a design comprised of inner seed rods of uranium which provide neutrons to an outer blanket of thorium-uranium dioxide rods, creating U-233, which in turn powers the nuclear reactor. The important difference with this design is in the nature of the spent fuel. As advocates of thorium such as the U.S. company Lightbridge purport, this process would realize a significant reduction in the “quantity and quality” of plutonium produced within the spent fuel, achieving upwards of an 80% reduction in plutonium. For example, “a thorium-fueled reactor …would produce a total of 92 kilograms of plutonium per gigawatt-year of electricity generated, whereas a conventional water-cooled reactor would result in 232 kilograms.” In addition to a lower percentage of plutonium in the spent fuel, the composition of the plutonium produced is different as well, featuring a higher content of the plutonium isotopes Pu-238, Pu-240, and Pu-242. Weapons-grade plutonium requires roughly 90% plutonium in the form of Pu-239. Plutonium with higher contents of Pu-238 and Pu-240 is inherently unpredictable, and can spontaneously fission, making it “difficult or impossible to compress a bomb core containing several kilograms of plutonium to supercriticality before the bomb [disassembles] with a greatly reduced yield.” This reduces the reliability of a given nuclear weapon, thus making the thorium process less suitable for the development of plutonium for a nuclear weapon. The International Atomic Energy Agency considers plutonium containing more than 81% Pu-238 “not weapons-usable.” Although thorium offers the ability to reduce the plutonium risk inherent in spent fuel, it does not eliminate the need for enriched uranium. Specifically, Lightbridge’s seed and blanket fuel technology would require uranium enriched to less than 20 % in both the seed and blanket fuel rods. Equally significant, the U-233 that is produced in the seed and blanket design poses its own proliferation concern. A nuclear weapon can be constructed with a significant quantity of U-233, which the IAEA defines as 8 kg of U-233, and both the U.S. and India have detonated nuclear devices which utilized U-233. At the same time though, U-233 produced through this design also contains a small amount of the uranium isotope U-232, which emits a powerful, highly penetrating gamma ray. As noted by Ray Sollychin, the Executive Director of the Neopanora Institute-Network of Energy Technologies, this reportedly makes “U233 weapons significantly more difficult to conceal and much more dangerous to handle.” In addition, reactors which use a thorium based seed and blanket design are engineered so that the U-233 which is produced is simultaneously denatured or blended with U-238, further reducing its suitability for a nuclear weapon. Moreover, the blanket is designed to remain within the reactor for upwards of nine to twelve years. This allows for the U-233 that is produced within the blanket to burn “in situ.” Lastly, any attempt to prematurely remove the blanket and separate the U-233 from the U-238, U-234 and U-236 isotopes will also “remove the fissile U-235 from the resulting enriched steam,” once again making it unsuitable for a nuclear weapon. From this brief review of thorium and its properties, it appears clear that from a proliferation standpoint, that thorium fueled reactors provide for a safer nuclear power production process. In fact, it begs the question why thorium was overlooked in the first place. The simple answer is that the U.S. nuclear infrastructure was originally designed to facilitate mass quantities of plutonium for the production of a nuclear weapons arsenal. According to an article by Richard Martin in Wired magazine, “Locked in a struggle with a nuclear- armed Soviet Union, the U.S. government in the 60’s chose to build uranium-fueled reactors — in part because they produce plutonium that can be refined into weapons-grade material.” During the Cold War, maintaining nuclear parity with the Soviets was an overarching goal. Yet, with the end of the Cold War, the focus has shifted from acquiring nuclear weapons to stymying their development by both state and non-state actors. Therefore, the plutonium byproduct of the global nuclear power infrastructure has now become a liability and a proliferation risk. As the IAEA has noted, “for nuclear power to be accepted as a significant contributor of primary energy in the next century, it should be based on a fuel cycle, which is highly proliferation-resistant.” For this reason, further research and development of thorium needs to be explored, not only in terms of seed and blanket technology but other thorium based designs as well, including thorium-based Pebble Bed Reactor, fast reactors (liquid metal cooled and gas cooled); and advanced designs such as Molten Salt Reactor and Accelerator Driven System.

#### LFTRs provide safe and effective reprocessing without risk of prolif

Hall 10 (Vincent, M.S. Chemical Engineering at University of Tennessee-Knoxville, Process Engineer at Burns & McDonnell, "A REVIEW OF THE BENEFITS AND APPLICATIONS OF THE THORIUM FUEL CYCLE," Sep 21, jam)

What appears to be the most promising reactor design for the thorium fuel cycle is the one for which it originally was intended, that is the Molten Salt Reactor (MSR) or Liquid Fluoride Thermal Reactor (LFTR). Current reactor designs, typified by solid fuel elements, necessitate that the power plant be modeled as a mechanical operation, the primary objective being the simplification of heat transfer equipment. However this is paid for by complicated fuel reprocessing. Solid fuel elements remain in the same position during their service time, accumulating fission and activation products until the fuel is so heavily poisoned that the nuclear reaction can no longer take place. The accumulation of poisons such as xenon requires the presence of more fuel than otherwise necessary, resulting in additional generation of waste. Eventually, the operation must be shutdown so that the fuel can undergo maintenance or replacement (Hron 222-223). At the least, the fuel bundles must be routinely shuffled in the core to avoid build up of neutron poisons, but this still requires downtime. Also, reprocessing is generally not economical as the solid fuel must be first converted to a liquid/gas for separations and then back to solid form for geological disposal. One alternative to this approach is a reactor with the fuel dissolved in a liquid core, modeling the facility morel like a chemical plant. Such a design seeks to maximize the ease of reprocessing and recovery (Briant and Weinberg 797). The Molten Salt Reactor Experiment (MSRE) performed at Oak Ridge National Laboratory (ORNL) from the 1950’s to 1970’s was extremely successful and demonstrated the feasibility of the technology. The continuous and flowing nature of the process provided simple fission product removal and reprocessing. Inherent safety and proliferation resistance features were also key elements of the design. A drawback to reprocessing with a MSR is that a reprocessing plant must be collocated with each plant site, which is an added cost. However, on site reprocessing reduces proliferation threats as it decreases the need for transportation. The MSRE was based upon the idea of dissolving the fertile and fissile materials as fluorides in a molten carrier salt, typically LiF and BeF2. It was designed as a seed- and blanket type reactor and was able to operate 233 U, 235 U, and 239 Pu as fissile fuels. The 232 Th233 U cycle is most applicable to a MSR, as it allows for much higher conversion in the thermal neutron spectrum, which is where the reactor operates, while the 238 U239 Pu cycle needs to take place in the fast spectrum to obtain complete conversion. In the original design of the MSRE, an inner spherical core contains the dissolved 233 UF4 in the fuel salt, where the nuclear reaction takes place. This is surrounded by a second vessel containing 232 ThF4 dissolved in a blanket salt. Neutron flux from the inner core passes into the blanket salt to transmute the thorium to fissile uranium. The blanket salt is continuously sent to a chemical processing plant where the thorium is returned to the blanket while the uranium is sent to the inner core fuel salt. Similarly, the fuel salt is also sent through a chemical separations procedure to remove fission products from the fuel. The rationale behind this design is due to the fact that thorium and the formed fission products are chemically similar, thus isolating the two species greatly simplifies the reprocessing procedure. The problem with this design was that the allowable critical diameter of the inner core was only 1 meter, too small to obtain sufficient power output on an industrial scale. The design was then altered so that the fluids were interlaced by an integrated plumbing scheme to provide sufficient neutron flux between the salts, while still keeping thorium separated from the fission products. However, the graphite present in the core would shrink and swell under the presence of the high irradiation, yielding a complicated and sensitive “plumbing problem”. A subsequent design was adopted that contained all the dissolved species in a single salt mixture. This design was eventually constructed and ran successfully for five years. The simplification of the reactor though, was compensated for by the difficulty in reprocessing the waste. ORNL used a Liquid Bismuth Reductive Extraction (LBRE) process to separate the fission products from thorium, but it was a very costly, complex, and delicate process (LeBlanc “Liquid Fluoride Reactors”). Now, with the current revival of interest in nuclear power, reinvestigations of ORNL’s “plumbing problem” in the two fluid design or optimization of the difficult LBRE process with current pyrochemical methods may provide an effective and economical way of closing the nuclear fuel cycle. Construction of a two fluid MSR capable of handling the flexing problem associated with the plumbing will greatly reduce the challenge of reprocessing. For the blanket salt, bubbling F2 gas through causes dissolved 233 UF4 to form gaseous 233 UF6, which can be easily removed, converted back to 233 UF4 by reacting with H2 and sent to the fuel salt. Likewise, for the removal of fission products from the inner core, uranium and gaseous fission products are first removed separately from the fuel salt based upon fluoride volatility. The salt is then placed in a still to undergo vacuum distillation. The decay heat of the fission products facilitates the evaporation of the salt which is recombined with the uranium, while leaving solid fission products behind for disposal. In addition, the two-fluid design solves the thorium fuel cycle’s protactinium problem. The risk of 233 Pa absorbing neutrons to form transuranic wastes is lessened because the neutron flux in the blanket salt where the protactinium is formed is much lower. Thus, 233 Pa can be allowed to simply remain in the salt and decay to 233 U (LeBlanc “Liquid Fluoride Reactors”). Efficiency, safety, and proliferation resistance features make the MSR a viable technology. The chemical and physical stability of the salt allow the reactor to reach much higher temperatures than traditional solid fuel reactors. The MSRE, a 1000 MWe design, demonstrated an operating temperature of 700°C, significantly higher than that of a typical LWR (~315°C). For any power cycle, higher temperatures result in higher efficiencies. A MSR could potentially allow power plants to replace steam driven turbines with the more efficient gas driven turbines (LeBlanc “Liquid Fluoride Reactors”). Today, a current 1 GW capacity nuclear plant requires up to 800,000 tons mined uranium ore to undergo milling and fuel fabrication, of which results to roughly 35-40 tons of spent fuel per year. A 1GWyr MSR however, only requires around 200 tons of thorium ore and results in about 1 ton of fission products and little to no transuranic waste due to the use of thorium as fuel. The absence of transuranics means that only 300-500 years is needed for the entirety of the fission product waste to decay to a stable and safe state. In addition, in the thermal spectrum, the best way demonstrated of obtaining complete fuel consumption is by use of a MSR run on the thorium fuel cycle. If all of the fuel from the uranium cycle is desired to be burned, the neutronic speeds must be switched to the fast, and arguably less safe, spectrum. With such efficiencies, it is possible that a thorium fueled MSR is capable of producing enough energy so that only 100 grams of pure thorium would represent the average U.S citizen’s lifetime energy consumption. In comparison 3.5kg of Lightly Enriched Uranium (LEU) would represent the same amount of energy (Sorensen “Energy from Thorium) as would 54 tons of coal (ENS “Fuel Comparison”). The design of a MSR is also inherently safe. As the fuel salt heats up inside the core, it expands and flows out of the high neutron flux zone. This loss of fissile material in the core limits the extent of reaction and cools down the system. The process works in reverse as well when the reactor is performing below the desired output temperature, the more dense salt allows more fissile material to flow in and increase the neutron economy. Unlike traditional pressurized water cooled designs, the liquid salt in the MSR serves as its own coolant and its high boiling point allows it to operate at low pressure. This eliminates the risk of a high pressure rupture in the system, so that no expensive containment vessels or piping and equipment designed for high pressure applications are needed. If there were however, a breach in the system, the high melting point of the salt would simply cause it to solidify upon contact with the air and possibly even seal the break. In the event of a loss of power to the system, ORNL developed a simple and effective method for cooling the reactor. Under normal operation, a fan system was used to cool and solidify a section of piping containing the salt, known as the “freeze plug”. If was power was lost, the freeze plug would simply melt and the molten salt would then flow to a passively cooled containment vessel. This is much simpler than current reactor designs were emergency coolant has to be brought to the reactor and override normal operation procedures (Sorensen “Energy from Thorium”). As a guard against weapons proliferation, the simple fact that the fuel exists as a molten liquid form with a temperature of at least 500°C makes it a difficult material to misappropriate. In addition, the use thorium fuel cycle yields 232 U as a side product of the burn-up chain, regardless of the reactor design, which also enhances proliferation resistance as its daughter products are strong gamma emitters that make direct handling and weapons usage difficult (IAEA 66). Furthermore, in the event of the security of the facility being compromised, 238 UF4 can be quickly dumped into the reactor, denaturing it to a form unsuitable for proliferation (LeBlanc “Liquid Fluoride Reactors”). The THOREX process is the most developed method for reprocessing. However, this process which utilizes a liquid-liquid extraction technique for the removal of uranium, thorium, and/or plutonium from the fission products has yet to reach the efficiency and practicality of its equivalent PUREX process (IAEA 65). The first step of reprocessing solid fuel elements from a LWR is the removal of its protective cladding, commonly referred to as the head-end process. This consists of either a series of mechanical de-cladding operations or a chemical de-cladding procedure. For most Zircaloy or stainless steel clad fuel elements the mechanical option is usually implemented, and consists of cutting, grinding, shearing, and crushing away the casing. The chemical option consists of either a dry-fluorination procedure, a SULFEX solution (5 M HNO3 + 2 M HCl and 5 M H2SO4) for SS removal or a ZIRFLEX solution (6 M NH4F + 0.5 M NH4NO3) for Zircaloy removal (IAEA 71). After the head-end process, the fuel is dissolved in the nitric acid based THOREX solution. This solution undergoes a varying degree of feed preparation, extraction, partitioning, and stripping stages depending on whether uranium, uranium and thorium, or uranium, thorium, and if present plutonium are desired to be recovered. Tributyl phosphate (TBP) dissolved in dodecane is generally used as the extractant. Control of the concentration of TBP and acidity of the scrubbing and stripping solutions permits selectivity of what actinides will be recovered (IAEA 72). In the 1980’s, Zimmer and Merz performed much work fine tuning the THOREX process developed by ORNL in the 1950’s by adjusting and optimizing acid and TBP concentrations throughout the extraction process in order to maximize decontamination factors and minimize precipitant crud formation. They also proposed the use of pulse columns for reprocessing thorium fuel. Compared to mixer-settlers, pulse columns provide less contact time between fission products and the organic phase, which leads to less decomposition of TBP into unwanted DBP. Also, any crud precipitation formed in the process is less likely to cause clogging than in mixer-settlers due to the increased flow velocity as well as a decrease in the occurrence of any unwanted third phase complexes associated with thorium and TBP. However, the issue of criticality should be acknowledged with pulse columns, as it was observed that the concentration of uranium in the upper part of the column in the partitioning stage is one order of magnitude higher than in the feed solution (Merz and Zimmer 338-339). The most common method of THOREX reprocessing is the sole retrieval of uranium leaving thorium discarded in the raffinate, known as the INTERIM 23 process. 1.5% to 5% TBP is used in the extraction stage, followed by a series of scrubbing stages with 1-2 M HNO3, and ending with a dilute nitric acid stripping stage to remove the 233 U from the organic solvent. If further purity is desired, an anionic exchange method in HCl solution may be used. This however, presents problems as corrosion control is arduous to maintain and the resulting corrosion products lead to poor decontamination factors (IAEA 72). When the retrieval of both uranium and thorium is desired a 30% to 43% TBP solution is capable of extracting both actinides. An acid strip greater than 0.3M HNO3 used in the partitioning stage removes the majority of the thorium, while a very dilute acid strip removes the uranium from the organic. A problem associated with this procedure is the aforementioned formation of a third phase due to poor solubility of the complexes formed by thorium and TBP in the dodecane diluent. Replacements for dodecane capable of sufficient loading without formation of a third phase are currently being considered such as amides and aromatic diluents (IAEA 73). Little investigation has been undertaken in the development of a three stream process for recovering plutonium if Th-Pu MOX fuel is used. This process would theoretically combine aspects of the PUREX and THOREX processes. A 5% TBP extraction / scrubbing / stripping process will yield a U-Pu nitrate solution that can then undergo traditional PUREX processing for eventual formation of separate oxide powders. The leftover thorium contained in the raffinate will then be removed from the fission products with at 30% TBP extraction / scrubbing / stripping process followed by precipitation and calcination to form an oxide powder. A problem presented in this scheme is the formation of nitrous gases that stabilize plutonium ions, limiting their solubility in the initial 5% TBP extractant. Considerable research is needed concerning the process chemistry of this scheme before its application can be realized (IAEA 74). If the intermediate 233 Pa, in the transmutation of 232 Th to 233 U, is desired for recovery and eventual conversion to 233 U, then considerable technological development must be undertaken. In the current THOREX process, protactinium passes through with the fission products in the raffinate waste. Not only is this a loss of the potentially re-usable 233 Pa as a transitional to 233 U, but it also means that any 231 Pa formed in the burn-up chain of 232 U will be carried with the remaining waste for permanent disposal. 231 Pa is an alpha emitting isotope with a long term radiological impact constituting a half-life of 3 x 10 4 years that is a concern regarding geological disposal. The recovery of both of these isotopes of protactinium would limit the amount and severity of the waste product and reduce fuel consumption as both can be converted to 233 U in the reactor (IAEA 65-66). An alternative to recovering 233 Pa from the spent fuel is to simply allow it to decay to 233 U before reprocessing. However, as stated early, this requires storage time of one year that can be expensive. Oddly enough, it appears that the most viable solution to solving the protactinium problem may have been already solved by ORNL in the 1960s. They were able to successfully absorb 98% of the protactinium dissolved in THOREX solution on pulverized unfired Vycor glass. This was done by introducing agitated contact between the protactinium containing solution and the Vycor glass for 24 hours. The difference in the gross gamma count of the glass and aqueous raffinate was then used to measure the amount of adsorbed protactinium. In order to determine if this technique is transferable to an industrial process, ORNL suggested that a hot-cell experiment involving THOREX solution from spent fuel pins be performed to determine the effects of fission product concentrations on the adsorption of protactinium under normal process conditions (Moore 1-2). It should be noted however, that the attainment of 233 U from 233 Pa from reprocessing poses a significant weapons proliferation problem. Any 233 U obtained from 233 Pa, will be considered Highly Enriched Uranium. This 233 U will have little of the proliferation limiting 232 U that it is normally associated with in the thorium burn-up chain. Thus, the Vycor adsorption process would limit the protactinium problem, so long as the protactinium recovered was sent back to the service end of the fuel cycle before conversion to 233 U. In addition, the THOREX process faces another challenge concerning the role of 232 U. On the one hand, the 232 U formed by (n, 2n) reactions of 232 Th, 233 Pa, and 233 U in the thorium decay chain provides a natural proliferation barrier as its decay products, such as 212 Bi and 208 Tl, yield strong gamma emissions of 0.78MeV and 2.6MeV, respectively. These emissions are capable of compromising the electronic triggering components of a military weapon attempting to utilize reprocessed 233 U, potentially rendering such a bomb unstable or useless. The presence of such radiation will also greatly aid in the exposure of concealed nuclear weaponry due to the growing science and technology of nuclear detection systems (IAEA 9). On the other hand, the presence of 232 U complicates spent fuel reprocessing. It has a half-life of roughly 72 years and the radioactivity of its daughter products necessitates remote, shielded, and preferably automated reprocessing. While this may be beneficial in deterring the proliferation of the spent fuel, it is costly and complicated. This is due to the fact that both 232 U and its alpha decay product 228 Th are chemically inseparable from their respective isotopes of 233 U and 232 Th (IAEA 66). Isotopic separation of the thorium should be easily achievable with current centrifugal effect technology due to the relatively large difference in atomic mass between the isotopes. However, the very slight mass difference between the uranium isotopes may prove to be a challenge. Emerging separation technologies involving mass spectrometry or atomic laser vapor isotope separation (AVLIS) may prove applicable to this process once further developed. If desired, the amount of 232 U can be minimized by controlling the neutron flux spectrum of the reactor. Higher 232 U concentrations are associated with fast neutron spectrums than with thermal. For a fast LWR, for example, the 232 U present is roughly on the order of 2000-3000 ppm. In a thermalized PHWR, 232 U concentration is expected at 500-1000 ppm. However, it has been demonstrated by the BN-350 sodium cooled fast reactor in Kazakhstan, that by introducing a 15-20 cm spacing between the thorium blanket and central core, 232 U can be all but eliminated. The 232 U obtained from this design was only 2-11 ppm, proving that minimization of 232 U can be achieved, but this returns us to the proliferation problem of reprocessing pure 233 U (IAEA 66). Unlike UO2 and PuO2, ThO2 exists in only one oxidation state, making it more stable under most storage and process conditions. While UO2 is easily dissolved in nitric acid, mixed fuels containing over 80% ThO2 cannot be dissolved in pure HNO3. A small amount of HF is needed to aid in the dissolution. The addition of HF, however, introduces a corrosion problem for stainless steel piping and equipment. These effects can be mitigated with the addition of aluminum nitrate, which complexes with excess free fluoride ions that would otherwise instigate corrosion. In the 1950’s ORNL developed a process using the following dissolved acid: 13M HNO3+0.05 M HF+0.1M Al (NO3)3 which is now the accepted THOREX solution formula and has served as the best medium for dissolving ThO2 to date. ThO2 is dissolved in THOREX solution at ~120°C and ambient pressure, while coupled with agitation. Increasing the temperature and pressure to ~200°C and 9 atm greatly increases the dissolution rate, but of course increases safety risk as well. It has been also demonstrated that irradiated fuel dissolves more readily in solution than fresh fuel. This is most likely attributed to disturbances formed in the crystal structure of the spent fuel during the service period. Recent experiments performed with un-irradiated fuel have also shown that the addition of roughly 1.5% MgO during the pellet fabrication stage and replacement of HF with NaF in the THOREX solution lead to increased dissolution rates (IAEA 66). Disposal The direct disposal of spent thorium fuels would be anticipated to be very similar to that of uranium. Currently, different countries have adopted different methodologies for disposing of nuclear waste. In the U.S, civilian waste remains on-site in large cooling ponds. These large concrete structures serve to provide radiation protection and remove heat generated from radioactive decay. It is intended that after sufficient cooling time, the waste from these pools will be encapsulated and transported to a permanent geological repository such as Yucca Mountain in Nevada or the Waste Isolation Pilot Plant in New Mexico (WNA “Waste Management”). In Canada, long term waste management plans involve placement of the waste in corrosion resistant containers enclosed by a clay-based buffer barrier. These containers are then set into a deeply excavated granite vault for permanent disposal (IAEA 76). In Europe, much of the spent fuel is actually reprocessed in either the UK or France. The recovered fuel is returned to the plants, while the waste is vitrified, sealed in stainless containers, and either stored at the reprocessing facility or returned as well. Eventually, the waste will also be sent to permanent geological disposal (WNA “Nuclear Waste Management”). Thus, regardless of when and how the waste gets there, a geological repository is the final step in waste management for all countries. It is here were thorium based fuels hold the advantage over traditional uranium fuels. The high chemical stability of ThO2 and its very low solubility in groundwater aids in its retention of harmful fission products, making it suitable for direct geological disposal. Also, it has bee shown that fission gas release. from defected thorium fuel elements is 1 to 2 orders of magnitude lower than that of uranium and that release of Br, Cs, and Rb from the fuel matrix is much slower as well (IAEA 78). In the event of a rupture of the casing material during permanent disposal, a gas leak containing radioactive material would pose safety and logistics issues, which a thorium fuel cycle would moderate. A dramatic renovation in the operation and protocol of the nuclear power industry must be undertaken in order for the thorium fuel cycle to be utilized. This will be an extremely difficult task, as a whole new nuclear infrastructure will have to be installed and will be in direct competition with very strong and influential enterprises that already have a reliable and profitable system established. Thus, the only way for thorium power to be economically accessible, is for an increased public awareness of the benefits it can provide, so as to feed demand. Thorium is capable of fixing the negative stigma associated with nuclear energy by providing a sustainable, safe, and weapons resistant form of power. When coupled with MSR technology, the thorium fuel cycle will be capable of producing little to no long lived transuranic waste, will have a natural negative void coefficient during service end operation, and will deter weapons proliferation with the presence of 232 U and ease of denaturing. The more minds that are aware of and insist upon the use of thorium power, the sooner it will be economically realizable and available to the public as a very clean form of energy.

#### Plan makes the U.S. a leader in thorium tech – formal mechanisms buoy international adoption

Johnson 6 (Brian, BS Nuclear Engineering from Oregon State U, later received a Ph.D. in Nuclear Science and Engineering from M.I.T., "Thorium for Use in Plutonium Disposition,Proliferation-Resistant Fuels for DevelopingCountries, and Future Reactor Designs," [www.wise-intern.org/journal/2006/Johnson-ANS.pdf], jam)

As it stands, the joint plutonium disposition plans of the United State and Russia have stalled. This is because MOX, the technology chosen to undertake disposition, has taken more time and money than expected. In addition to this, Russia refuses to bear any of the cost of plutonium disposition through the use of MOX. This has opened the door to other options including thorium based fuels. A program in Russia examining thorium-based fuels has made a lot of progress and promises to be an excellent way to dispose of plutonium. The United States cannot directly benefit from this research and should start a program equal in size to the Russian program so that if thorium-based fuels turn out to be a better option for disposition there will be less delay in implementation. The United States outlines a desire in the Global Nuclear Energy Partnership (GNEP) to establish reactors in developing nations to provide potable water, heat for industrial processes, and electricity to growing populations. There are currently no designs that have all of the characteristics desired for reactors to be deployed in developing countries. Thorium-based, proliferation-resistant fuels can provide an evolutionary step until better technologies are developed. The design of this fuel shares a lot of the same technology as thorium-based fuel for plutonium disposition. Because of this, the same program could cover both research objectives with marginal added cost. Molten salt reactors meet all of the goals of next generation fuel cycles. However, the United States is not currently funding research into the technology. Recent research done in France has shown that some of the issues that prohibited development can be resolved. The United States is the only country with operating experience with molten salt reactors. Considering these facts, it makes sense for the United States to fund some research into this promising technology. Thorium could be used to reach several goals in the United States. The technology is not ready for implementation. The United States should fund research into thorium to reach these goals. In doing so, the United States could become a leader in thorium-based technology.

#### Domestic development prompts global exports

Rosner & Goldberg 11 (Robert, William E. Wrather Distinguished Service Professor, Departments of Astronomy and Astrophysics, and Physics, and the College at the U of Chicago, and Stephen, Energy Policy Institute at Chicago, The Harris School of Public Policy Studies, "Small Modular Reactors - Key to Future Nuclear Power Generation in the U.S.," November 2011, [https://epic.sites.uchicago.edu/sites/epic.uchicago.edu/files/uploads/EPICSMRWhitePaperFinalcopy.pdf], jam)

Previous studies have documented the potential for a significant export market for U.S. SMRs, mainly in lesser developed countries that do not have the demand or infrastructure to accommodate GW-scale LWRs. Clearly, the economics of SMR deployment depends not only on the cost of SMR modules, but also on the substantial upgrades in all facets of infrastructure requirements, particularly in the safety and security areas, that would have to be made, and as exemplified by the ongoing efforts in this direction by the United Arab Emirates (and, in particular, by Abu Dhabi). This is a substantial undertaking for these less developed countries. Thus, such applications may be an attractive market opportunity for FOAK SMR plants, even if the cost of such plants may not have yet achieved all of the learning benefits. The Department of Commerce has launched the Civil Nuclear Trade Initiative, which seeks to identify the key trade policy challenges and the most significant commercial opportunities. The Initiative encompasses all aspects of the U.S. nuclear industry, and, as part of this effort, the Department identified 27 countries as “markets of interest” for new nuclear expansion. A recent Commerce Department report identified that “SMRs can be a solution for certain markets that have smaller and less robust electricity grids and limited investment capacity.” Studies performed by Argonne National Laboratory suggest that SMRs would appear to be a feasible power option for countries that have grid capacity of 2,000-3,000 MW. Exports of SMR technology also could play an important role in furthering non-proliferation policy objectives. The design of SMR nuclear fuel management systems, such as encapsulation of the fuel, may have non-proliferation benefits that merit further assessment. Also, the development of an SMR export industry would be step toward a U.S.-centric, bundled reliable fuel services. Exports of FOAK plants help achieve learning without the need for a full array of production incentives required for domestic FOAK deployments. Projected, unsubsidized, electricity market prices will likely be higher in selected foreign markets, particularly when the electricity pricing is based on liquefied natural gas import prices. 49 This situation would enable SMRs to be in a more favorable competitive position. SMR exports would qualify, if needed, for export credit assistance under current U.S. government programs, but this assistance would not require the need for new federal funding.

#### Scenario 2 is Iran

#### Thorium solves Iran prolif and Middle East war

Harrington 12 (Anthony, award-winning business and energy journalist, writing regularly for the Scotsman newspaper, the Glasgow Herald newspaper, Financial Director magazine, Pensions Insight magazine, CA Magazine, and a number of other publications, "Thorium reactors could hold the key to safer cheaper nuclear power," Aug 30, [www.qfinance.com/blogs/anthony-harrington/2012/08/30/thorium-reactors-could-hold-the-key-to-safer-cheaper-nuclear-power], jam)

It goes without saying that business needs energy to run. The wheels of industry have to turn and the power that drives them has to be generated. Moreover, business needs energy to be affordable and safe and by safe we mean both safe from a Fukushima type incident, and safe from a Chernobyl type incident. So business has a vested interest in energy generation and particularly in new types of energy generation that hold out the prospect of plentiful cheap energy. In an earlier blog, I looked at the ITER molten plasma fusion reactor which uses deuterium and tritium as fuel. The first real, near commercial scale fusion reactor is currently being built by a consortium of nations in the south of France. Of course, offshore wind or massive desert based solar power plants are the option of choice as far as renewable energy sources are concerned. But while alternative renewable energy sources are clean, they are certainly not cheap. In fact they would be a non starter without subsidies. The subsidies can be justified relatively easily by setting their cost against the likely costs of runaway global warming, or against the potential for a rise in catastrophic weather events like hurricanes and typhoons. However, offsetting, or rather, justifying, costs in this manner is not the same thing as finding a new source of plentiful, relatively cheap energy. Somewhat surprisingly, while not new, an alternative, and much less dangerous, approach to generating nuclear energy has been around since the 1950s. Thorium, a naturally occurring radioactive chemical element, is around four times more abundant than uranium in the earth's crust and has the inestimable advantage over uranium of not being suitable for the production of weapons grade material for nuclear bombs. Moreover the use of thorium in what is called a "molten salts reactor" (MSR) poses absolutely no risk of a "melt down" of the core, such as we saw at Fukushima and Chernobyl. MSR research was championed by Alvin Weinberg, the director of the main US nuclear research laboratory at Oak Ridge Tennessee in the 1950s. The project, by all accounts, was successful and the MSR reactor ran for thousands of hours before Richard Nixon cut off funding and shut the project down in the 1960s in order to redirect research into reactors that were capable of breeding plutonium for nuclear bombs. Great thinking from Tricky Dickie, which basically set the world back 50 years as far as thorium reactors are concerned. Nixon also brilliantly fired Weinberg and installed his own man who had no interest in MSR, as director of Oak Ridge. (It's true - the idiocy of a US president really can have a profound long term impact on the world business operates in.) Why does this matter? One simple example. If we had an established base of operating MSR reactors based on thorium, there would be a very viable alternative nuclear road for Iran to go down, and one that would not have Israel threatening to start a major war in the Middle East in order to prevent Iran from acquiring nuclear weapons. Thorium reactors are extremely bad at breeding weapons grade uranium. Even now the US could offer to swap out Iran's current nuclear programme for one based on thorium MSR reactor technology, thus defusing the situation should Iran accept, but unfortunately, no one has thought of this - yet... There are plenty of signs that after being sidelined for half a century, interest in thorium reactors is now on the increase. In the UK the Weinberg Foundation, which has the Labour life peer Baroness Worthington as its patron, was founded in September 2001. India has a major thorium research programme in hand and other nations too, including Japan post Fukushima are investigating thorium MSR reactors. What do they offer? Again, there is a web site dedicated to thorium reactors which interested readers may want to browse. The positives include: no greenhouse gas emissions, a fantastically high fuel to energy conversion (only some 2% of the fuel remains as waste, as against 95% from current reactors); a much shorter half life (a few hundred years versus a few thousand years); no production of plutonium; runs at atmospheric pressure; and they are cheaper to build than coal fired power stations. Sounds good? It is good, and anti nuclear campaigners need to go back to school on this one, since the usual knee jerk reactions against nuclear power are not particularly relevant to thorium MSR reactors. Unfortunately, despite the labours (no pun intended) of the good baroness, the Coalition government in the UK appears to be deeply asleep as far as thorium is concerned. The UK's future nuclear programme continues to be 100% uranium based. Whether that will change as other countries bring forward their thorium reactor research remains to be seen.

#### Testing Iran is key – negotiations prove

Haas 10/17 - President of the Council on Foreign Relations since 2003, previously served as Director of Policy Planning for the US State Department, http://www.project-syndicate.org/commentary/can-iran-compromise-on-its-nuclear-program-by-richard-n--haass

NEW YORK – Most of the debate about how to address Iran’s efforts to develop nuclear-weapons capacity focuses on two options. The first is to rely on deterrence and live with an Iran that has a small nuclear arsenal or the ability to assemble one with little advance notice. The second is to launch a preventive military strike aimed at destroying critical parts of the Iranian program and setting back its progress by an estimated two or more years. But now a third option has emerged: negotiating a ceiling on the nuclear program that would not be too low for Iran’s government and not too high for the United States, Israel, and the rest of the world. In fact, such an option has been around for years – and in several rounds of negotiations. What has changed, however, is the context. And changes in context can be critical; indeed, what happens away from the negotiating table almost always determines the outcome of face-to-face talks. The single most important change in context is the rapidly deteriorating state of Iran’s economy. The many financial and oil-related sanctions that have been implemented in recent months and years are starting to bite. They were designed not to impede Iran’s nuclear program directly, but rather to increase the price that Iran’s leaders must pay for pursuing their nuclear ambitions. The thinking (or, more accurately, the hope) was that Iran’s leadership, if forced to choose between regime survival and nuclear weapons, would choose the former. This hypothesis may soon get a real-world test. Iran’s currency, the rial, has fallen roughly 40% in recent weeks, sharply increasing Iran’s inflation rate and what Iranians must pay for imports and many staples. The result is the first signs of serious public discontent with the regime since the violent repression of the Green Movement in 2009. Iran’s merchant class, one of the pillars of the clerical establishment that has ruled the country since the 1979 revolution, is grumbling as well. Other factors also could give negotiations a real chance. Upheavals in the Arab world suggest that no regime in the Middle East is entrenched; Iran’s leaders would have to be blind not to have taken note. In his speech at the United Nations in late September, Israeli Prime Minister Binyamin Netanyahu signaled a willingness to give sanctions more time, until at least the summer of 2013. And there are signs that, regardless of who wins November’s presidential election, the US might well undertake an armed strike, with potential destruction much greater than if Israel were to act alone. Again, the Iranians might see compromise as the lesser of the threats that it faces. Until now, negotiations have been desultory at best. The compromise that Iranian officials are suggesting is nowhere near what they would have to accept to avert military action and gain an easing of sanctions. But now is the time to present to Iran a comprehensive package – what it must do and what the reward would be if it agreed. It would also be essential to set a deadline for Iran to accept such an accord, lest it use further negotiations to buy time to improve its nuclear capabilities. The precise terms would have to be determined, but Iran would have to give up all of the uranium that it has enriched to 20% and stop enriching to that level. It would also have to accept a ceiling on how much uranium it could possess or enrich at lower levels. Limits on the number of centrifuges and where they could be housed might also be necessary. Inspections would need to be frequent and intrusive to reassure the outside world of what Iran is doing – or, perhaps more to the point, what it is not doing. In return, Iran would receive substantial relief from the removal of those sanctions imposed in response to its nuclear program. Moreover, the offer’s essential elements should be made public. That way, if the regime balked, it would have to explain to its own people why it was not prepared to abandon its nuclear-weapons program, despite a reasonable US proposal that was not designed to humiliate Iran, and that, if accepted, promised a major improvement in Iranian living standards. It is possible that the new economic and political context will lead Iran’s rulers to accept what they have rebuffed until now. If, on the other hand, the regime remains determined to pursue its nuclear goals, regardless of cost, then we will know that there is no alternative to the first two options: attacking Iranian facilities or living with a nuclear-armed Iran. Both outcomes are potentially risky and costly, but the US public, in particular, should be made aware that it was Iran that rejected a reasonable alternative to war before one began. And, if push came to shove, it would be good for other governments to know that the US and/or Israel decided to attack only after offering Iran a face-saving way out. That would make it less difficult to keep economic pressure on Iran in the aftermath of any strike. Going public makes sense for another reason: Iran’s people ought to know that any attack on the country was one that it had largely brought on itself. This realization might mute any “rally around the flag” reaction and thus not rule out regime change down the road. We tend to think of diplomacy as something carried out in secret; sometimes, however, it is better to hide in plain sight. This is such a moment. But time is of the essence; diplomacy needs to move faster if it is not to be overtaken by Iran’s march to a nuclear weapon – and, with it, the march to conflict.

#### SMRs are key to prolif-resistant cradle-to-grave nuclear tech adoption – solves Iran

Mandel 9 (Jenny, Scientific American, Environment and Energy Publishing, LLC, "Less Is More for Designers of "Right-Sized" Nuclear Reactors," Sep 9, [www.scientificamerican.com/article.cfm?id=small-nuclear-power-plant-station-mini-reactor], jam)

Tom Sanders, president of the American Nuclear Society and manager of Sandia National Laboratories' Global Nuclear Futures Initiative, has been stumping for small rectors for more than a decade. American-made small reactors, Sanders insists, can play a central role in global nonproliferation efforts. "Our role at Sandia is the national security-driven notion that it's in the interests of the U.S. to be one of the dominant nuclear suppliers," Sanders said. While U.S. companies have been exiting the industry over the past decades as government and popular support for new construction has waned, Sanders maintains that strong U.S. participation in the nuclear energy marketplace would give diplomats a new tool to use with would-be nuclear powers. "It's hard to tell Iran what to do if you don't have anything Iran wants," he explained. Sanders said mini-reactors are ideal to sell to developing countries that want to boost their manufacturing might and that would otherwise look to other countries for nuclear technologies. If the United States is not participating in that market, he said, it becomes hard to steer buyers away from technologies that pose greater proliferation risks. Sanders been promoting this view since the 1990s, he said, when he realized "we were no longer selling nuclear goods and services, so we could no longer write the rules." The domestic nuclear industry had basically shut down, with no new construction in decades and a flight of talent and ideas overseas. There is a silver lining in that brain drain, though, he believes, in that U.S. companies getting back into the game now are less tied to the traditional, giant plants and are freer to innovate. A feature that several of the new product designs share is that the power plants could be mass-produced in a factory to minimize cost, using robots to ensure consistency. Also, with less design work for each installation, the time to complete an order would be shortened and some of the capital and other costs associated with long lead times avoided, Sanders said. Another feature he favors is building the plants with a lifetime supply of fuel sealed inside. Shipped loaded with fuel, such reactors could power a small city for 20 years without the host country ever handling it. Once depleted, the entire plant would be packed back up and shipped back to the United States, he said, with the sensitive spent fuel still sealed away inside. Sanders is working on a reactor design hatched by the lab with an undisclosed private partner. He believes it is feasible to build a prototype modular reactor -- including demonstration factory components and a mockup of the reactor itself -- as early as 2014, for less than a billion dollars. A mini-reactor could ring up at less than $200 million, he said, or at $300 million to $400 million with 20 years of fuel. At $3,000 to $4,000 per kilowatt, he said, that would amount to significant savings over estimates of $4,000 to $6,000 per kilowatt for construction alone with traditional plant designs. To get a design ready to build, Sanders is urging a partnership between the government and the private sector. "If it's totally a government research program, labs can take 20 to 30 years" to finish such projects, he said. "If it becomes a research science project, it could go on forever." New approach, old debates So far, there is no sign that the government's nuclear gatekeeper, NRC, is wowed by the small-reactor designs. NRC's Office of New Reactors warned Babcock & Wilcox in June that the agency "will need to limit interactions with the designers of small power reactors to occasional meetings or other nonresource-intensive activities" over the next two years because of a crowded schedule of work on other proposals. Meanwhile, opponents of nuclear technologies are not convinced that small reactors are an improvement over traditional designs. Arjun Makhijani, who heads the Institute for Energy and Environmental Research, a think tank that advocates against nuclear power, sees disseminating the technology as incompatible with controlling it. "A lot of the proliferation issue is not linked to having or not having plutonium or highly enriched uranium, but who has the expertise to have or make bombs," Makhijani said. "In order to spread nuclear technologies, you have to have the people who have the expertise in nuclear engineering, who know about nuclear materials and chain reactions and things like that -- the same expertise for nuclear bombs. That doesn't suffice for you to make a bomb, but then if you clandestinely acquire the materials, then you can make a bomb." Peter Wilk, acting program director for safe energy with Physicians for Social Responsibility, an anti-nuclear group, argues that expanding nuclear power use runs counter to the goal of nonproliferation. "The whole proposition presupposes an ... international economy in which more and more fuel is produced and more and more waste must be dealt with, which only makes those problems that are still unsolved larger," he said. "It may or may not do a better job of preventing the host country from literally getting their hands on it, but it doesn't reduce the amount of fuel in the world or the amount of waste in the world," Wilk added. And then there is the issue of public opinion. "Imagine that Americans would agree to take the waste that is generated in other countries and deal with it here," Makhijani said. "At the present moment, it should be confined to the level of the fantastic, or even the surreal. If [the technology's backers] could come up with a plan for the waste, then we could talk about export." Makhijani pointed to a widely touted French process for recycling nuclear waste as a red herring (ClimateWire, May 18). "It's a mythology that it ameliorates the waste problem," he said. According to Makhijani's calculations, the French recycling process generates far more radioactive waste than it cleans up. One category of highly radioactive material, which ends up stored in glass "logs" for burial, is reduced, he said. But in processing the waste, about six times the original volume of waste is produced, he said. Much of that must be buried deep underground, and the discharge of contaminated wastewater used in recycling has angered neighboring countries, he said. Operational risk, of course, is another major concern. "One has reduced the amount of unnecessary risk," Wilke said, "but it's still unnecessary risk." He added, "I get the theory that smaller, newer, ought to be safer. The question is: Why pursue this when there are so many better alternatives?" To Sandia's Sanders, Wilke is asking the wrong question. With the governments of major economies like China, Russia and Japan putting support and cash into nuclear technologies, the power plants are here to stay, he believes. "There's going to be a thousand reactors built over the next 50 years," he said. "The question is: Are we building them, or are we just importing them?"

#### Testing Iran exposes intent which solves proliferation and Israeli strikes

Ross 12 (Ambassador Dennis, counselor at The Washington Institute, previously served as special assistant to President Obama and senior director for the central region at the National Security Council, "Calling Iran’s Bluff: It’s Time to Offer Tehran a Civilian Nuclear Program," Jun 15, [www.tnr.com/article/politics/104085/calling-iran’s-bluff-its-time-offer-iran-civilian-nuclear-program?page=0,1], jam)

Herein lies the trap for Washington in the current step-by-step approach. We have said we will not take part in a phony process and that each round of talks must achieve enough to justify another round. So if nothing emerges from Moscow, will we suspend the talks? Iran will be enriching; the clock toward the “zone of immunity” the Israelis fear keeps ticking. The Israeli justification for holding off on a military strike will weaken. True, we could argue that the sanctions need to be given more time to work and bring the Iranians around. But what is the end-point on that? And, unless we are prepared explicitly to tell the Israelis now that they need not strike because we will do so by a certain date, any argument in favor of allowing sanctions to take their course increasingly communicates that we are willing to settle for an outcome in which we contain, rather than prevent, an Iranian nuclear weapons capability. That, of course, is not President Obama’s position. He has stated clearly that our objective is prevention and not containment—and I have no doubt that he means it. Today, however, I don’t think the Iranians believe it. That is why our diplomacy needs to make that position more credible. The current step-by-step approach is not up to the task. It lends itself too much to a dilatory process that we cannot sustain. Worse, it denies us the ability to put a comprehensive proposal to the Iranians, one that permits us to directly address the core question of the negotiations: namely, whether Iran is prepared to accept not having a break-out capability to nuclear weapons. It's clear what the diplomacy around such a comprehensive proposal would entail: We would offer Iran a civil nuclear power capability—and if they reject the proposal, it would be presented to the public as a declaration that the Iranians want a nuclear weapons capability not civil nuclear power. Abandoning incremental step-by-step negotiations for a more direct end-state proposal of this sort offers obvious and not-so-obvious diplomatic advantages. First, the Israelis are much more likely to hold off if they know that this is the aim of the talks. Determining the end-state of Iran’s nuclear program matters much more to them than stopping the clock temporarily, particularly because they fear the price for producing the latter would be the easing of pressure on Iran. Second, and more importantly, we need a credible basis for using force if it comes to it. Context matters. It matters because the use of force is a means not an end. Iran has the know-how and the engineering capability to reconstitute its nuclear program, so it will be critical to maintain sanctions even after force has been used—and that requires that much of the international community accepts that the use of force was justified. If we or the Israelis use force, it is essential that we be seen as first having tried everything short of force and that the Iranians effectively brought this on themselves. The point is that we can only demonstrate that diplomacy was tried and failed—that we and/or the Israelis were left with no choice but to use force—if we first directly offer to Iran the possibility of a civilian nuclear program. The irony is that the best way to give diplomacy a chance to succeed is for the Iranians to know we are not afraid of diplomacy failing and we are prepared to use force if it does. Indeed, history shows that nothing concentrates the Iranian government's mind like the real prospect of force being used against it. When, in 2003, the Iranians thought they were next after the U.S. military defeated the Iraqi army in three weeks—an army the Iranians could not defeat in eight-and-a-half years—they altered their position and agreed to suspend uranium enrichment. Ultimately, Ali Khamenei’s most important objective is to die in office of natural causes. But the first step for the 5+1 will be to move away from the step-by-step approach and to begin focusing on outcomes rather than interim steps. The current incrementalism is a trap that could either force us to walk away from talks prematurely, or continue them in a way that will leave the Israelis believing the 5+1 is dragging out talks to pre-empt the Israeli use of force—a perception that will make it more likely Israel will feel compelled to act, not less. A process geared to clarifying whether a real deal is possible with Iran will require putting a credible proposal on the table. It may take some time to reach agreement with the other members of the 5+1, but once that's done, it will have the benefit of clarifying the actual state of our negotiations with Iran. Best of all, it will signal that we are ready for either outcome: a diplomatic deal, or a diplomatic failure—with all that implies about our readiness to use force.

#### Nuke war – miscalc and first use pressure

Robb et al 10/10 (“The Price of Inaction: An analysis of energy and economic effects of a Nuclear Iran” Bipartisan Policy Center. Task Force Co-Chairs: Charles Robb, former Governor and US Senator from Virgina and Charles Wald, Former Deputy Commander of US European Command. Task Force Members: Dr. Daniel Ahn Senior Economist and Head of Portfolio Strategy, CitiBank New York Christopher Carney Former U.S. Representative from Pennsylvania Ambassador Eric Edelman Former Under Secretary of Defense for Policy Secretary Dan Glickman Senior Fellow, Bipartisan Policy Center; Former Chairman, U.S. House Permanent Select Committee on Intelligence Larry Goldstein Founder of Energy Policy Research Foundation Inc. John Hannah Former Assistant for National Security Affairs to the Vice President Ed Husain Senior Fellow for Middle Eastern Studies, Council on Foreign Relations Reuben Jeffrey III Former United States Under Secretary of State for Economic, Business, and Agricultural Affairs Admiral (ret.) Gregory Johnson Former Commander of U.S. Naval Forces, Europe; Senior Adviser, Bipartisan Policy Center General (ret.) Ron Keys Former Commander, Air Combat Command Stephen Rademaker Former Assistant Secretary of State for Arms Control and Nonproliferation Ambassador Dennis Ross Counselor, The Washington Institute for Near East Policy; Former special assistant to President Obama and NSC Senior Director for the Central Region The Honorable John Tanner Former U.S. Representative from Tennessee Mortimer Zuckerman CEO and Chairman of the Board of Directors, Boston Properties, Inc.)

A nuclear Iran would immediately encounter another nuclear state—even if an undeclared one—in the region: Israel. Compared with the relative stability of the Cold War, an initial stalemate between Israel and Iran would be highly precarious at best and would also threaten the entirety of Gulf exports, although for a more limited duration. Were Iran to become nuclear, the frequency of crises and proxy conflicts between Iran and Israel would likely increase, as would the probability of such confrontations spiraling into a nuclear exchange, with horrendous humanitarian consequences. There could be an Israeli-Iranian nuclear exchange through miscalculation and/or miscommunication. There could also be a calculated nuclear exchange, as the Israeli and Iranian sides would each have incentives to strike the other first. Tehran would likely have the ability to produce only a small handful of weapons, whereas Israel is already estimated to possess more than 100 devices, including thermonuclear warheads far beyond the destructive power of any Iranian fission weapon. Under such circumstances, Iran’s vulnerability to a bolt-from-the-blue Israeli nuclear strike would actually increase its incentive to launch its own nuclear attack, lest its arsenal be obliterated. Israel’s small territorial size reduces the survivability of its second-strike capability and, more importantly, the survivability of the country itself, despite its vastly larger and more advanced arsenal. Thus, Israeli leaders might feel the need to act preventatively to eliminate the Iranian arsenal before it can be used against them, just as American military planners contemplated taking out the fledgling Soviet arsenal early in the Cold War, except that as a much smaller country Israel has far less room for maneuver. xxvi

### Solvency

#### Text: The Department of Defense should substantially increase market-fixed production cost incentives for electricity from Small Modular Liquid Fluoride Thorium Reactors for military facilities in the United States.

#### Thorium reactor tech exists—but no domestic development now

Evans-Pritchard ’10 Ambrose Evans-Pritchard, International Business Editor, “Obama could kill fossil fuels overnight with a nuclear dash for thorium,” The Telegraph (UK), 8/29/2010, http://www.telegraph.co.uk/finance/comment/7970619/Obama-could-kill-fossil-fuels-overnight-with-a-nuclear-dash-for-thorium.html

Muddling on with the status quo is not a grown-up policy. The International Energy Agency says the world must invest $26 trillion (£16.7 trillion) over the next 20 years to avert an energy shock. The scramble for scarce fuel is already leading to friction between China, India, and the West. There is no certain bet in nuclear physics but work by Nobel laureate Carlo Rubbia at CERN (European Organization for Nuclear Research) on the use of thorium as a cheap, clean and safe alternative to uranium in reactors may be the magic bullet we have all been hoping for, though we have barely begun to crack the potential of solar power. Dr Rubbia says a tonne of the silvery metal – named after the Norse god of thunder, who also gave us Thor’s day or Thursday - produces as much energy as 200 tonnes of uranium, or 3,500,000 tonnes of coal. A mere fistful would light London for a week. Thorium burns the plutonium residue left by uranium reactors, acting as an eco-cleaner. "It’s the Big One," said Kirk Sorensen, a former NASA rocket engineer and now chief nuclear technologist at Teledyne Brown Engineering. "Once you start looking more closely, it blows your mind away. You can run civilisation on thorium for hundreds of thousands of years, and it’s essentially free. You don’t have to deal with uranium cartels," he said. Thorium is so common that miners treat it as a nuisance, a radioactive by-product if they try to dig up rare earth metals. The US and Australia are full of the stuff. So are the granite rocks of Cornwall. You do not need much: all is potentially usable as fuel, compared to just 0.7pc for uranium. After the Manhattan Project, US physicists in the late 1940s were tempted by thorium for use in civil reactors. It has a higher neutron yield per neutron absorbed. It does not require isotope separation, a big cost saving. But by then America needed the plutonium residue from uranium to build bombs. "They were really going after the weapons," said Professor Egil Lillestol, a world authority on the thorium fuel-cycle at CERN. "It is almost impossible make nuclear weapons out of thorium because it is too difficult to handle. It wouldn’t be worth trying." It emits too many high gamma rays. You might have thought that thorium reactors were the answer to every dream but when CERN went to the European Commission for development funds in 1999-2000, they were rebuffed. Brussels turned to its technical experts, who happened to be French because the French dominate the EU’s nuclear industry. "They didn’t want competition because they had made a huge investment in the old technology," he said. Another decade was lost. It was a sad triumph of vested interests over scientific progress. "We have very little time to waste because the world is running out of fossil fuels. Renewables can’t replace them. Nuclear fusion is not going work for a century, if ever," he said. The Norwegian group Aker Solutions has bought Dr Rubbia’s patent for an accelerator-driven sub-critical reactor, and is working on his design for a thorium version at its UK operation. Victoria Ashley, the project manager, said it could lead to a network of pint-sized 600MW reactors that are lodged underground, can supply small grids, and do not require a safety citadel. It will take £2bn to build the first one, and Aker needs £100mn for the next test phase. The UK has shown little appetite for what it regards as a "huge paradigm shift to a new technology". Too much work and sunk cost has already gone into the next generation of reactors, which have another 60 years of life. So Aker is looking for tie-ups with countries such as the US, Russia, or China. The Indians have their own projects - none yet built - dating from days when they switched to thorium because their weapons programme prompted a uranium ban. America should have fewer inhibitions than Europe in creating a leapfrog technology. The US allowed its nuclear industry to stagnate after Three Mile Island in 1979. Anti-nuclear neorosis is at last ebbing. The White House has approved $8bn in loan guarantees for new reactors, yet America has been strangely passive. Where is the superb confidence that put a man on the moon? A few US pioneers are exploring a truly radical shift to a liquid fuel based on molten-fluoride salts, an idea once pursued by US physicist Alvin Weinberg at Oak Ridge National Lab in Tennessee in the 1960s. The original documents were retrieved by Mr Sorensen. Moving away from solid fuel may overcome some of thorium’s "idiosyncracies". "You have to use the right machine. You don’t use diesel in a petrol car: you build a diesel engine," said Mr Sorensen. Thorium-fluoride reactors can operate at atmospheric temperature. "The plants would be much smaller and less expensive. You wouldn’t need those huge containment domes because there’s no pressurized water in the reactor. It’s close-fitting," he said. Nuclear power could become routine and unthreatening. But first there is the barrier of establishment prejudice. When Hungarian scientists led by Leo Szilard tried to alert Washington in late 1939 that the Nazis were working on an atomic bomb, they were brushed off with disbelief. Albert Einstein interceded through the Belgian queen mother, eventually getting a personal envoy into the Oval Office. Roosevelt initially fobbed him off. He listened more closely at a second meeting over breakfast the next day, then made up his mind within minutes. "This needs action," he told his military aide. It was the birth of the Manhattan Project. As a result, the US had an atomic weapon early enough to deter Stalin from going too far in Europe. The global energy crunch needs equal "action". If it works, Manhattan II could restore American optimism and strategic leadership at a stroke: if not, it is a boost for US science and surely a more fruitful way to pull the US out of perma-slump than scattershot stimulus.

#### Federal production cost-incentives are key to widespread commercialization – learning benefits and aggregation of demand

Rosner & Goldberg 11 (Robert, William E. Wrather Distinguished Service Professor, Departments of Astronomy and Astrophysics, and Physics, and the College at the U of Chicago, and Stephen, Energy Policy Institute at Chicago, The Harris School of Public Policy Studies, "Small Modular Reactors - Key to Future Nuclear Power Generation in the U.S.," November 2011, [https://epic.sites.uchicago.edu/sites/epic.uchicago.edu/files/uploads/EPICSMRWhitePaperFinalcopy.pdf], jam)

As illustrated in the previous discussion, until significant learning benefits are achieved, the LEAD SMR plant and some number of FOAK SMR plants may not be competitive with new natural gas combined-cycle generation. Estimates of the number of SMR modules that may not be competitive and the magnitude of the difference in cost are subject to significant uncertainty. The estimates are dependent upon at least three key variables: the initial cost estimates 39 for the LEAD SMR design, the learning rate, and the future price of natural gas. 40 The potential range of uncertainty is illustrated in Figure 4, which identifies the generation cost differential ($/MWh) between the family of SMR plants (LEAD, FOAK, and NOAK) and gas-fired plants for a variety of natural gas price scenarios. This analysis adopts the 10% learning assumption and the overnight cost estimate of $4,700/kW. Assuming that early SMR deployments will carry cost premiums (until the benefits of learning are achieved), the issue is whether federal government incentives are needed to help overcome this barrier. Some may argue that commercial deployment will occur, albeit at a slower pace, as the cost of alternatives increases to a level that makes initial SMR deployments competitive. Others may argue that SMR vendors should market initial modules at market prices and absorb any losses until a sufficient number of modules are sold that will begin to generate a profit. However, the combination of the large upfront capital investment, the long period before a return on capital may be achieved, and the large uncertainty in the potential level of return on investment make it unlikely that SMRs will be commercialized without some form of government incentive. The present analysis assumes that government incentives will be essential to bridging this gap and accelerating private sector investment (see Appendix D). It is the study team’s understanding that DOE has proposed to share the cost of certain SMR design and licensing study activities. This section analyzes possible options for government incentives for early deployments (LEAD and FOAK plants) in addition to federal cost sharing for the design and licensing effort. The present analysis considers several alternative approaches to providing such incentives, either in the form of direct or indirect government financial incentives, or through market transformation actions that will spur demand for FOAK plants in competitive applications. The study team’s approach is to identify targeted, least-cost incentives that could form the basis for further dialogue between stakeholders and policy makers. Possible financial incentives need to be designed and evaluated relative to a particular management model for deployment of LEAD and FOAK plants. The study team’s management model assumes that these initial SMR plants will be managed and financed by the private sector, consisting of a possible consortium of the SMR vendor, the reactor module manufacturer, other major vendors, a host-site utility company, and one or more other electricity generation or vertically integrated utilities. The types of incentives that could be structured for this type of management model are discussed in the subsections that follow. Other management models were considered by the team. These alternative models would have a greater direct government role in the ownership, financing, and marketing of the SMR plant. Under a build-own-operate-transfer (BOOT) model, for example, the federal government would license, build, finance, and operate an SMR plant, and upon successful operation, seek to transfer ownership to the private sector. Another model would provide for the federal government to lease a privately developed SMR plant and take full responsibility for operation of the plant and marketing of the power generation. The various possible management models are described and contrasted further in Appendix E. Several forms of government support programs could assist the learning modules in reducing the cost differential, assuming competitive market conditions: x Capital Cost Incentive: A capital cost incentive would reduce the effective overnight capital cost through either direct government cost sharing or through an investment tax credit. 41 There are policy precedents for both. DOE provides direct cost sharing for demonstration projects involving FOAK coal generation technology under the Clean Coal Power Initiative (CCPI). Congress provided a capital cost incentive for renewable energy projects in the form of an Investment Tax Credit (ITC), which currently can be converted to an upfront cash grant. 42 Capital cost incentives help “buy down” the initial capital cost of SMR deployments, thus reducing the capital recovery requirements that would otherwise be reflected in the LCOE. A direct buy-down of the capital cost protects project sponsors against construction risk for SMRs by shifting a portion of that risk to the government. It also shifts performance risk from the project sponsor to the federal government, i.e., the federal government pays the capital cost incentive regardless of whether the project performs as planned or not. In the case of SMRs, shifting a portion of performance risk from the SMR community to the government also may adversely impact the risk-reward structure guiding the learning process. For example, a capital cost incentive for SMRs would be fixed, regardless of whether the investment achieved the estimated learning performance. Consequently, capital cost incentives were not incorporated into the business case analysis for SMRs. x Production Cost Incentive: A production cost incentive is a performance-based incentive. With a production cost incentive, the government incentive would be triggered only when the project successfully operates. The project sponsors would assume full responsibility for the upfront capital cost and would assume the full risk for project construction. The production cost incentive would establish a target price, a so-called “market-based benchmark.” Any savings in energy generation costs over the target price would accrue to the generator. Thus, a production cost incentive would provide a strong motivation for cost control and learning improvements, since any gains greater than target levels would enhance project net cash flow. Initial SMR deployments, without the benefits of learning, will have significantly higher costs than fully commercialized SMR plants and thus would benefit from production cost incentives. Because any production cost differential would decline rapidly due to the combined effect of module manufacturing rates and learning experience, the financial incentive could be set at a declining rate, and the level would be determined on a plant-by-plant basis, based on the achievement of cost reduction targets. 43 The key design parameters for the incentive include the following: The magnitude of the deployment incentive should decline with the number of SMR modules and should phase out after the fleet of LEAD and FOAK plants has been deployed. 2. The incentive should be market-based rather than cost-based; the incentive should take into account not only the cost of SMRs but also the cost of competing technologies and be set accordingly. 3. The deployment incentive could take several forms, including a direct payment to offset a portion of production costs or a production tax credit. The Energy Policy Act of 2005 authorized a production tax credit of $18/MWh (1.8¢/kWh) for up to 6,000 MW of new nuclear power plant capacity. To qualify, a project must commence operations by 2021. Treasury Department guidelines further required that a qualifying project initiate construction, defined as the pouring of safetyrelated concrete, by 2014. Currently, two GW-scale projects totaling 4,600 MW are in early construction; consequently, as much as 1,400 MW in credits is available for other nuclear projects, including SMRs. The budgetary cost of providing the production cost incentive depends on the learning rate and the market price of electricity generated from the SMR project. Higher learning rates and higher market prices would decrease the magnitude of the incentive; lower rates and lower market prices would increase the need for production incentives. Using two scenarios (with market prices based on the cost of natural gas combined-cycle generation) yields the following range of estimates of the size of production incentives required for the FOAK plants described earlier. For a 10% learning rate, ƒ Based on a market price of $60/MWh 44 (6¢/kWh), the LEAD plant and the subsequent eight FOAK plants would need, on average, a production credit of $13.60/MWh (1.4¢/kWh), 24% less than the $18 credit currently available to renewable and GW-scale nuclear technologies. (The actual credit would be on a sliding scale, with the credit for the LEAD plant at approximately $31/MWh, or 3.1¢/kWh, declining to a credit of about $6/MWh, or 0.6¢/kWh, by the time of deployment of FOAK-8). The total cost of the credit would be about $600 million per year (once all plants were built and operating). ƒ If the market price were about $70/MWh (7¢/kWh), the LEAD and only four subsequent FOAK plants would require a production incentive. In this case, the average incentive would be $8.40/MWh (0.8¢/kWh), with a total cost of about $200 million per year. Higher learning rates would drive down the size of the production incentive. For example, at a 12% learning rate, ƒ At a market price of $60/MWh (6¢/kWh), the LEAD and the subsequent five FOAK plants would require a production incentive, with an average incentive level of about $15/MWh (1.5¢/kWh). Total annual cost (after all plants are in full operation) would be about $450 million per year. ƒ At a market price of $70/MWh (7¢/kWh), the LEAD and three FOAK plants would require a production incentive averaging $9.00/MWh (0.9¢/kWh, half of the current statutory incentive), with a total annual cost of about $170 million per year. The range of costs for the production incentive illustrates the sensitivity of the incentive level to the learning rate and the market price of electricity. Thus, efforts to achieve higher learning rates, including fully optimized engineering designs for the SMRs and the manufacturing plant, as well as specially targeted market introduction opportunities that enable SMRs to sell electricity for higher priced and higher value applications, can have a critical impact on the requirements for production incentives. The potential size of the incentive should be subject to further analysis as higher quality cost estimates become available. x Loan Guarantees: Loan guarantees do not directly impact project capital costs, but guarantees facilitate the ability of the project sponsors to access capital at lower cost. The effect of the guarantee is to broaden the pool of potential equity and debt investors, and thus to lower the WACC of the project. The lower WACC is then reflected in a lower LCOE. Loan guarantees can be particularly effective in mitigating the risk premium typically associated with the financing of FOAK technology deployments. For example, federal loan guarantees are viewed as having a key role in mitigating the risk premium and lowering the WACC early-mover, GW-scale nuclear plants. As discussed earlier, the smaller investment requirements for the first-of-a-kind SMR plant (both the LEAD and one or more early FOAK plants) significantly reduce the risk premium that may otherwise be sought by private equity and debt holders; this reduced risk premium would obviate the need for loan guarantees. Appendix F discusses the relationship between size of investment relative to the size of the sponsor and its potential effect on risk premium. The business case analysis assumes that a robust SMR DD&E effort will mitigate the risk premium sufficiently so that loan guarantees will not be part of the incentive program. However, it is possible that a federal loan guarantee may be appropriate for the LEAD and the FOAK-1 plant. 45 Similar to other important energy technologies, such as energy storage and renewables, “market pull” activities coupled with the traditional “technology push” activities would significantly increase the likelihood of timely and successful commercialization. Market transformation incentives serve two important objectives. They facilitate demand for the off-take of SMR plants, thus reducing market risk and helping to attract private investment without high risk premiums. In addition, if such market transformation opportunities could be targeted to higher price electricity markets or higher value electricity applications, they would significantly reduce the cost of any companion production incentives. There are three special market opportunities that may provide the additional market pull needed to successfully commercialize SMRs: the federal government, international applications, and the need for replacement of existing coal generation plants. 6.2.1 Purchase Power Agreements with Federal Agency Facilities Federal facilities could be the initial customer for the output of the LEAD or FOAK SMR plants. The federal government is the largest single consumer of electricity in the U.S., but its use of electricity is widely dispersed geographically and highly fragmented institutionally (i.e., many suppliers and customers). Current federal electricity procurement policies do not encourage aggregation of demand, nor do they allow for agencies to enter into long-term contracts that are “bankable” by suppliers. President Obama has sought to place federal agencies in the vanguard of efforts to adopt clean energy technologies and reduce greenhouse gas emissions. Executive Order 13514, issued on October 5, 2009, calls for reductions in greenhouse gases by all federal agencies, with DOE establishing a target of a 28% reduction by 2020, including greenhouse gases associated with purchased electricity. SMRs provide one potential option to meet the President’s Executive Order. One or more federal agency facilities that can be cost effectively connected to an SMR plant could agree to contract to purchase the bulk of the power output from a privately developed and financed LEAD plant. 46 A LEAD plant, even without the benefits of learning, could offer electricity to federal facilities at prices competitive with the unsubsidized significant cost of other clean energy technologies. Table 4 shows that the LCOE estimates for the LEAD and FOAK-1plants are in the range of the unsubsidized national LCOE estimates for other clean electricity generation technologies (based on the current state of maturity of the other technologies). All of these technologies should experience additional learning improvements over time. However, as presented earlier in the learning model analysis, the study team anticipates significantly greater learning improvements in SMR technology that would improve the competitive position of SMRs over time. Additional competitive market opportunities can be identified on a region-specific, technology-specific basis. For example, the Southeast U.S. has limited wind resources. While the region has abundant biomass resources, the estimated unsubsidized cost of biomass electricity is in the range of $90-130 per MWh (9-13¢/kWh), making LEAD and FOAK plants very competitive (prior to consideration of subsidies). 47 Competitive pricing is an important, but not the sole, element to successful SMR deployment. A bankable contractual arrangement also is required, and this provides an important opportunity for federal facilities to enter into the necessary purchase power arrangements. However, to provide a “bankable” arrangement to enable the SMR project sponsor to obtain private sector financing, the federal agency purchase agreement may need to provide a guaranteed payment for aggregate output, regardless of actual generation output. 48 Another challenge is to establish a mechanism to aggregate demand among federal electricity consumers if no single federal facility customer has a large enough demand for the output of an SMR module. The study team believes that high-level federal leadership, such as that exemplified in E.O. 13514, can surmount these challenges and provide critical initial markets for SMR plants.

#### Plan bypasses licensing restrictions—causes rapid commercialization

Hunt 11 (Gary L, 30 years experience in the energy, software and information technology industries, Tech&Creative Labs, "Is there a Small Modular Nuke in our Distributed Energy Future?," May 31, [www.tclabz.com/2011/05/31/is-there-a-small-modular-nuke-in-our-distributed-energy-future/], jam)

What the US military needs according to Colonel Roege is clean, modular, transportable energy sources for forward operating bases, the lift to get them there and move them around, and a fast-track path to development and commercialization to supply them anywhere in the world. This Army Colonel said the US military already has a solution in mind based upon the experience of the US Navy. That solution is small scale, modular nuclear power plants like the ones used on aircraft carriers and submarines. Only the new version would be likely smaller, more portable and safer by design with passive safety systems. The Colonel says the military does not believe the NRC will license such a modular design anytime soon enough to meet the military need so he is recommending that the Department of Defense use its authority to license such technology for military purposes since doing so does not require NRC approval. Once proven and deployed, these military applications should speed the path to small modular nuclear units in civilian applications. GO ARMY! Speeding the development of transportable, small scale, safe microgrid solutions based upon small modular nuclear plants could transform the power system not just for the US military but for civilian applications as well. By substituting the economies of scale from modular design for the economy of scale from building large sized nuclear plants as was done in the first generation nukes, the hope is that nuclear energy will find a larger market share place in our clean energy economy. It may not be the fuel cell alchemy the military would love to have, but it is technology the military knows made better, safer and, they hope, cheaper by modern design and manufacturing methods. WHY THIS IS A DER BIG DEAL Transforming our energy future with clean, sustainable, low emission choices is the goal of much of our energy strategy today. In a distributed energy future we need more choices with greater efficiency than currently available from wind and solar. Small modular nuclear reactors meet that need and give both our military and potentially, a wide range of civilian applications the best available technology with the capability to displace coal and replace the first generation nuclear units as they retire.

#### We access cost-competitiveness

Hargraves and Moir ’10 Robert Hargraves, teaches energy policy at the Institute for Lifelong Education at Dartmouth, PhD in physics from Brown, and Ralph Moir, Sc.D. in nuclear engineering from MIT, published 10 papers on molten-salt reactors during his career at Lawrence Livermore National Laboratory, “Liquid Fluoride Thorium Reactors: An old idea in nuclear power gets reexamined,” American Scientist, Vol. 98, No. 4, July-August 2010, http://www.americanscientist.org/issues/feature/liquid-fluoride-thorium-reactors

In terms of cost, the ideal would be to compete successfully against coal without subsidies or market-modifying legislation. It may well be possible. Capital costs are generally higher for conventional nuclear versus fossil-fuel plants, whereas fuel costs are lower. Capital costs are outsized for nuclear plants because the construction, including the containment building, must meet very high standards; the facilities include elaborate, redundant safety systems; and included in capital costs are levies for the cost of decommissioning and removing the plants when they are ultimately taken out of service. The much-consulted MIT study The Future of Nuclear Power, originally published in 2003 and updated in 2009, shows the capital costs of coal plants at $2.30 per watt versus $4 for light-water nuclear. A principal reason why the capital costs of LFTR plants could depart from this ratio is that the LFTR operates at atmospheric pressure and contains no pressurized water. With no water to flash to steam in the event of a pressure breach, a LFTR can use a much more close-fitting containment structure. Other expensive high-pressure coolant-injection systems can also be deleted. One concept for the smaller LFTR containment structure is a hardened concrete facility below ground level, with a robust concrete cap at ground level to resist aircraft impact and any other foreseeable assaults. Other factors contribute to a favorable cost structure, such as simpler fuel handling, smaller components, markedly lower fuel costs and significantly higher energy efficiency. LFTRs are high-temperature reactors, operating at around 800 degrees Celsius, which is thermodynamically favorable for conversion of thermal to electrical energy—a conversion efficiency of 45 percent is likely, versus 33 percent typical of coal and older nuclear plants. The high heat also opens the door for other remunerative uses for the thermal energy, such as hydrogen production, which is greatly facilitated by high temperature, as well as driving other industrial chemical processes with excess process heat. Depending on the siting of a LFTR plant, it could even supply heat for homes and offices. Thorium must also compete economically with energy-efficiency initiatives and renewables. A mature decision process requires that we consider whether renewables and efficiency can realistically answer the rapidly growing energy needs of China, India and the other tiers of the developing world as cheap fossil fuels beckon—at terrible environmental cost. Part of the cost calculation for transitioning to thorium must include its role in the expansion of prosperity in the world, which will be linked inexorably to greater energy demands. We have a pecuniary interest in avoiding the enviromental blowback of a massive upsurge in fossil-fuel consumption in the developing world. The value of providing an alternative to that scenario is hard to monetize, but the consequences of not doing so are impossible to hide from. Perhaps the most compelling idea on the drawing board for pushing thorium-based power into the mainstream is mass production to drive rapid deployment in the U.S. and export elsewhere. Business economists observe that commercialization of any technology leads to lower costs as the number of units increases and the experience curve delivers benefits in work specialization, refined production processes, product standardization and efficient product redesign. Given the diminished scale of LFTRs, it seems reasonable to project that reactors of 100 megawatts can be factory produced for a cost of around $200 million. Boeing, producing one $200 million airplane per day, could be a model for LFTR production. Modular construction is an important trend in current manufacturing of traditional nuclear plants. The market-leading Westinghouse AP1000 advanced pressurized-water reactor can be built in 36 months from the first pouring of concrete, in part because of its modular construction. The largest module of the AP1000 is a 700-metricton unit that arrives at the construction site with rooms completely wired, pipefitted and painted. Quality benefits from modular construction because inspection can consist of a set of protocols executed by specialists operating in a dedicated environment. One potential role for mass-produced LFTR plants could be replacing the power generation components of existing fossil-fuel fired plants, while integrating with the existing electrical-distribution infrastructure already wired to those sites. The savings from adapting existing infrastructure could be very large indeed.

#### Transition takes 30 months

Sorensen 11 (Kirk, studying thorium technology since 2000 and has been a public advocate for its use and development since 2006, masters’ degree in aerospace engineering from the Georgia Institute of Technology and is studying nuclear engineering at the University of Tennessee under Dr. Laurence Miller, May 28, [www.financialsense.com/financial-sense-newshour/big-picture/2011/05/28/03/kirk-sorensen/thorium-could-be-our-energy-silver-bullet], jam)

Jim: (32:00) Let me throw another idea, and I've often had this conversation, with the late Matt Simmons, who was a big believer in peak oil, and was kind of looking for that silver bullet. And that is, could it take a crisis? I know in the midst of a crisis, World War II, you know, we discovered nuclear power and also weapon grade uranium in the Manhattan project where we basically produced a bomb in a short period of time. So if we were faced with a severe energy crisis, global warming, or just shortages of fuel, could we turn this into a Manhattan project and turn thorium? In other words, how quickly can we turn the table and really start to get this thing running? Kirk: (32:47) If we were talking Manhattan project, and that’s where you're taking the smartest people out of society. You’re putting them in a place and they work on it six days a week, 18 hours a day, we could probably have one of these reactors up and running within 18 months. And we could be to a production level within a year or so after that. I mean, it would be a lot like World War II. Imagine the factories turning out B-29 bombers, you know, it would be like that. Jim: (33:11) Wow. Kirk: (33:11) Now Manhattan style projects, that’s a severe disruption though, to the flow society. That is a heavy governmental hand reaching and deciding how to allocate resources. And that’s really not what I would hope would happened. What I would hope would happen would be a much more market-driven approach where a fair and clear regulatory environment allows businesses and investors to make wise decisions, with a high certainty that if they fulfill the obligations laid out, and the regulations, they will be able to build and operate the machines they have designed. In that scenario, which I would call more the skunk works approach, having worked at Lockheed when I was younger, I think we could have this ready in four or five years. With abundant private financing and a clear and realistic regulatory environment. That's not really the world we live in right now. Now that may change, but that's not how it is right now. Right now we have a regulatory challenge and we are looking for ways to move the technology forward under situations that have a stronger need for the technology. For instance, the military's need for base islanding, and so, in that scenario that does stretch out the time. But I guess maybe I’m getting past your original question, which was could we do this in a Manhattan style project, and the answer is absolutely yes. And it would go quite quickly.

#### Thorium can be introduced into existing nuclear fuel cycles

IAEA ‘5 “Thorium fuel cycle — Potential benefits and challenges,” International Atomic Energy Agency, Nuclear Fuel Cycle and Materials Section, May 2005, http://www-pub.iaea.org/mtcd/publications/pdf/te\_1450\_web.pdf

Several thorium-based fuel design options investigated in recent years [28], have demonstrated the basic feasibility of Th–based fuel cycles for light water reactor (LWRs) of current and next generation technology. Activities have focused on examining the Th–233 U cycle as a replacement for conventional uranium-based fuels in existing LWRs, as well as a way to manage the growth of plutonium stockpiles by burning plutonium, or achieving a “net zero production,” sustainable re-cycle scenario. The fuel has to be designed to withstand very high burnup (above 100 000 MWd/kg). The fuel cycle costs are similar to those of conventional fuel. Two main implementation scenarios have been the focus of recent studies for pressurized water reactors (PWRs): homogeneous and heterogeneous. The homogeneous designs employ a mixture of ThO2 UO2, within each fuel rod, with uranium volume fraction and enrichment sufficient to obtain the required burnup and cycle length. The heterogeneous designs consider a seed-blanket approach, where U and Th fuel parts are spatially separated either within a given assembly, or between assemblies. The homogeneous studies have also considered “micro heterogeneous” schemes where the uranium and thorium fuel are spatially separated within a given fuel rod. Two heterogeneous options have been examined under the Nuclear Energy Research Initiative (NERI) funded by the United States Department of Energy. The two approaches are: 1) the Seed-Blanket Unit (SBU, also known as the Radkowsky Thorium Fuel (RTF)) concept, which employs a seed-blanket unit that is a one-for-one replacement for a conventional PWR fuel assembly; and 2) the whole assembly seed and blanket (WASB), where the seed and blanket units each occupy one full-size PWR assembly and the assemblies are arranged in the core in a modified checkerboard array (Fig. 2). The SBU and WASB approaches are both new fuel assembly designs, not new reactors, and are intended to be retrofittable into existing PWRs/WWERs with minimum changes to existing systems/hardware. In order to be attractive/receive serious consideration, they should also be competitive economically, and have characteristics comparable to those of existing LWRs (i.e., within the current “safety envelope”).

#### DOE already announced specific SMR grants

Halper 12/3 (Mark, writer for the Weinberg Foundation, UK-based not-for-profit organisation dedicated to advancing the research, development and deployment of safe, clean and affordable nuclear energy technologies to combat climate change and underpin sustainable development for the world , "‘Small’ step forward for alternative nuclear: U.S. Dept. of Energy funds Babcock & Wilcox modular reactor" 2012, [www.the-weinberg-foundation.org/2012/12/03/small-step-forward-for-alternative-nuclear-u-s-dept-of-energy-funds-babcock-wilcox-modular-reactor/])

Neither DOE nor B&W would disclose the amount of funding DOE is providing. Various published reports including in the Charlotte Business Journal (Charlotte, North Carolina) and Oilprice.com pegged it at $225 million. “Through a five-year cost-share agreement, the Energy Department will invest up to half of the total project cost, with the project’s industry partners matching this investment by at least one-to-one,” DOE’s press release states. “The specific total will be negotiated between the Energy Department and Babcock & Wilcox.” The award was part of a project to fund $450 million of SMR development that DOE announced last March, so the $225 million would represent half of that programme. The New York Times had a more modest sense of the funding, noting, “At one point it (DOE) anticipated a $452 million program over five years, but so far Congress has appropriated only $67 million. The department is asking for another $65 million for the fiscal year that began on Oct. 1. Also, the department has not said how much it was providing to Babcock & Wilcox.” B&W CEO James Ferland welcomed the funding. “With this public-private partnership, the DOE is providing important national leadership for America in the global pursuit of SMR technology,” he said. “This partnership is essential to reestablishing our nation’s international competitiveness in the nuclear energy industry, as well as enhancing U.S. manufacturing infrastructure and energy independence. “ The company wasted no time in demonstrating momentum. About a week after winning the funding, it announced it had contracted Bethlehem, Pennsylvania-based Lehigh Heavy Forge Corp. to fabricate the shell.

## 2AC

### Grid Adv

#### Prolonged grid outage wrecks military command and control – escalates from both retaliation and deterrence collapse

Tilford 12 (Robert, Former soldier US Army, infantry, "Cyber attackers could shut down the electric grid for the entire east coast," Jul 27, [www.examiner.com/article/cyber-attackers-could-easily-shut-down-the-electric-grid-for-the-entire-east-coa])

The devastation that the Senator describes is truly unimaginable. To make matters worse a cyber attack that can take out a civilian power grid, for example could also cripple the U.S. military. The senator notes that is that the same power grids that supply cities and towns, stores and gas stations, cell towers and heart monitors also power “every military base in our country.” “Although bases would be prepared to weather a short power outage with backup diesel generators, within hours, not days, fuel supplies would run out”, he said. Which means military command and control centers could go dark. Radar systems that detect air threats to our country would shut Down completely. “Communication between commanders and their troops would also go silent. And many weapons systems would be left without either fuel or electric power”, said Senator Grassley. “So in a few short hours or days, the mightiest military in the world would be left scrambling to maintain base functions”, he said. We contacted the Pentagon and officials confirmed the threat of a cyber attack is something very real. Top national security officials—including the Chairman of the Joint Chiefs, the Director of the National Security Agency, the Secretary of Defense, and the CIA Director— have said, “preventing a cyber attack and improving the nation’s electric grids is among the most urgent priorities of our country” (source: Congressional Record). So how serious is the Pentagon taking all this? Enough to start, or end a war over it, for sure (see video: Pentagon declares war on cyber attacks http://www.youtube.com/watch?v=\_kVQrp\_D0kY&feature=relmfu ). A cyber attack today against the US could very well be seen as an “Act of War” and could be met with a “full scale” US military response. That could include the use of “nuclear weapons”, if authorized by the President.

#### SMRs are key to grid invulnerability – renewables are a step back

Barton 11 (Charles, founder of the Nuclear Green Revolution blog, MA in philosophy, “Future storm damage to the grid may carry unacceptable costs”, April 30, http://nucleargreen.blogspot.com/2011\_04\_01\_archive.html)

Amory Lovins has long argued that the traditional grid is vulnerable to this sort of damage. Lovins proposed a paradigm shift from centralized to distributed generation and from fossil fuels and nuclear power to renewable based micro-generation. Critics have pointed to flaws in Lovins model. Renewable generation systems are unreliable and their output varies from locality to locality, as well as from day to day, and hour to hour. In order to bring greater stability and predictability to the grid, electrical engineers have proposed expanding the electrical transmission system with thousands of new miles of transmission cables to be added to bring electricity from high wind and high sunshine areas, to consumers. This would lead, if anything, to greater grid vulnerability to storm damage in a high renewable penetration situation. Thus Lovins renewables/distributed generation model breaks down in the face of renewables limitations. Renewables penetration, will increase the distance between electrical generation facilities and customer homes and businesses, increasing the grid vulnerable to large scale damage, rather than enhancing reliability. Unfortunately Lovins failed to note that the distributed generation model actually worked much better with small nuclear power plants than with renewable generated electricity. Small nuclear plants could be located much closer to customer's homes, decreasing the probability of storm damage to transmission lines. At the very worst, small NPPs would stop the slide toward increased grid expansion. Small reactors have been proposed as electrical sources for isolated communities that are too remote for grid hookups. If the cost of small reactors can be lowered sufficiently it might be possible for many and perhaps even most communities to unhook from the grid while maintaining a reliable electrical supply. It is likely that electrical power will play an even more central role in a post-carbon energy era. Increased electrical dependency requires increased electrical reliability, and grid vulnerabilities limit electrical reliability. Storm damage can disrupt electrical service for days and even weeks. In a future, electricity dependent economy, grid damage can actually impede storm recovery efforts, making large scale grid damage semi-self perpetuating. Such grid unreliability becomes a threat to public health and safety. Thus grid reliability will be a more pressing future issue, than it has been. It is clear that renewable energy sources will worsen grid reliability, Some renewable advocates have suggested that the so called "smart grid" will prevent grid outages. Yet the grid will never be smart enough to repair its own damaged power lines. In addition the "smart grid" will be venerable to hackers, and would be a handy target to statures. A smart grid would be an easy target for a Stuxnet type virus attack. Not only does the "smart grid" not solve the problem posed by grid vulnerability to storm damage, but efficiency, another energy approach thought to be a panacea for electrical supply problems would be equally useless. Thus, decentralized electrical generation through the use of small nuclear power plants offers real potential for increasing electrical reliability, but successful use of renewable electrical generation approaches may worsen rather than improved grid reliability.

#### Intermittency and land

Loudermilk 11 Micah J. Loudermilk, Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University, 5/31/11, Small Nuclear Reactors and US Energy Security: Concepts, Capabilities, and Costs, www.ensec.org/index.php?option=com\_content&view=article&id=314:small-nuclear-reactors-and-us-energy-security-concepts-capabilities-and-costs&catid=116:content0411&Itemid=375

When discussing the energy security contributions offered by small nuclear reactors, it is not enough to simply compare them with existing nuclear technology, but also to examine how they measure up against other electricity generation alternatives—renewable energy technologies and fossil fuels. Coal, natural gas, and oil currently account for 45%, 23% and 1% respectively of US electricity generation sources. Hydroelectric power accounts for 7%, and other renewable power sources for 4%. These ratios are critical to remember because idealistic visions of providing for US energy security are not as useful as realistic ones balancing the role played by fossil fuels, nuclear power, and renewable energy sources. Limitations of renewables Renewable energy technologies have made great strides forward during the last decade. In an increasingly carbon emissions and greenhouse gas (GHG) aware global commons, the appeal of solar, wind, and other alternative energy sources is strong, and many countries are moving to increase their renewable electricity generation. However, despite massive expansion on this front, renewable sources struggle to keep pace with increasing demand, to say nothing of decreasing the amount of energy obtained from other sources. The continual problem with solar and wind power is that, lacking efficient energy storage mechanisms, it is difficult to contribute to baseload power demands. Due to the intermittent nature of their energy production, which often does not line up with peak demand usage, electricity grids can only handle a limited amount of renewable energy sources—a situation which Germany is now encountering. Simply put, nuclear power provides virtually carbon-free baseload power generation, and renewable options are unable to replicate this, especially not on the scale required by expanding global energy demands. Small nuclear reactors, however, like renewable sources, can provide enhanced, distributed, and localized power generation. As the US moves towards embracing smart grid technologies, power production at this level becomes a critical piece of the puzzle. Especially since renewable sources, due to sprawl, are of limited utility near crowded population centers, small reactors may in fact prove instrumental to enabling the smart grid to become a reality.

### Prolif Adv

#### Bilateral talks this year—best sources

Katz 1-4 Lee Michael Katz, “Q&A: Ex-Veteran Diplomat Says 2013 Could Bring U.S.-Iran Nuclear Talks,” Global Security Newswire, 1/4/2013, http://www.nti.org/gsn/article/q-veteran-diplomat-says-2013-could-bring-us-iran-nuclear-talks/

WASHINGTON -- The new year could bring “the first serious, substantive, sustained” direct negotiations between the United States and Iran in decades over Tehran’s controversial Iranian nuclear program, according to a former undersecretary of State. “I do believe that 2013 will be a consequential year for the Iran nuclear crisis,” former Undersecretary of State for Political Affairs Nicholas Burns said in an interview. “There’s also a reasonable chance that we might have some bilateral negotiations with Iran -- the first serious, substantive, sustained bilateral negotiations since the Jimmy Carter administration,” he told Global Security Newswire. There are no publicly announced direct U.S.-Iran talks on Iran’s nuclear program. Currently, the United States participates in P-5+1 talks with Iran through a coalition of the five permanent U.N. Security Council members and Germany. Following three rounds of talks in 2012, reports have suggested another meeting could be in the offing with the objective of resolving concerns over Iran’s nuclear work. Of particular concern is uranium enrichment that could be used to produce nuclear weapons material; Iran insists it has no military atomic program. Burns noted direct talks could give the United States a better feel for the intentions of Iran and its supreme leader, Ayatollah Ali Khamenei. “We don’t know whether or not he’s willing to make some fundamental compromises here and to pull back from the progress that Iran is making on enrichment,” according to the veteran diplomat. “And so, negotiations would give us the answer to that question.” Direct talks, he argued, would also show the world the United States had taken “the last steps possible towards peace” before any potential use of military force against Iran. “Of course, the Obama administration, I’m quite sure, would not give up the threat of force and the possibility of the use of force should that be necessary,” Burns added. Burns handled the Iran nuclear issue as undersecretary of State for political affairs, retiring from that post as the third-ranking official in the State Department in 2008. The undersecretary position capped a diplomatic career that also included serving as State Department spokesman and U.S. ambassador to NATO.

### T—“Fiscal Incentives”

#### We meet—production cost incentives are financial incentives in context of SMRs

Rosner & Goldberg 11 (Robert, William E. Wrather Distinguished Service Professor, Departments of Astronomy and Astrophysics, and Physics, and the College at the U of Chicago, and Stephen, Energy Policy Institute at Chicago, The Harris School of Public Policy Studies, "Small Modular Reactors - Key to Future Nuclear Power Generation in the U.S.," November 2011, [https://epic.sites.uchicago.edu/sites/epic.uchicago.edu/files/uploads/EPICSMRWhitePaperFinalcopy.pdf], jam)

Production Cost Incentive: A production cost incentive is a performance-based incentive. With a production cost incentive, the government incentive would be triggered only when the project successfully operates. The project sponsors would assume full responsibility for the upfront capital cost and would assume the full risk for project construction. The production cost incentive would establish a target price, a so-called “market-based benchmark.” Any savings in energy generation costs over the target price would accrue to the generator. Thus, a production cost incentive would provide a strong motivation for cost control and learning improvements, since any gains greater than target levels would enhance project net cash flow. Initial SMR deployments, without the benefits of learning, will have significantly higher costs than fully commercialized SMR plants and thus would benefit from production cost incentives. Because any production cost differential would decline rapidly due to the combined effect of module manufacturing rates and learning experience, the financial incentive could be set at a declining rate, and the level would be determined on a plant-by-plant basis, based on the achievement of cost reduction targets. 43 The key design parameters for the incentive include the following: 1. The magnitude of the deployment incentive should decline with the number of SMR modules and should phase out after the fleet of LEAD and FOAK plants has been deployed. 2. The incentive should be market-based rather than cost-based; the incentive should take into account not only the cost of SMRs but also the cost of competing technologies and be set accordingly. 3. The deployment incentive could take several forms, including a direct payment to offset a portion of production costs or a production tax credit. The Energy Policy Act of 2005 authorized a production tax credit of $18/MWh (1.8¢/kWh) for up to 6,000 MW of new nuclear power plant capacity. To qualify, a project must commence operations by 2021. Treasury Department guidelines further required that a qualifying project initiate construction, defined as the pouring of safety-related concrete, by 2014. Currently, two GW-scale projects totaling 4,600 MW are in early construction; consequently, as much as 1,400 MW in credits is available for other nuclear projects, including SMRs.

#### Financial incentives are direct disbursements of funds to encourage behavior

Webb ’93 Kernaghen Webb, sessional lecturer with the Faculty of Law at the University of Ottowa, “Thumbs, Fingers, and Pushing on String: Legal Accountability in the Use of Federal Financial Incentives,” Alta Law Review, 31 Alta. L. Rev. 501 (1993)

One of the obstacles to intelligent discussion of this topic is the tremendous potential for confusion about what is meant by several of the key terms involved. In the hopes of contributing to the development of a consistent and precise vocabulary applying to this important but understudied area of regulatory activity, various terms are defined below. In this paper, "financial incentives" are taken to mean disbursements18 of public funds or contingent commitments to individuals and organizations, intended to encourage, support or induce certain behaviours 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 behaviour 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 And, needless to say, the comments made herein concerning accountability apply to differing degrees depending upon the type of incentive under consideration. By limiting the definition of financial incentives to initiatives where public funds are either disbursed or contingently committed, a large number of regulatory programs with incentive effects which exist, but in which no money is forthcoming,23 are excluded from direct examination in this paper. Such programs might be referred to as indirect incentives. Through elimination of indirect incentives from the scope of discussion, the definition of the incentive instrument becomes both more manageable and more particular. Nevertheless, it is possible that much of the approach taken here may be usefully applied to these types of indirect incentives as well.24 Also excluded from discussion here are social assistance programs such as welfare and ad hoc industry bailout initiatives because such programs are not designed primarily to encourage behaviours in furtherance of specific public policy objectives. In effect, these programs are assistance, but they are not incentives.

#### Cash production incentives are uniquely predictable—confirmed by DEO program language

The Law ‘12 -- US Code of Federal Regulation , 2012, 10 CFR 451 – “RENEWABLE ENERGY PRODUCTION INCENTIVES,”

§ 451.9 Procedures for processing applications. (a) Supplemental information. DOE may request supplementary information relating to the application. (b) Audits. DOE may require the applicant to conduct at its own expense and submit an independent audit, or DOE may conduct an audit, to verify the number of kilowatt-hours claimed to have been generated and sold by the qualified renewable energy facility and for which an incentive payment has been requested or made. (c) DOE determinations. The Assistant Secretary for Energy Efficiency and Renewable Energy shall determine the extent to which appropriated funds are available to be obligated under this program for each fiscal year. Upon evaluating each application and any other relevant information, DOE shall further determine: (1) Eligibility of the applicant for receipt of an incentive payment, based on the criteria for eligibility specified in this part; (2) The number of kilowatt-hours to be used in calculating a potential incentive payment, based on the net electric energy generated from a qualified renewable energy source at the qualified renewable energy facility and sold during the prior fiscal year; (3) The number of kilowatt-hours to be used in calculating a potential additional incentive payment, based on the total quantity of accrued energy generated during prior fiscal years; (4) The amounts represented by 60 percent of available funds and by 40 percent of available funds; and (5) Whether justification exists for altering the 60:40 payment ratio specified in paragraph (e) of this section. If DOE intends to modify the 60:40 ratio, the Department shall notify Congress, setting forth reasons for such change. (d) Calculating payments. Subject to the provisions of paragraph (e) of this section, potential incentive payments under this part shall be determined by multiplying the number of kilowatt- hours determined under §451.9(c)(2) by 1.5 cents per kilowatt-hour, and adjusting that product for inflation for each fiscal year beginning after calendar year 1993 in the same manner as provided in section 29(d)(2)(B) of the Internal Revenue Code of 1986, except that in applying such provisions calendar year 1993 shall be substituted for calendar year 1979. Using the same procedure, a potential additional payment shall be determined for the number of kilowatt-hours determined under paragraph (c)(3) of this section. If the sum of these calculated payments does not exceed the funds determined to be available by the Assistant Secretary for Energy Efficiency and Renewable Energy under §451.9(c), DOE shall make payments to all qualified applicants.

### Debt Ceiling DA

#### Hagel exhausts Obama’s PC

Star-Ledger 1/6 (“Hagel takes fire from the Hill” <http://www.nj.com/us-politics/index.ssf/2013/01/hagel_takes_fire_from_hill.html>)

Even Senate Democrats are privately signaling they're not yet on board with the Hagel pick, and that the White House has a lot of work to do to get him across the finish line.¶ The nomination comes at a tricky time for the administration -- just as the fights over raising the debt ceiling and government appropriations are set to begin. And it could put a number of at-risk or pro-Israel Democrats in tough political spots -- especially if the nomination fight grows even more contentious.¶ Democrats are also scratching their heads over why Obama appears willing to go to the mat for Hagel, while abandoning his push for a close friend and member of his inner circle, U.N. Ambassador Susan Rice, to become secretary of state. Rice, an unabashed Democrat, abandoned her bid after withering GOP criticism over the deadly attacks on the U.S. Consulate in Libya.¶ Though different in substance, the controversy over Rice's remarks is not unlike the current pushback over Hagel's past foreign policy positions and controversial remarks. But Hagel lacks a natural constituency in the Senate, given that he's grown alienated from the GOP, yet Democrats are suspicious of his record.¶ "It is a strange signal for the White House to send that they are willing to fight for Hagel but not Rice," one Senate Democratic aide said Sunday. "Democrats are not currently unified behind Hagel, and it will take some real work by the administration to get them there, if it's even possible."¶ Senior Republicans agreed, noting that after Hagel infuriated Republicans and Democrats alike over the years, there isn't a natural base for him.¶ "I can't imagine why [Obama] would choose to burn his political capital on this nomination. For what? There is no constituency for Chuck Hagel," one senior GOP aide said. "Obama will expend every ounce of political capital he has to get him across the finish line. Dems will hate this."

#### No compromise – tax standstill

Kephart 1/3 (Tim, CBS News, Washington prepares for next fiscal fight” <http://miami.cbslocal.com/2013/01/03/washington-prepares-for-next-fiscal-fight/>)

That sets the stage for the coming debt ceiling fight near the end of February, when the Treasury Department can no longer take any measures to stave off default.¶ President Barack Obama has said repeatedly that he will not negotiate with Congressional Republicans over the debt ceiling. President Obama said if Republicans were demanding massive spending cuts to discretionary spending and entitlements; he expects more tax revenues through tax reform.¶ Republican Senate Minority Leader Mitch McConnell said the fiscal cliff tax deal was the last word on taxes and Republicans would not agree to any more tax hikes for any reason, according to talkingpointsmemo.com.¶ Congressional Republicans see the debt ceiling as a form of revenge against President Obama and Democrats for having to swallow the tax increases included in the fiscal cliff deal. Republicans said the debt ceiling is the only leverage they have to force spending cuts through the government, according to the Washington Post.

#### No polcap and gridlock inevitable—declining cooperation and Obama credibility

McGregor 1-3 Richard McGregor, “Fiscal fights threaten US policy goals,” CNN, 1/3/2013, http://www.cnn.com/2013/01/03/business/us-fiscal-fight/

The measured peace offering from Mr Obama to Republicans in Congress, however, will run up against a much more rancorous reality on Capitol Hill and promises to make any second-term gains painfully difficult. The confrontation over the fiscal cliff legislation, which Mr Obama signed into law late on Wednesday night, has further undermined relations between Mr Obama and his most important negotiating partner in Congress, John Boehner, the Republican House speaker. "I don't think either of them regards the other as being able to deliver his own troops," said William Galston, a former Clinton administration official, now at the Brookings Institution. Within Congress, relations between the Democratic and Republican Senate leaders, Harry Reid and Mitch McConnell, two old warhorses who can usually find ways to do business, also foundered in the fiscal cliff talks. In the short term, fiscal fights will dominate politics for months to come and threaten to crowd out serious consideration of other issues, with a large potential downside for the economy in 2013. The fiscal cliff compromise alone will act as a drag on the economy, largely because of the end of the payroll tax holiday, which had added substantially to middle-class incomes, economists said. "The economy needs a stimulus, but under the agreement, taxes will go up in 2013 relative to 2012," said William Gale of the Tax Policy Center in Washington in a blog post. "For most households, the payroll tax takes a far bigger bite than the income tax does, and the payroll tax cut therefore was a more effective stimulus than income tax cuts were." The forthcoming confrontations will probably have a similar impact, as Republicans feel they enter talks over raising the debt ceiling in the coming weeks playing a far stronger hand than they had in the fiscal cliff. Under the fiscal cliff, taxes were going up no matter what Republicans did. The debt ceiling, however, cannot be lifted unless they vote for it. Dave Camp, who chairs the congressional committee overseeing tax policy, said that House Republicans had not settled on a strategy for the debt ceiling but the central aim was to leverage it to cut spending further. "Before we raise the debt limit we have to reduce spending," Mr Camp said. Many Republicans are less diplomatic in private and see the debt ceiling fight as a chance to get revenge both on the White House and the dealmakers within their own party for being forced into accepting a tax increase this week. Of all the issues crowding Mr Obama's agenda, immigration has the best hope of passing in some form, as the disastrous vote recorded by Republicans among minorities in 2012 gives them a huge incentive to address the issue. But on everything else, with the Republicans remaining in control of the House, Mr Obama needs all the skills of cajoling, seducing and manipulating Congress that he has so far shown no signs of developing. "I find it remarkable that the president apparently continues to believe that he will not have to deal with people that he does not agree with," said Mr Galston. "A president who is not disdainful of the art of legislating can get things done." Forging a consensus on issues such as gun control and climate change, if the White House does take them on, will require Mr Obama to do more than just persuade some Republicans to support him. Many Democrats are wary of such reforms or oppose them outright, and a second-term president with declining political capital will face an uphill battle to shift their views.

#### Plan is uniquely insulated from politics – bipartisan consensus

Shaw 12 (Andrew, member of the Government Affairs team where he focuses primarily on energy issues at the intersection of Canada-U.S. relations, uses his knowledge and experience of Congress and the Executive Branch to advise clients on critical energy and environmental public policy issues, “ A “Chunks” Approach to Climate Policy,” 2012, [[www.politicsandlawblog.com/2012/05/15/a-chunks-approach-to-climate-policy/](http://www.politicsandlawblog.com/2012/05/15/a-chunks-approach-to-climate-policy/)], jam)

While ideally President Obama would seek a “comprehensive” approach to climate change, Zichal acknowledged that the Administration would likely approach this issue in “chunks.” Specifically, Zichal talked about seeking “tools and policies that can garner bipartisan support.” One example provided by Zichal was extending the production tax credit for renewable production, which is set to expire at the end of this year. The “chunks” mention appears to reinforce the notion that President Obama would be unlikely to pursue cap-and-trade, or some variant, in a second-term. Following Zichal’s comments, Senator Lamar Alexander (R-TN) spoke – his remarks suggested that there are other “chunks” where consensus is achievable on energy policy between the Administration and Congress. Specifically, Senator Alexander expressed support for the Advanced Research Projects Agency-Energy (ARPA-E), an agency focused on R&D for breakthrough energy technologies, such as small modular reactors, smart grids, carbon capture and electric car batteries. ARPA-E is modeled after the Defense Advanced Research Projects Agency (DARPA), which, among other achievements, helped in inventing the internet. The American Recovery and Reinvestment Act provided the first appropriations for ARPR-E, which has subsequently used that money to fund over 180 projects focused on emerging energy technologies. In an election year, Republicans and Democrats spend an inordinate amount of time highlighting their differences on energy policy. Yet on ARPA-E, both President Obama and Governor Mitt Romney have expressed support for a continued commitment to the program. Senator Alexander’s comments indicate that an important and achievable “chunk” of climate policy, regardless of the outcome of the election, could be a renewed emphasis on ARPA-E.

#### DoD shields link

Lacey 8/16 (Stephen, reporter Climate Progress, B.A. in journalism from Franklin Pierce University, 2012, [thinkprogress.org/climate/2012/08/16/699811/the-solyndra-standard-on-loan-guarantees-military-spending-and-clean-energy-politics/?mobile=nc], jam)

That’s exactly how it’s playing out. The politically-manufactured outrage over Solyndra has turned into an all-out campaign — with tens of millions of dollars being spent this election season specifically targeting federal renewable energy investments. Mitt Romney has jumped on the bandwagon, using Solyndra as a central piece of his campaign. And here’s the really astonishing disconnect: While supporting tens of thousands of jobs, the loan guarantee program is expected to cost $2 billion less than Congress budgeted for, according to an analysis from Herb Allison, John McCain’s former National Finance Chairman. Meanwhile, amidst the Solyndra saga, we casually accept a $300 million aircraft failure without batting an eye. No outrage. No sustained political campaign. It’s just another day testing our military toys. Why? Because we don’t often see programs like this as a “failure” in the political arena. We would never use one failure as an excuse to abandon investment in new technologies. Most politicians accept losses in military R&D expenditures because the long-term gains are potentially so important for national defense and for eventually developing technologies for civilian use. We should always strive to make programs as efficient and cost-effective as possible. But a few bankrupt clean energy companies representing a fraction of the program’s budgeted cost is no excuse for abandoning federal investments in clean energy — a strategically important sector that is becoming one of the largest drivers of business this century. Alas, don’t expect anyone to publicly admit this. As the campaign season unfolds, political leaders are all too willing to practice the Solyndra standard.

#### No impact- printing money solves debt

Krugman 1/2 (Paul, Nobel economist @ Princeton, “Debt in a Time of Zero” NYT <http://krugman.blogs.nytimes.com/2013/01/02/debt-in-a-time-of-zero/>)

I’ve had communications from a number of people asking an interesting question relating to the debt ceiling and other issues: why does the Federal government have to borrow at all? Why can’t it just print money to pay its bills? After all, haven’t people like me been saying that this isn’t actually inflationary?¶ Now, it turns out that there really is a problem, or actually two problems — but they’re a bit subtle.¶ First, as a legal matter the Federal government can’t just print money to pay its bills, with one peculiar exception. Instead, money has to be created by the Federal Reserve, which then puts it into circulation by buying Federal debt. You may say that this is an artificial distinction, because the Fed is effectively part of the government; but legally, the distinction matters, and the debt bought by the Fed counts against the debt ceiling.¶ The peculiar exception is that clause allowing the Treasury to mint platinum coins in any denomination it chooses. Of course this was intended as a way to issue commemorative coins and stuff, not as a fiscal measure; but at least as I understand it, the letter of the law would allow Treasury to stamp out a platinum coin, say it’s worth a trillion dollars, and deposit it at the Fed — thereby avoiding the need to issue debt.¶ In reality, to pursue the thought further, the coin really would be as much a Federal debt as the T-bills the Fed owns, since eventually Treasury would want to buy it back. So this is all a gimmick — but since the debt ceiling itself is crazy, allowing Congress to tell the president to spend money then tell him that he can’t raise the money he’s supposed to spend, there’s a pretty good case for using whatever gimmicks come to hand.

#### No risk or impact to economic decline

Drezner ‘11 Daniel W. Drezner, professor of international politics at the Fletcher School of Law and Diplomacy at Tufts University, “Please come down off the ledge, dear readers,” Foreign Policy, 8/12/11, http://drezner.foreignpolicy.com/posts/2011/08/12/please\_come\_down\_off\_the\_ledge\_dear\_readers

So, when we last left off this debate, things were looking grim. My concern in the last post was that the persistence of hard times would cause governments to take actions that would lead to a collapse of the open global economy, a spike in general riots and disturbances, and eerie echoes of the Great Depression. Let's assume that the global economy persists in sputtering for a while, because that's what happens after major financial shocks. Why won't these other bad things happen? Why isn't it 1931? Let's start with the obvious -- it's not gonna be 1931 because there's some passing familiarity with how 1931 played out. The Chairman of the Federal Reserve has devoted much of his academic career to studying the Great Depression. I'm gonna go out on a limb therefore and assert that if the world plunges into a another severe downturn, it's not gonna be because central bank heads replay the same set of mistakes. The legacy of the Great Depression has also affected public attitudes and institutions that provide much stronger cement for the current system. In terms of [public] attitudes, compare the results of this mid-2007 poll with this mid-2010 poll about which economic system is best. I'll just reproduce the key charts below: The headline of the 2010 results is that there's eroding U.S. support for the global economy, but a few other things stand out. U.S. support has declined, but it's declined from a very high level. In contrast, support for free markets has increased in other major powers, such as Germany and China. On the whole, despite the worst global economic crisis since the Great Depression, public attitudes have not changed all that much. While there might be populist demands to "do something," that something is not a return to autarky or anything so [drastic]. Another big difference is that multilateral economic institutions are much more robust now than they were in 1931. On trade matters, even if the Doha round is dead, the rest of the World Trade Organization's corpus of trade-liberalizing measures are still working quite well. Even beyond the WTO, the complaint about trade is not the deficit of free-trade agreements but the surfeit of them. The IMF's resources have been strengthened as a result of the 2008 financial crisis. The Basle Committee on Banking Supervision has already promulgated a plan to strengthen capital requirements for banks. True, it's a slow, weak-assed plan, but it would be an improvement over the status quo. As for the G-20, I've been pretty skeptical about that group's abilities to collectively address serious macroeconomic problems. That is setting the bar rather high, however. One could argue that the G-20's most useful function is reassurance. Even if there are disagreements, communication can prevent them from growing into anything worse. Finally, a note about the possibility of riots and other general social unrest. The working paper cited in my previous post noted the links between austerity measures and increases in disturbances. However, that paper contains the following important paragraph on page 19: [I]n countries with better institutions, the responsiveness of unrest to budget cuts is generally lower. Where constraints on the executive are minimal, the coefficient on expenditure changes is strongly negative -- more spending buys a lot of social peace. In countries with Polity-2 scores above zero, the coefficient is about half in size, and less significant. As we limit the sample to ever more democratic countries, the size of the coefficient declines. For full democracies with a complete range of civil rights, the coefficient is still negative, but no longer significant. This is good news!! The world has a hell of a lot more democratic governments now than it did in 1931. What happened in London, in other words, might prove to be the exception more than the rule. So yes, the recent economic news might seem grim. Unless political institutions and public attitudes buckle, however, we're unlikely to repeat the mistakes of the 1930's. And, based on the data we've got, that's not going to happen.

### Conventional SMRs CP

#### LFTRs solve better than all alternatives—avoid the turns

Thompson ‘11 Kalee Thompson [freelance writer who covers science, the environment, and the outdoors] “Concepts & Prototypes: Two Next-Gen Nukes” Posted 06.27.2011 at 9:56 am82 Comments <http://www.popsci.com/technology/article/2011-06/next-gen-nuke-designs-promise-safe-efficient-emissions-free-energy>

Like many of the 20 or so pending Generation III+ facilities in the U.S., the Vogtle plant will house Westinghouse AP1000 reactors. A light-water reactor, the AP1000 prompts uranium-235 into a chain reaction that throws off high-energy neutrons. The particles heat water into steam, which then turns a turbine that generates electricity.¶ The greatest danger in a nuclear plant is a meltdown, in which solid reactor fuel overheats, melts, and ruptures its containment shell, releasing radioactive material. (Want more information? Check out our explainer on how nuclear reactors work--and how they fail.) Like most reactors, the AP1000 is cooled with electrically powered water pumps and fans, but it also has a passive safety system, which employs natural forces such as gravity, condensation and evaporation to cool a reactor during a power outage.¶ The U.S. has 104 nuclear reactors operating at 65 sites in 31 states, all of them approved before 1980.A central feature of this system is an 800,000-gallon water tank positioned directly above the containment shell. The reservoir’s valves rely on electrical power to remain closed. When power is lost, the valves open and the water flows down toward the containment shell. Vents passively draw air from outside and direct it over the structure, furthering the evaporative cooling.¶ Depending on the type of emergency, an additional reservoir within the containment shell can be manually released to flood the reactor. As water boils off, it rises and condenses at the top of the containment shell and streams back down to cool the reactor once more. Unlike today’s plants, most of which have enough backup power onsite to last just four to eight hours after grid power is lost, the AP1000 can safely operate for at least three days without power or human intervention.¶ Even with their significant safety improvements, Generation III+ plants can, theoretically, melt down. Some people within the nuclear industry are calling for the implementation of still newer reactor designs, collectively called Generation IV. The thorium-powered molten-salt reactor (MSR) is one such design. In an MSR, liquid thorium would replace the solid uranium fuel used in today’s plants, a change that would make meltdowns all but impossible¶ MSRs were developed at Tennessee’s Oak Ridge National Laboratory in the early 1960s and ran for a total of 22,000 hours between 1965 and 1969. “These weren’t theoretical reactors or thought experiments,” says engineer John Kutsch, who heads the nonprofit Thorium Energy Alliance. “[Engineers] really built them, and they really ran.” Of the handful of Generation IV reactor designs circulating today, only the MSR has been proven outside computer models. “It was not a full system, but it showed you could successfully design and operate a molten-salt reactor,” says Oak Ridge physicist Jess Gehin, a senior program manager in the lab’s Nuclear Technology Programs office.¶ One pound of thorium produces as much power as 300 pounds of uranium--or 3.5 million pounds of coal.The MSR design has two primary safety advantages. Its liquid fuel remains at much lower pressures than the solid fuel in light-water plants. This greatly decreases the likelihood of an accident, such as the hydrogen explosions that occurred at Fukushima. Further, in the event of a power outage, a frozen salt plug within the reactor melts and the liquid fuel passively drains into tanks where it solidifes, stopping the fission reaction. “The molten-salt reactor is walk-away safe,” Kutsch says. “If you just abandoned it, it had no power, and the end of the world came--a comet hit Earth--it would cool down and solidify by itself.”¶ Although an MSR could also run on uranium or plutonium, using the less-radioactive element thorium, with a little plutonium or uranium as a catalyst, has both economic and safety advantages. Thorium is four times as abundant as uranium and is easier to mine, in part because of its lower radioactivity. The domestic supply could serve the U.S.’s electricity needs for centuries. Thorium is also exponentially more efficient than uranium. “In a traditional reactor, you’re burning up only a half a percent to maybe 3 percent of the uranium,” Kutsch says. “In a molten-salt reactor, you’re burning 99 percent of the thorium.” The result: One pound of thorium yields as much power as 300 pounds of uranium--or 3.5 million pounds of coal.¶ Because of this efficiency, a thorium MSR would produce far less waste than today’s plants. Uranium-based waste will remain hazardous for tens of thousands of years. With thorium, it’s more like a few hundred. As well, raw thorium is not fissile in and of itself, so it is not easily weaponized. “It can’t be used as a bomb,” Kutsch says. “You could have 1,000 pounds in your basement, and nothing would happen.”

#### Uranium-fueled SMRs are a huge prolif risk

Makhijani and Boyd 2010 – ARJUN MAKHIJANI [Arjun Makhijani is an electrical and nuclear engineer who is President of the Institute for Energy and Environmental Research] and MICHELE BOYD [Michele Boyd is the former director of the Safe Energy Program at Physicians for Social Responsibility] “Small Modular Reactors No Solution for the Cost, Safety, and Waste Problems of Nuclear Power” Fact sheet completed in September 2010 <http://www.psr.org/nuclear-bailout/resources/small-modular-reactors-no.pdf>

In addition, the use of plutonium fuel or uranium enriched to levels as high as 20 percent—four to five times the typical enrichment level for present commercial light water reactors—presents serious proliferation risks, especially as some SMRs are proposed to be exported to developing countries with small grids and/or installed in remote locations. Security and safety will be more difficult to maintain in countries with no or underdeveloped nuclear regulatory infrastructure and in isolated areas. Burying the reactor underground, as proposed for some designs, would not sufficiently address security because some access from above will still be needed and it could increase the environmental impact to groundwater, for example, in the event of an accident.

### Introna K

#### Calculation is inevitable, but we can still calculate for the other. Their attempts to be free of calculation ensures that their ethic is co-opted

Derrida ‘2 Jacques Derrida, Directeur d’Etudes at the Ecole des Hautes Etudes en Sciences Sociales in Paris, and Professor of Philosophy, French and Comparative Literature at the University of California, Irvine, 2002, Acts of Religion, p. 255-57

This excess of justice over law and calculation, this overflowing of the unpre­sentable over the determinable, cannot and should not [ne peut pas et ne doit pas] serve as an alibi for staying out of juridico-political battles, within an institution or a state, between institutions or states. Abandoned to itself, the incalculable and giv­ing [donatrice] idea of justice is always very close to the bad, even to the worst for it can always be reappropriated by the most perverse calculation. It is always possible, and this is part of the madness of which we were speaking. An absolute assurance against this risk can only saturate or suture the opening of the call to justice, a call that is always wounded. But incalculable justice commands calculation. And first of all, closest to what one associates with justice, namely, law, the juridical field that one cannot isolate within sure frontiers, but also in all the fields from which one cannot separate it, which intervene in it and are no longer simply fields: the ethical, the political, the economical, the psycho-sociological, the philosophical, the liter­ary, etc. Not only must one [il faut] calculate, negotiate the relation between the calculable and the incalculable, and negotiate without a rule that would not have to be reinvented there where we are “thrown’ there where we find ourselves; but one must [il faut] do so and take it as far as possible, beyond the place we find our­selves and beyond the already identifiable zones of morality, politics, or law, beyond the distinctions between national and international, public and private, and so on. The order of this il faut does not properly belong either to justice or to law. It only belongs to either realm by exceeding each one in the direction of the other—which means that, in their very heterogeneity, these two orders are undis­sociable: de facto and de jure [en fait et en droit]. Politicization, for example, is interminable even if it cannot and should not ever be total. To keep this from being a truism, or a triviality, one must recognize in it the following consequence: each advance in politicization obliges one to reconsider, and so to reinterpret the very foundations of law such as they had previously been calculated or delimited. This was true for example in the French Declaration of the Rights of Man, in the abolition of slavery, in all the emancipatory battles that remain and will have to remain in progress, everywhere in the world, for men and for women. Nothing seems to me less outdated than the classical emancipatory ideal. One cannot attempt to disqualify it today, whether crudely or with sophistication, without at least some thoughtlessness and without forming the worst complicities. It is true that it is also necessary to re-elaborate, without renouncing, the concept of eman­cipation, enfranchisement, or liberation while taking into account the strange structures we have been describing. But beyond these identified territories of juridico-politicization on the grand geo-political scale, beyond all self-serving misappropriations and hijackings, beyond all determined and particular reappropria­tions of international law, other areas must constantly open up that can at first resemble secondary or marginal areas. This marginality also signifies that a vio­lence, even a terrorism and other forms of hostage taking are at work. The exam­ples closest to us would be found in the area of laws [lois] on the teaching and practice of languages, the legitimization of canons, the military use of scientific research, abortion, euthanasia, problems of organ transplant, extra-uterine con­ception, bio-engineering, medical experimentation, the “social treatment” of AIDS, the macro- or micro-politics of drugs, homelessness, and so on, without forgetting; of course, the treatment of what one calls animal life, the immense question of so-called animality. On this last problem, the Benjamin text that I am coming to now shows that its author was not deaf or insensitive to it, even if his propositions on this subject remain quite obscure or traditional.

#### The K destroys eco-pragmatism—turns the link

Lewis ’92 Martin Lewis professor in the School of the Environment and the Center for International Studies at Duke University. Green Delusions, 1992 p17-18

Nature for Nature’s Sake—And Humanity for Humanity’s It is widely accepted that environmental thinkers can be divided into two camps: those who favor the preservation of nature for nature’s sake, and those who wish only to maintain the environment as the necessary habitat of humankind (see Pepper 1989; O’Riordan 1989; W Fox 1990). In the first group stand the green radicals, while the second supposedly consists of environmental reformers, also labeled “shallow ecologists.” Radicals often pull no punches in assailing the members of the latter camp for their anthropocentrism, managerialism, and gutless accommo¬dationism—to some, “shallow ecology” is “just a more efficient form of exploitation and oppression” (quoted in Nash 1989:202). While this dichotomy may accurately depict some of the major approaches of the past, it is remarkably unhelpful for devising the kind of framework required for a truly effective environmental movement. It incorrectly assumes that those who adopt an anti-anthropocentric view (that is, one that accords intrinsic worth to nonhuman beings) will also embrace the larger political programs of radical environmentalism. Similarly, it portrays those who favor reforms within the political and economic structures of representative democracies as thereby excluding all nonhumans from the realm of moral consideration. Yet no convincing reasons are ever provided to show why these beliefs should necessarily be aligned in such a manner. (For an instructive discussion of the pitfalls of the anthropocentric versus nonanthropocentric dichotomy, see Nor¬ton 1987, chapter ir.)

#### Being has not been forgotten—but totalizing accounts of technology shut themselves off from any relation to it

Latour ’93 Bruno Latour, professor at the Ecole des Mines de Paris, We Have Never Been Modern, Harvard University Press: Cambridge, 1993, p. 66-67

Who has forgotten Being? No one, no one ever has, otherwise Nature would be truly available as a pure 'stock'. Look around you: scientific objects are circulating simultaneously as subjects, objects and discourse. Networks are full of Being. As for machines, they are laden with subjects and collectives. How could a being lose its difference, its incompleteness, its mark, its trace of Being? This is never in anyone's power; otherwise we should have to imagine that we have truly been modern, we should be taken in by the upper half of the modern Constitution. Has someone, however, actually forgotten Being? Yes: anyone who really thinks that Being has really been forgotten. As Levi-Strauss says, 'the barbarian is first and foremost the man who believe in barbarism.' (Levi-Strauss, [1952] 1987. p. 12). Those who have failed to undertake empirical studies of sciences, technologies, law, politics, economics, religion or fiction have lost the traces of Being that are distributed everywhere among beings. If, scorning empiricism, you opt out of the exact sciences, then the human sciences, then traditional philosophy, then the sciences of language, and you hunker down in your forest -- then you will indeed feel a tragic loss. But what is missing is you yourself, not the world! Heidegger's epigones have converted that glaring weakness into a strength. 'We don't know anything empirical, but that doesn't matter, since your world is empty of Being. We are keeping the little flame of Being safe from everything, and you, who have all the rest, have nothing.' On the contrary: we have everything, since we have Being, and beings, and we have never lost track of the difference between Being and beings. We are carrying out the impossible project undertaken by Heidegger, who believed what the modern Constitution said about itself without understanding that what is at issue there is only half of a larger mechanism which has never abandoned the old anthropological matrix. No one can forget Being, since there has never been a modern world, or, by the same token, metaphysics. We have always remained pre-Socratic, pre-Cartesian, pre-Kantian, pre-Nietzschean. No radical revolution can separate us from these pasts, so there is no need for reactionary counter-revolutions to lead us back to what has never been abandoned. Yes, Heraclitus is a surer guide than Heidegger: 'Einai gar kai entautha theous.'

### Uranium Prices DA

#### No risk of major power draw-in

Foreign Affairs, March/April 1998

Conflict in the region is aggravated by Russia's unsuccessful military venture in Chechnya, although Russian troops were subsequently withdrawn. The wars in Nagorno-Karabakh, South Ossetia, Abkhazia, and Chechnya may not be the final chapters in the escalation of conflicts in the Caucasus. The many reasons for division among the Caucasian peoples are precisely why the region needs an external arbiter. The European countries and the United States will not intervene militarily in any Caucasian conflict, as the potential for casualties is high in mountain warfare against local militia and troops could not ensure control of territory.

#### Zero chance of US draw-in

National Interest, Winter 1999/2000

As to the first of these, a feeling exists both among some would-be Republican foreign policy leaders and among the more russophobe present policymakers that a much more ambitious U.S. policy in the Caspian region has been thwarted by the malign influence of "russophiles" led by Strobe Talbott. In small part, perhaps; but the real reason is that if you go to a senior Pentagon official, or the great majority of [congresspeople] congressmen, and suggest the deployment of U.S. troops to the Caspian region--to bases or as peacekeepers, let alone in conflict--they look at you as if you had sprouted a very large pair of hairy ears. Even if for a while U.S. rhetoric over a "forward policy" in the Caspian region intensifies under a future administration, this severe restriction will continue to apply, for it reflects two fundamental realities: that as soon as you compare the Caspian to Europe, East Asia, Central America or the Middle East, its "vital importance" is immediately revealed as nonsense; and that the great majority of U.S. educated opinion, let alone of the general public, is overwhelmingly indifferent to developments there. A small but telling example of this appeared at the time of the attempted assassination of President Karimov of Uzbekistan in February 1999, allegedly by Islamist extremists. His death would have caused a political earthquake in the region--but the attempt was barely noticed by the U.S. media.

### SoKo 123 DA

#### No link—Obama won’t push for no-ENR pledges

Lugar 12 (Richard G. Lugar, former member of the Senate Foreign Relations Committee and coauthor of the Nunn-Lugar Cooperative Threat Reduction program, 2/21/12, Obama's Nuclear Misstep, nationalinterest.org/commentary/obamas-nuclear-mistake-6548)

However, the United States and the United Arab Emirates took an important joint step forward when they concluded a nuclear pact that, for the first time, contained a commitment from the receiving country that it would neither enrich nor reprocess on its territory. This 123 agreement became known as "the Gold Standard." My hope was that this agreement, done entirely outside of the requirements of existing law and in a bipartisan manner across the Bush and Obama administrations, would form a new basis for U.S. nuclear trade and internationalize the sound decision made by the UAE and the United States. Such a model could become a bulwark against further countries engaging in enrichment and reprocessing. Thus, it also could have meant fewer places for potential proliferators to gain access to such technology and materials. Instead of making it a requirement for all new agreements, however, the administration announced in a recent letter to me that it has opted for a "case-by-case" approach with regard to the Gold Standard in new 123 agreements. I fear this means there will be few cases in which we shall see its return.

#### 123 agreements are prolif-resistant enough—no ENR pledge not key

McGoldrick 10 (Fred, CSIS, spent 30 years at the U.S. State and Energy Departments and at the U.S. mission to the IAEA, negotiated peaceful nuclear cooperation agreements with a number of countries and helped shape the policy of the United States to prevent the spread of nuclear weapons, 11/30/10, The U.S.-UAE Peaceful Nuclear Cooperation Agreement: A Gold Standard or Fool’s Gold?, http://csis.org/files/publication/101130\_McGoldrick\_USUAENuclear.pdf)

Finally, while we have many ways to promote nonproliferation objectives, one important nonproliferation tool that we cannot afford to lose is our ability to enter into peaceful nuclear cooperation agreements with other countries. This capability, among others, has allowed the United States to promote widespread acceptance of nonproliferation norms and restraints, including international safeguards and physical protection measures and the NPT. U.S. agreements for cooperation in peaceful nuclear energy with other states require strict nonproliferation controls that go beyond those of other suppliers, such as consent rights on reprocessing, enrichment, and storage of weapons-usable materials subject to our agreements. They also provide a framework for establishing invaluable person-to-person and institution-to-institution contacts and collaboration that can help advance our nonproliferation objectives.

#### Their ev is what nonprolif advocates want Obama to do—not what he WILL do

Grossman 12 (Elaine, Global Security Newswire, 1/12/12, U.S. Nuclear Trade Talks with Vietnam, Jordan Moving Forward, www.nti.org/gsn/article/us-nuclear-trade-talks-vietnam-jordan-moving-forward/)

Nonproliferation proponents have argued that the United States should advocate in nuclear trade negotiations with nations such as Vietnam, Jordan and potentially Saudi Arabia that any agreement contain a pledge not to enrich uranium or reprocess plutonium on their territory. These activities are useful for civil energy programs but could also open the door to the clandestine development of nuclear weapons, if a nation opts to move in that direction. The United Arab Emirates volunteered in its 2009 atomic trade pact with Washington to renounce a right to enrich or reprocess, but the Obama administration has been reluctant to necessarily demand this type of “no-ENR” pledge from every other cooperative-agreement partner with whom it negotiates. Senior officials have warned that this so-called “gold standard” approach could undercut the U.S. nuclear industry’s ability to compete in the international marketplace and could ultimately leave Washington with less influence over nonproliferation concerns. It remained unclear this week how hard Kang and his negotiating team would press Vietnam to agree to a UAE-like gold standard. The administration letter to Congress, which has not been made public, discusses the ENR matter at some length, according to those privy to the text. The Obama team intends to pursue its approach to enrichment and reprocessing in future nuclear trade pacts on the basis of a “case-by-case” review, the letter reportedly states. In talks with Vietnam, U.S. negotiators would explore a range of ENR options, said one congressional aide familiar with the missive. This staffer and others on Capitol Hill were interviewed for this article on condition of not being named, saying they lacked the authority to discuss the matter openly. There are a variety of ways to pursue nonproliferation goals while engaging in nuclear commerce, the letter reportedly states, such as following trade guidelines set out by the Nuclear Suppliers Group, as well as using international fuel reserves, fuel services or fuel banks to obviate any need for domestic enrichment or reprocessing. It remains uncertain which of these various tools, if any, might be used in a potential Vietnam deal. “We’ve actually had tabled, I think, for almost a year our basic, boilerplate ‘123’ … agreement to Vietnam,” Tauscher said on Thursday, referring to nuclear trade pacts governed by Section 123 of the U.S. Atomic Energy Act. “And now we’re going to go forward and do that.” Some issue experts have speculated that Vietnam might not seek to enrich or reprocess as its nuclear energy sector develops. Hanoi would be unlikely to volunteer such a restriction in its pact with Washington, though, said one congressional source. Whether U.S. negotiators would push -- or even ask -- Vietnam for such a pledge was not spelled out in the letter, according to those familiar with the document. It could be that the Obama administration would prefer not to see a no-ENR commitment in the Vietnam agreement because that could heighten pressure on Washington to seek similar pledges in negotiations elsewhere, even in nations where U.S. officials are not keen on arm-twisting, said one congressional aide.

#### Alliance resilient – we station 30,000 trips in Korea

Ireland ‘9 Corydon Ireland, Harvard News Office, “Firm allies, past and present,” Harvard Gazette, 09/14/09, http://news.harvard.edu/gazette/story/2009/09/firm-allies-past-and-present/

She visited the John F. Kennedy Jr. Forum last week (Sept. 11) and, in a rare double ambassadorial appearance, took the stage with her South Korean counterpart, Han Duck-soo. Earlier this year, Han — a former prime minister of South Korea and one of the architects of its economic boom — assumed the duties of ambassador to the United States. In a conversation in front of a capacity crowd at the forum, the two diplomats reflected on the historical strength of the alliance and what issues might put it at risk. Both agreed it would take a lot to shake a political relationship that dates back to the 19th century, and one that was forged in steel by the Korean War. It is an alliance “less brittle and far more resilient than it ever has been,” said Stephens. Han, who in 1984 earned a Harvard Ph.D. in economics, called the U.S.-South Korea alliance the foundation of his nation’s “economic growth, prosperity, and security.” It remains so firm and mutual today, he added, that it could be an international model of cooperation — “the exemplar alliance relationship of the future.” Moderating the public conversation between ambassadors was Graham Allison, a terrorism scholar who has studied the threat posed by a nuclear-armed North Korea. He is Douglas Dillon Professor of Government at Harvard Kennedy School (HKS) and director of the Belfer Center for Science and International Affairs. Skeptical and probing, Allison prompted the two diplomats to imagine a near future in which the traditional alliance enjoyed by the United States and South Korea goes sour. In sum, he asked, what could go wrong and what issues need attending to? Neither of the ambassadors budged much. In fact, said Han, “there is a very, very fundamental notion that U.S.-Korea relations cannot be swayed by one or two events.” It is and has been an alliance, he said, that has never been “underestimated or disregarded. It was always central.”

## 1AR

### Uranium Prices DA

#### No risk of draw in—the Cold War is over, dumbass

Africa News, 8/6/04

To begin with, what are the new global threats? The termination of the Cold War removed the risk of a cataclysmic clash between two global alliances, the North Atlantic Treaty Organisation (NATO), and the Warsaw Part. Yes, the world is no longer frozen into the nuclear confrontation of the cold war, which dragged smaller nations into the superpowers' conflicts often under nasty client governments. But the passing of that danger of huge, nuclear war has opened up in Africa and Asia and parts of Europe many little wars with almost equally enormous consequences. The removal of totalitarian power in the ex-communist lands gave long-suppressed ethnic hatreds their chance to explode. In non-communist dictatorships, the cold war's victory of democracy over dictatorship made many people, who are still denied the right to run their lives, ask why they, too, should not be free.

### Prolif

#### Their study is biased

Rees ’11 Eifion Rees, “Don't believe the spin on thorium being a ‘greener’ nuclear option,” The Ecologist, 6/23/2011, http://www.theecologist.org/News/news\_analysis/952238/dont\_believe\_the\_spin\_on\_thorium\_being\_a\_greener\_nuclear\_option.html

Proponents counter that the NNL paper fails to address the question of MSR technology, evidence of its bias towards an industry wedded to PWRs. Reliant on diverse uranium/plutonium revenue streams – fuel packages and fuel reprocessing, for example – the nuclear energy giants will never give thorium a fair hearing, they say.

#### No fabrication necessary in LFTRs

Sorensen ’11 Kirk F. Sorensen, served as Chief Nuclear Technologist at Teledyne Brown Engineering, worked for ten years at NASA’s Marshall Space Flight Center spending the last two of those years on assignment to the US Army Space and Missile Defense Command, Masters of Science in Aerospace Engineering from the Georgia Institute of Technology, “IEER/PSR Thorium “Fact Sheet” Rebuttal,” response to the 2009 Makhijani and Boyd piece on thorium, posted 3/23/2011 by Kirk Sorenson on Energy From Thorium, http://energyfromthorium.com/ieer-rebuttal/

Previously I mentioned the implications of the presence of uranium-232 contamination within uranium-233 and its anti-proliferative nature with regards to nuclear weapons. U-232 contamination also makes fabrication of solid thorium-oxide fuel containing uranium-233-oxide very difficult. In the liquid-fluoride reactor, fuel fabrication is unnecessary and this difficulty is completely averted.

#### No spent fuel—it’s a closed fuel cycle

Cannara ’10 Alexander Cannara, received his BSEE degree from Lehigh University, and received MSEE, DEE and MS Statistics degrees from Stanford, returned to Stanford for a PhD in Mathematical Methods in Educational Research and a Master of Science in Statistics, during which time he designed analog and digital instrumentation, applying for a patent on one design, has taught courses in engineering, programming and networking at Stanford, University of San Francisco, International Technological University, Golden Gate and Silicon Valley University, and has worked both for the government and in the corporate arena with such organizations as Ballantine Laboratories, RMC Research, Zilog, Gibbons & Associates, Mitsubishi Semiconductor, AMD, 3Com, Network General, Vitesse, PacketMotion and Xambala, “Cannara’s Rebuke of PSR/IEER,” letter written to the Physicians for Social Responsibility and Nuclear Information and Resource Service calling them out for publishing the Makhijani & Boyd piece, posted 5/13/2010 by Kirk Sorenson on Energy From Thorium, http://energyfromthorium.com/2010/05/13/cannaras-rebuke-of-psrieer/

j) The 8th paragraph is singularly misleading, because there’s no “spent fuel” in an MSR – all Th232 & U233 are consumed, and there’s never a scheduled shutdown for refueling, because of the very nature of the design – an unpressurized,liquid. ThF4 or UF4 (or even higher U & Pu isotopes as salts) are simply added into the molten mix as it’s pumped around the reactor & heat-exchanger plumbing. It’s what every chemist understands & loves: liquid, unpressurized chemistry. And, since all fuel is consumed, an MSR can be used to reduce nuclear wastes down to any level desired, even on the site of a de-commissioned U/Pu reactor. This is exactly the kind of ability responsible scientists, engineers, doctors, politicians and citizens care about. PSR/IEER proliferation of this paper hides what is perhaps the most important knowledge we need today to pursue a weapons-free world — MSRs can consume them all. Why the authors say nothing of this deserves intense scrutiny. For details… [www.thoriumenergyalliance.com/downloads/TEAC2\_LarsJorgensen.pdf](http://www.thoriumenergyalliance.com/downloads/TEAC2_LarsJorgensen.pdf) k) The 11th & 12th paragraphs continue on the irrelevant tack of “reprocessing” and loose, solid U232/233. The MSR has none of this outside an 800degC molten salt.

# Rd 4 vs Liberty CM

## 1AC

#### See rd 2

## 2AC

### Solvency

#### Plan is comparatively a drop in the bucket – other renewables spending now

Sustainable Business 11 (October 17, "US Military to Invest %2410 Billion a Year in Renewable Energy" http://www.sustainablebusiness.com/index.cfm/go/news.display/id/23039-http://www.sustainablebusiness.com/index.cfm/go/news.display/id/23039)

Military spending on renewable energy spiked over 300% between 2006-2009, to $1.2 billion, and is expected to exceed $10 billion a year by 2030, according to "From Barracks to the Battlefield: Clean Energy Innovation and America's Armed Forces," by the Pew Project on National Security, Energy and Climate. DOD currently spends about $20 billion a year on energy - 75% for fuel and 25% for facilities and infrastructure, according to Pike Research. DOD is focusing on vehicle efficiency, advanced biofuels, and energy efficiency and renewable energy at bases. It's expected to spend $2.25 billion a year by 2015 for efficient vehicles used in the air, land, and sea, while improving the energy efficiency of its buildings around the world - more than 500,000 of them.

#### Military clean energy spending now – should trigger cuts

TDC 2012 (April 2, "Military sees threats, worry in climate change" http://wwwp.dailyclimate.org/tdc-newsroom/2012/04/climate-security-http://wwwp.dailyclimate.org/tdc-newsroom/2012/04/climate-security)

Detractors of the military's clean-energy efforts have taken another view, focusing on the immediate, higher costs and uncertainties of developing and testing technologies, like running jets on biofuels, while the Pentagon faces cuts to weapons programs and other areas. After President Obama doubled Defense Department energy efficiency spending to $1 billion in his 2012 spending plan, Republican lawmakers hauled Navy Secretary Ray Mabus before Congress in February to justify his department's programs. Mabus told Congress that biofuel prices could be competitive with oil by 2020 – and that cost parity could be helped along as the military's different branches test alternative fuels and work with researchers and scientists. After all, GPS, Internet, microchips and nuclear power all got a boost from the Navy's nuclear submarine program, McGinn noted. "The military had mission needs and they made investments." "They paid more than the private sector would ever consider," he added. "But the results were benefits for larger society."

#### Civilian workers get cut, not weapons systems – and the possibility of sequestration triggers your link

Weisgerber 10/8 (Marcus, staff writer at Defense News, "If Cuts Happen, Troops, Major Weapons Are DoD Priorities," 2012, [www.defensenews.com/article/20121008/DEFREG02/310080001/If-Cuts-Happen-Troops-Major-Weapons-DoD-Priorities?odyssey=nav%7Chead], jam)

The Pentagon will move to protect major weapon programs, including those locked into fixed-price procurement deals, should mandatory U.S. government spending cuts go into effect under sequestration in January. The Defense Department would also consider furloughing civilian workers as a last-ditch way to pay for combat operations in Afghanistan, should the Pentagon have to absorb a $50 billion sequestration cut to its 2013 budget, Pentagon Comptroller Robert Hale said. “What we will do if we have to ... is ask the services to review key contracts and try to avoid any renegotiations that are disruptive,” Hale said during an Oct. 3 interview at the Pentagon. DoD might have a “limited ability” to reprogram funds across accounts, Hale noted, but Congress must approve funds shifted that way. “I think for high-priority contracts, we might try to do that,” he said. DoD leaders have consistently maintained that they are not making detailed plans for possible sequestration. Hale’s remarks, however, shed some light on how the Pentagon might proceed if further cuts are necessary. Gordon Adams, an analyst who oversaw defense budgets during the Clinton administration, said the Pentagon would likely send a $15 billion to $20 billion reprogramming request to Congress, should sequestration go into effect. But DoD could be playing with fire if it relies on lawmakers to shift funding, said Todd Harrison, an analyst with the Center for Strategic and Budgetary Assessments. “There’s just a big asterisk there that they are crossing their fingers and hoping that Congress will go along with a reprogramming,” he said. “What if they don’t?” The White House Office of Management and Budget (OMB) has yet to instruct DoD and other federal departments on how to implement the sequestration cuts, which are expected to be divvied evenly across budget coffers, with the exception of military personnel, whom the administration exempted. The possibility of sequestration and uncertainty on how it will play out has left many program managers and defense industry leaders grappling with what to expect and how to respond. Last month, Maj. Gen. John Thompson, who runs the Air Force’s $35 billion KC-46 tanker program, said he was afraid sequestration might force him to cancel the service’s fixed-price aircraft development contract with Boeing and renegotiate at a higher cost. “I don’t want to break my contract, and I’m fearful sequestration may force me to do that,” he said during a Sept. 18 briefing at an Air Force Association-sponsored conference. Hale said it is too early to signal specific programs that might fall into this category. “I understand the worry,” he said. “It’s premature to conclude that we would have to modify a specific contract like KC-46 or even have to renegotiate future parts of it.” If sequestration happens, DoD will implement it “in a way that minimizes the disruption and the devastation,” Hale said. Contractors have been struggling whether to issue layoff notices in advance of the sequestration possibly going into effect. Job layoffs on the eve of a presidential election are a highly sensitive political issue, and on Sept. 28 the Obama administration advised contractors they were unnecessary, prompting Lockheed Martin and BAE Systems to cancel plans for sending out layoff notices.

#### If funding did come from the DoD, it would be from energy efficiency savings

Fitzpatrick et al 11 (Ryan, Senior Policy Advisor for Clean Energy at Third Way, Josh Freed, Vice President for Clean Energy at Third Way, Mieke Eoyang, Director for National Security at Third Way, "Fighting for Innovation: How DoD Can Advance Clean Energy Technology... And Why It Has To," Jun, [content.thirdway.org/publications/414/Third\_Way\_Idea\_Brief\_-\_Fighting\_for\_Innovation.pdf], jam)

Leverage Savings From Efficiency and Alternative Financing to Pay for Innovation. In an age of government-wide austerity and tight Pentagon budgets, current congressional appropriations are simply not sufficient to fund clean energy innovation. Until Congress decides to direct additional resources for this purpose, the Defense Department must leverage the money and other tools it already has to help develop clean energy. This can take two forms: repurposing money that was saved through energy efficiency programs for innovation and using alternative methods of financing to reduce the cost to the Pentagon of deploying clean energy. For several decades the military has made modest use alternative financing mechanisms to fund clean energy and efficiency projects when appropriated funds were insufficient. In a 2010 report, GAO found that while only 18% of renewable energy projects on DoD lands used alternative financing, these projects account for 86% of all renewable energy produced on the Department’s property.33 This indicates that alternative financing can be particularly helpful to DoD in terms of bringing larger and more expensive projects to fruition. One advanced financing tool available to DoD is the energy savings performance contract (ESPC). These agreements allow DoD to contract a private firm to make upgrades to a building or other facility that result in energy savings, reducing overall energy costs without appropriated funds. The firm finances the cost, maintenance and operation of these upgrades and recovers a profit over the life of the contract. While mobile applications consume 75% of the Department’s energy,34 DoD is only authorized to enter an ESPC for energy improvements done at stationary sites. As such, Congress should allow DoD to conduct pilot programs in which ESPCs are used to enhance mobile components like aircraft and vehicle engines. This could accelerate the needed replacement or updating of aging equipment and a significant reduction of energy with no upfront cost. To maximize the potential benefits of ESPCs, DoD should work with the Department of Energy to develop additional training and best practices to ensure that terms are carefully negotiated and provide benefits for the federal government throughout the term of the contract.35 This effort could possibly be achieved through the existing memorandum of understanding between these two departments.36 The Pentagon should also consider using any long-term savings realized by these contracts for other energy purposes, including the promotion of innovative technologies to further reduce demand or increase general energy security.

#### Not responsive – plan doesn’t increase military or economic power – only prevents an isolated scenario for conflict

#### Pursuit of hegemony’s locked-in

Zach Dorfman 12, assistant editor of Ethics and International Affairs, the journal of the Carnegie Council, and co-editor of the Montreal Review, “What We Talk About When We Talk About Isolationism”, May 18, http://dissentmagazine.org/online.php?id=605

The rise of China notwithstanding, the United States remains the world’s sole superpower. Its military (and, to a considerable extent, political) hegemony extends not just over North America or even the Western hemisphere, but also Europe, large swaths of Asia, and Africa. Its interests are global; nothing is outside its potential sphere of influence. There are an estimated 660 to 900 American military bases in roughly forty countries worldwide, although figures on the matter are notoriously difficult to ascertain, largely because of subterfuge on the part of the military. According to official data there are active-duty U.S. military personnel in 148 countries, or over 75 percent of the world’s states. The United States checks Russian power in Europe and Chinese power in South Korea and Japan and Iranian power in Iraq, Afghanistan, and Turkey. In order to maintain a frigid peace between Israel and Egypt, the American government hands the former $2.7 billion in military aid every year, and the latter $1.3 billion. It also gives Pakistan more than $400 million dollars in military aid annually (not including counterinsurgency operations, which would drive the total far higher), Jordan roughly $200 million, and Colombia over $55 million. U.S. long-term military commitments are also manifold. It is one of the five permanent members of the UN Security Council, the only institution legally permitted to sanction the use of force to combat “threats to international peace and security.” In 1949 the United States helped found NATO, the first peacetime military alliance extending beyond North and South America in U.S. history, which now has twenty-eight member states. The United States also has a trilateral defense treaty with Australia and New Zealand, and bilateral mutual defense treaties with Japan, Taiwan, the Philippines, and South Korea. It is this sort of reach that led Madeleine Albright to call the United States the sole “indispensible power” on the world stage. The idea that global military dominance and political hegemony is in the U.S. national interest—and the world’s interest—is generally taken for granted domestically. Opposition to it is limited to the libertarian Right and anti-imperialist Left, both groups on the margins of mainstream political discourse. Today, American supremacy is assumed rather than argued for: in an age of tremendous political division, it is a bipartisan first principle of foreign policy, a presupposition. In this area at least, one wishes for a little less agreement. In Promise and Peril: America at the Dawn of a Global Age, Christopher McKnight Nichols provides an erudite account of a period before such a consensus existed, when ideas about America’s role on the world stage were fundamentally contested. As this year’s presidential election approaches, each side will portray the difference between the candidates’ positions on foreign policy as immense. Revisiting Promise and Peril shows us just how narrow the American worldview has become, and how our public discourse has become narrower still. Nichols focuses on the years between 1890 and 1940, during America’s initial ascent as a global power. He gives special attention to the formative debates surrounding the Spanish-American War, U.S. entry into the First World War, and potential U.S. membership in the League of Nations—debates that were constitutive of larger battles over the nature of American society and its fragile political institutions and freedoms. During this period, foreign and domestic policy were often linked as part of a cohesive political vision for the country. Nichols illustrates this through intellectual profiles of some of the period’s most influential figures, including senators Henry Cabot Lodge and William Borah, socialist leader Eugene Debs, philosopher and psychologist William James, journalist Randolph Bourne, and the peace activist Emily Balch. Each of them interpreted isolationism and internationalism in distinct ways, sometimes deploying the concepts more for rhetorical purposes than as cornerstones of a particular worldview. Today, isolationism is often portrayed as intellectually bankrupt, a redoubt for idealists, nationalists, xenophobes, and fools. Yet the term now used as a political epithet has deep roots in American political culture. Isolationist principles can be traced back to George Washington’s farewell address, during which he urged his countrymen to steer clear of “foreign entanglements” while actively seeking nonbinding commercial ties. (Whether economic commitments do in fact entail political commitments is another matter.) Thomas Jefferson echoed this sentiment when he urged for “commerce with all nations, [and] alliance with none.” Even the Monroe Doctrine, in which the United States declared itself the regional hegemon and demanded noninterference from European states in the Western hemisphere, was often viewed as a means of isolating the United States from Europe and its messy alliance system. In Nichols’s telling, however, modern isolationism was born from the debates surrounding the Spanish-American War and the U.S. annexation of the Philippines. Here isolationism began to take on a much more explicitly anti-imperialist bent. Progressive isolationists such as William James found U.S. policy in the Philippines—which it had “liberated” from Spanish rule just to fight a bloody counterinsurgency against Philippine nationalists—anathema to American democratic traditions and ideas about national self-determination. As Promise and Peril shows, however, “cosmopolitan isolationists” like James never called for “cultural, economic, or complete political separation from the rest of the world.” Rather, they wanted the United States to engage with other nations peacefully and without pretensions of domination. They saw the United States as a potential force for good in the world, but they also placed great value on neutrality and non-entanglement, and wanted America to focus on creating a more just domestic order. James’s anti-imperialism was directly related to his fear of the effects of “bigness.” He argued forcefully against all concentrations of power, especially those between business, political, and military interests. He knew that such vested interests would grow larger and more difficult to control if America became an overseas empire. Others, such as “isolationist imperialist” Henry Cabot Lodge, the powerful senator from Massachusetts, argued that fighting the Spanish-American War and annexing the Philippines were isolationist actions to their core. First, banishing the Spanish from the Caribbean comported with the Monroe Doctrine; second, adding colonies such as the Philippines would lead to greater economic growth without exposing the United States to the vicissitudes of outside trade. Prior to the Spanish-American War, many feared that the American economy’s rapid growth would lead to a surplus of domestic goods and cause an economic disaster. New markets needed to be opened, and the best way to do so was to dominate a given market—that is, a country—politically. Lodge’s defense of this “large policy” was public and, by today’s standards, quite bald. Other proponents of this policy included Teddy Roosevelt (who also believed that war was good for the national character) and a significant portion of the business class. For Lodge and Roosevelt, “isolationism” meant what is commonly referred to today as “unilateralism”: the ability for the United States to do what it wants, when it wants. Other “isolationists” espoused principles that we would today call internationalist. Randolph Bourne, a precocious journalist working for the New Republic, passionately opposed American entry into the First World War, much to the detriment of his writing career. He argued that hypernationalism would cause lasting damage to the American social fabric. He was especially repulsed by wartime campaigns to Americanize immigrants. Bourne instead envisioned a “transnational America”: a place that, because of its distinct cultural and political traditions and ethnic diversity, could become an example to the rest of the world. Its respect for plurality at home could influence other countries by example, but also by allowing it to mediate international disputes without becoming a party to them. Bourne wanted an America fully engaged with the world, but not embroiled in military conflicts or alliances. This was also the case for William Borah, the progressive Republican senator from Idaho. Borah was an agrarian populist and something of a Jeffersonian: he believed axiomatically in local democracy and rejected many forms of federal encroachment. He was opposed to extensive immigration, but not “anti-immigrant.” Borah thought that America was strengthened by its complex ethnic makeup and that an imbalance tilted toward one group or another would have deleterious effects. But it is his famously isolationist foreign policy views for which Borah is best known. As Nichols writes: He was consistent in an anti-imperialist stance against U.S. domination abroad; yet he was ambivalent in cases involving what he saw as involving obvious national interest….He also without fail argued that any open-ended military alliances were to be avoided at all costs, while arguing that to minimize war abroad as well as conflict at home should always be a top priority for American politicians. Borah thus cautiously supported entry into the First World War on national interest grounds, but also led a group of senators known as “the irreconcilables” in their successful effort to prevent U.S. entry into the League of Nations. His paramount concern was the collective security agreement in the organization’s charter: he would not assent to a treaty that stipulated that the United States would be obligated to intervene in wars between distant powers where the country had no serious interest at stake. Borah possessed an alternative vision for a more just and pacific international order. Less than a decade after he helped scuttle American accession to the League, he helped pass the Kellogg-Briand Pact (1928) in a nearly unanimous Senate vote. More than sixty states eventually became party to the pact, which outlawed war between its signatories and required them to settle their disputes through peaceful means. Today, realists sneer at the idealism of Kellogg-Briand, but the Senate was aware of the pact’s limitations and carved out clear exceptions for cases of national defense. Some supporters believed that, if nothing else, the law would help strengthen an emerging international norm against war. (Given what followed, this seems like a sad exercise in wish-fulfillment.) Unlike the League of Nations charter, the treaty faced almost no opposition from the isolationist bloc in the Senate, since it did not require the United States to enter into a collective security agreement or abrogate its sovereignty. This was a kind of internationalism Borah and his irreconcilables could proudly support. The United States today looks very different from the country in which Borah, let alone William James, lived, both domestically (where political and civil freedoms have been extended to women, African Americans, and gays and lesbians) and internationally (with its leading role in many global institutions). But different strains of isolationism persist. Newt Gingrich has argued for a policy of total “energy independence” (in other words, domestic drilling) while fulminating against President Obama for “bowing” to the Saudi king. While recently driving through an agricultural region of rural Colorado, I saw a giant roadside billboard calling for American withdrawal from the UN. Yet in the last decade, the Republican Party, with the partial exception of its Ron Paul/libertarian faction, has veered into such a belligerent unilateralism that its graybeards—one of whom, Senator Richard Lugar of Indiana, just lost a primary to a far-right challenger partly because of his reasonableness on foreign affairs—were barely able to ensure Senate ratification of a key nuclear arms reduction treaty with Russia. Many of these same people desire a unilateral war with Iran. And it isn’t just Republicans. Drone attacks have intensified in Yemen, Pakistan, and elsewhere under the Obama administration. Massive troop deployments continue unabated. We spend over $600 billion dollars a year on our military budget; the next largest is China’s, at “only” around $100 billion. Administrations come and go, but the national security state appears here to stay.

#### DOE already announced specific SMR grants

Halper 12/3 (Mark, writer for the Weinberg Foundation, UK-based not-for-profit organisation dedicated to advancing the research, development and deployment of safe, clean and affordable nuclear energy technologies to combat climate change and underpin sustainable development for the world , "‘Small’ step forward for alternative nuclear: U.S. Dept. of Energy funds Babcock & Wilcox modular reactor" 2012, [www.the-weinberg-foundation.org/2012/12/03/small-step-forward-for-alternative-nuclear-u-s-dept-of-energy-funds-babcock-wilcox-modular-reactor/])

Neither DOE nor B&W would disclose the amount of funding DOE is providing. Various published reports including in the Charlotte Business Journal (Charlotte, North Carolina) and Oilprice.com pegged it at $225 million. “Through a five-year cost-share agreement, the Energy Department will invest up to half of the total project cost, with the project’s industry partners matching this investment by at least one-to-one,” DOE’s press release states. “The specific total will be negotiated between the Energy Department and Babcock & Wilcox.” The award was part of a project to fund $450 million of SMR development that DOE announced last March, so the $225 million would represent half of that programme. The New York Times had a more modest sense of the funding, noting, “At one point it (DOE) anticipated a $452 million program over five years, but so far Congress has appropriated only $67 million. The department is asking for another $65 million for the fiscal year that began on Oct. 1. Also, the department has not said how much it was providing to Babcock & Wilcox.” B&W CEO James Ferland welcomed the funding. “With this public-private partnership, the DOE is providing important national leadership for America in the global pursuit of SMR technology,” he said. “This partnership is essential to reestablishing our nation’s international competitiveness in the nuclear energy industry, as well as enhancing U.S. manufacturing infrastructure and energy independence. “ The company wasted no time in demonstrating momentum. About a week after winning the funding, it announced it had contracted Bethlehem, Pennsylvania-based Lehigh Heavy Forge Corp. to fabricate the shell.

#### There’s government-trained personnel for nuke

Robitaille 12 (George, Department of Army Civilian, United States Army War College, “Small Modular Reactors: The Army’s Secure Source of Energy?” 21-03-2012, Strategy Research Project)

Expansion of Reporting Requirements Regarding Department of Defense Energy Efficiency Programs,” requires the Secretary of Defense to evaluate the cost and feasibility of a policy that would require new power generation projects established on installations to be able to provide power for military operations in the event of a commercial grid outage.28 A potential solution to meet this national security requirement, as well as the critical needs of nearby towns, is for DoD to evaluate SMRs as a possible source for safe and secure electricity. Military facilities depend on reliable sources of energy to operate, train, and support national security missions. The power demand for most military facilities is not very high, and could easily be met by a SMR. Table 1 provides the itemized description of the annual energy requirements in megawatt of electricity (MWe) required for the three hundred seventy four DoD installations.29 DoD History with SMRs The concept of small reactors for electrical power generation is not new. In fact, the DoD built and operated small reactors for applications on land and at sea. The U.S. Army operated eight nuclear power plants from 1954 to 1977. Six out of the eight reactors built by the Army produced operationally useful power for an extended period, including the first nuclear reactor to be connected and provide electricity to the commercial grid. 30 The Army program that built and operated compact nuclear reactors was ended after 1966, not because of any safety issues, but strictly as a result of funding cuts in military long range research and development programs. In essence, it was determined that the program costs could only be justified if there was a unique DoD specific requirement. At the time there were none.31 Although it has been many years since these Army reactors were operational, the independent source of energy they provided at the time is exactly what is needed again to serve as a secure source of energy today. Many of the nuclear power plant designs used by the Army were based on United States Naval reactors. Although the Army stopped developing SMRs, the Navy as well as the private sector has continued to research, develop, and implement improved designs to improve the safety and efficiency of these alternative energy sources. The U.S. Navy nuclear program developed twenty seven different power plant systems and almost all of them have been based on a light water reactor design.32 This design focus can be attributed to the inherent safety and the ability of this design to handle the pitch and roll climate expected on a ship at sea. To date, the U. S Navy operated five hundred twenty six reactor cores in two hundred nineteen nuclear powered ships, accumulated the equivalent of over six thousand two hundred reactor years of operation and safely steamed one hundred forty nine million miles. The U.S. Navy has never experienced a reactor accident.33 All of the modern Navy reactors are design to use fuel that is enriched to ninety three percent Uranium 235 (U235) versus the approximate three percent U235 used in commercial light water reactors. The use of highly enriched U235 in Navy vessels has two primary benefits, long core lives and small reactor cores.34 The power generation capability for naval reactors ranges from two hundred MWe (megawatts of electricity) for submarines to five hundred MWe for an aircraft carrier. A Naval reactor can expect to operate for at least ten years before refueling and the core has a fifty year operational life for a carrier or thirty to forty years for a submarine.35 As an example, the world’s first nuclear carrier, the USS Enterprise, which is still operating, celebrated fifty years of operations in 2011.36 The Navy nuclear program has set a precedent for safely harnessing the energy associated with the nuclear fission reaction. In addition, the Navy collaborates with the private sector to build their reactors and then uses government trained personnel to serve as operators. Implementing the use of SMRs as a secure source of energy for our critical military facilities will leverage this knowledge and experience.

#### No fabrication necessary in LFTRs

Sorensen ’11 Kirk F. Sorensen, served as Chief Nuclear Technologist at Teledyne Brown Engineering, worked for ten years at NASA’s Marshall Space Flight Center spending the last two of those years on assignment to the US Army Space and Missile Defense Command, Masters of Science in Aerospace Engineering from the Georgia Institute of Technology, “IEER/PSR Thorium “Fact Sheet” Rebuttal,” response to the 2009 Makhijani and Boyd piece on thorium, posted 3/23/2011 by Kirk Sorenson on Energy From Thorium, http://energyfromthorium.com/ieer-rebuttal/

Previously I mentioned the implications of the presence of uranium-232 contamination within uranium-233 and its anti-proliferative nature with regards to nuclear weapons. U-232 contamination also makes fabrication of solid thorium-oxide fuel containing uranium-233-oxide very difficult. In the liquid-fluoride reactor, fuel fabrication is unnecessary and this difficulty is completely averted.

### Grid Adv

#### SMRs are key to grid invulnerability – renewables are a step back

Barton 11 (Charles, founder of the Nuclear Green Revolution blog, MA in philosophy, “Future storm damage to the grid may carry unacceptable costs”, April 30, http://nucleargreen.blogspot.com/2011\_04\_01\_archive.html)

Amory Lovins has long argued that the traditional grid is vulnerable to this sort of damage. Lovins proposed a paradigm shift from centralized to distributed generation and from fossil fuels and nuclear power to renewable based micro-generation. Critics have pointed to flaws in Lovins model. Renewable generation systems are unreliable and their output varies from locality to locality, as well as from day to day, and hour to hour. In order to bring greater stability and predictability to the grid, electrical engineers have proposed expanding the electrical transmission system with thousands of new miles of transmission cables to be added to bring electricity from high wind and high sunshine areas, to consumers. This would lead, if anything, to greater grid vulnerability to storm damage in a high renewable penetration situation. Thus Lovins renewables/distributed generation model breaks down in the face of renewables limitations. Renewables penetration, will increase the distance between electrical generation facilities and customer homes and businesses, increasing the grid vulnerable to large scale damage, rather than enhancing reliability. Unfortunately Lovins failed to note that the distributed generation model actually worked much better with small nuclear power plants than with renewable generated electricity. Small nuclear plants could be located much closer to customer's homes, decreasing the probability of storm damage to transmission lines. At the very worst, small NPPs would stop the slide toward increased grid expansion. Small reactors have been proposed as electrical sources for isolated communities that are too remote for grid hookups. If the cost of small reactors can be lowered sufficiently it might be possible for many and perhaps even most communities to unhook from the grid while maintaining a reliable electrical supply. It is likely that electrical power will play an even more central role in a post-carbon energy era. Increased electrical dependency requires increased electrical reliability, and grid vulnerabilities limit electrical reliability. Storm damage can disrupt electrical service for days and even weeks. In a future, electricity dependent economy, grid damage can actually impede storm recovery efforts, making large scale grid damage semi-self perpetuating. Such grid unreliability becomes a threat to public health and safety. Thus grid reliability will be a more pressing future issue, than it has been. It is clear that renewable energy sources will worsen grid reliability, Some renewable advocates have suggested that the so called "smart grid" will prevent grid outages. Yet the grid will never be smart enough to repair its own damaged power lines. In addition the "smart grid" will be venerable to hackers, and would be a handy target to statures. A smart grid would be an easy target for a Stuxnet type virus attack. Not only does the "smart grid" not solve the problem posed by grid vulnerability to storm damage, but efficiency, another energy approach thought to be a panacea for electrical supply problems would be equally useless. Thus, decentralized electrical generation through the use of small nuclear power plants offers real potential for increasing electrical reliability, but successful use of renewable electrical generation approaches may worsen rather than improved grid reliability.

#### Prolonged grid outage wrecks military command and control – escalates from both retaliation and deterrence collapse

Tilford 12 (Robert, Former soldier US Army, infantry, "Cyber attackers could shut down the electric grid for the entire east coast," Jul 27, [www.examiner.com/article/cyber-attackers-could-easily-shut-down-the-electric-grid-for-the-entire-east-coa])

The devastation that the Senator describes is truly unimaginable. To make matters worse a cyber attack that can take out a civilian power grid, for example could also cripple the U.S. military. The senator notes that is that the same power grids that supply cities and towns, stores and gas stations, cell towers and heart monitors also power “every military base in our country.” “Although bases would be prepared to weather a short power outage with backup diesel generators, within hours, not days, fuel supplies would run out”, he said. Which means military command and control centers could go dark. Radar systems that detect air threats to our country would shut Down completely. “Communication between commanders and their troops would also go silent. And many weapons systems would be left without either fuel or electric power”, said Senator Grassley. “So in a few short hours or days, the mightiest military in the world would be left scrambling to maintain base functions”, he said. We contacted the Pentagon and officials confirmed the threat of a cyber attack is something very real. Top national security officials—including the Chairman of the Joint Chiefs, the Director of the National Security Agency, the Secretary of Defense, and the CIA Director— have said, “preventing a cyber attack and improving the nation’s electric grids is among the most urgent priorities of our country” (source: Congressional Record). So how serious is the Pentagon taking all this? Enough to start, or end a war over it, for sure (see video: Pentagon declares war on cyber attacks http://www.youtube.com/watch?v=\_kVQrp\_D0kY&feature=relmfu ). A cyber attack today against the US could very well be seen as an “Act of War” and could be met with a “full scale” US military response. That could include the use of “nuclear weapons”, if authorized by the President.

#### New IAEA inspection methodologies make resource constraints irrelevant – they’ve moved away from a one-size fits all approach

Hibbs 12 (Mark, senior associate in Carnegie's Nuclear Policy Program, M.A. Columbia, "The Plan for IAEA Safeguards," Nov 20, [carnegieendowment.org/2012/11/20/plan-for-iaea-safeguards/ekyb#])

Until after the first Gulf War, virtually all IAEA safeguards were applied on the basis of routine accounting of nuclear materials associated with facilities that states declared to the IAEA. After postwar inspections revealed Iraq’s nuclear weapons program, and as the IAEA learned that other states—Egypt, Iran, Libya, North Korea, South Korea, and Syria—failed to declare to the IAEA all their nuclear activities, the IAEA began shifting its efforts away from tallying declared materials toward detecting undeclared activities. Because the IAEA’s accounting approach was not meant to detect such activities, it has sought to develop new methodologies, capabilities, and technologies, and in one case requested new legal authority from member states. In parallel, the volume of nuclear material and number of facilities subject to safeguards has been increasing. In the coming years, the IAEA predicts that this trend will continue, in step with an anticipated global increase in nuclear power reactor deployment. At the same time, IAEA resources will be strained by the requirements of safeguarding new commercial-scale nuclear fuel cycle installations, including some using new technologies. Yet, IAEA member states will not be willing to significantly increase the IAEA’s budget to meet growing demand for verification. A few years after the Iraq revelations, the IAEA took a first major step to address the challenge of clandestine activities by creating the Additional Protocol for safeguards. Since 1997, 119 states have concluded such a voluntary agreement with the IAEA, giving the IAEA access to more information that would facilitate detection of undeclared activities. Largely through a broader array of information that a state provides and greater access to locations in the state, the Additional Protocol is designed to permit the IAEA to draw a picture of a state’s complete nuclear fuel cycle, from uranium mining to disposal of nuclear waste. Without the access to information provided by the Additional Protocol, the IAEA cannot express confidence that a state harbors no clandestine activities. The State-Level Approach During the last decade the IAEA has developed what it calls the state-level approach for safeguards, which carries the logic of the Additional Protocol to its ultimate conclusion. If the greatest proliferation threats are from clandestine activities, then the IAEA should aim to derive a holistic picture of a state’s entire nuclear program to obtain any clues that the state might be engaged in undeclared nuclear activities. This is what the state-level approach is meant to do. For each state, the IAEA evaluates its compliance by relying on many information sources. The IAEA’s dossier on a state may contain data provided by the state itself; data the IAEA collected in the field during inspections and visits; commercial satellite imagery; data from specialized international databases, for example on nuclear trade and illicit trafficking; and intelligence information provided by other states. The IAEA compares the state’s declaration on its nuclear activities with the composite picture it draws from all information sources and uses this to plan state-specific safeguard objectives and activities. For states with an Additional Protocol, the IAEA also draws a so-called broader conclusion annually about whether it is confident that all nuclear activities and materials are accounted for. In 2002 the IAEA began introducing changes that are meant to reduce the inspection burden associated with routine verification for countries implementing the Additional Protocol and benefiting from a broader conclusion. The rationale for this so-called integrated safeguards approach was the historical record showing that states with the biggest inventories of nuclear material did not necessarily pose the biggest proliferation risks. The IAEA aims to do inspections where they are most needed, reduce the predictability of its verification activities, and, hopefully, lower costs as the board envisaged when it agreed to the Additional Protocol in 1997. Together, the implementation of the Additional Protocol and integrated safeguards represent a significant departure from the safeguards system originally established four decades ago. In the past, Herman Nackaerts, head of safeguards for the IAEA, said the IAEA applied a “one-size-fits-all approach” and treated every state as a potential proliferator. This meant, he said, that the IAEA spent a great deal of energy verifying the compliance of states that showed no sign of not wanting to fully comply while other states with actual ambitions to deceive “were able to slip under our radar.” Today, the IAEA is increasingly focused on finding undeclared activities, but because its resources are limited it must make differentiated assessments about which states’ nuclear programs pose more risk. In 2010, and for the first time, the IAEA prepared a long-term safeguards strategic plan for the period 2012–2023. Under this plan, the IAEA now aims to elaborate the state-level approach further and extend the scope of its application.

### EIS CP

#### Perm: Do Both

#### ( ) Counterplans should compete with the text of the plan, and not normal means, the plan’s effects, functions or certainty, or a cross-x answer.

#### ( ) Text comp is good:

#### a) Topic education – text comp deters infinite regression to the worst counterplans which short-circuit clash with the aff and never involve topic-research. That kills the two most important benefits of debate.

#### b) Neg ground – they get CPs that compete with the plan text, all the built-in topic CPs, and the net-benefit as a disad.

#### c) Perms – scrabble perms aren’t net-beneficial and never actually happen

#### ( ) Voter because it proves the CP is illegit and not competitive

#### High-risk of short-term food shortages – only increasing CO2 emissions prevents extinction

Sherwood and Idso 10 (Keith and Craig, M.S. in Agronomy from the University of Nebraska - Lincoln, Ph.D. in Geography from Arizona State University, where he studied as one of a small group of University Graduate Scholars "The World's Looming Food and Water Shortage," CO2 Science Magazine, Volume 13, Number 49:8, December, <http://www.co2science.org/articles/V13/N49/EDIT.php>)

Every now and then, various astute observers of man's precarious position on planet earth call our attention to a developing global crisis that seems destined to wreak havoc on the human race a mere forty years from now: a lack of sufficient land and freshwater resources to produce the food that will be required to sustain our growing population. The most recent of this community of researchers to address the approaching problem are Hanjra and Qureshi (2010), who begin their treatment of the subject by quoting Benjamin Franklin's well-known homily: "when the well is dry, we know the worth of water." "Food policy," as the two Australian researchers write, "must not lose sight of surging water scarcity." Stating that "population and income growth will increase the demand for food and water," they indicate that "irrigation will be the first sector to lose water, as water competition by non-agricultural uses increases and water scarcity intensifies." And noting that "increasing water scarcity will have implications for food security, hunger, poverty, and ecosystem health and services," they report that "feeding the 2050 population will require some 12,400 km3 of water, up from 6800 km3 used today." This huge increase, in their words, "will leave a water gap of about 3300 km3 even after improving efficiency in irrigated agriculture, improving water management, and upgrading of rainfed agriculture," as per the findings of de Fraiture et al. (2007), Molden (2007) and Molden et al. (2010). This water deficiency, according to Hanjra and Qureshi, "will lead to a food gap unless concerted actions are taken today." Some of the things they propose, in this regard, are to conserve water and energy resources, develop and adopt climate-resilient crop varieties, modernize irrigation, shore up domestic food supplies, reengage in agriculture for further development, and reform the global food and trade market. And to achieve these goals, they say that "unprecedented global cooperation is required," which by the looks of today's world is an even more remote possibility than that implied by the proverbial wishful thinking. So, on top of everything else they suggest (a goodly portion of which will not be achieved), what can we do to defuse the ticking time-bomb that is the looming food and water crisis? We suggest doing nothing. But not just any "nothing." The nothing we suggest is to not mess with the normal, unforced evolution of civilization's means of acquiring energy. We suggest this, because on top of everything else we may try to do to conserve both land and freshwater resources, we will still fall short of what is needed to be achieved unless the air's CO2 content rises significantly and thereby boosts the water use efficiency of earth's crop plants, as well as that of the plants that provide food and habitat for what could be called "wild nature," enabling both sets of plants to produce more biomass per unit of water used in the process. And to ensure that this happens, we will need all of the CO2 that will be produced by the burning of fossil fuels, until other forms of energy truly become more cost-efficient than coal, gas and oil. In fact, these other energy sources will have to become much more cost-efficient before fossil fuels are phased out; because the positive externality of the CO2-induced increase in plant water use efficiency provided by the steady rise in the atmosphere's CO2 concentration due to the burning of fossil fuels will be providing a most important service in helping us feed and sustain our own species without totally decimating what yet remains of wild nature.

CO2 prevents extinction by solving food shortages without necessitating habitat destruction

Sherwood and Idso 10 (Keith and Craig, "Surviving the Perfect Storm," CO2 Science Magazine, Volume 13, Number 44:3 November, http://www.co2science.org/articles/V13/N44/EDIT.php)

In introducing their review of food security publications pertinent to the challenge of feeding nine billion people just four decades from now, Godfray et al. (2010) note that "more than one in seven people today still do not have access to sufficient protein and energy from their diet and even more suffer some form of micronutrient malnourishment," citing the FAO (2009); and they write that although "increases in production will have an important part to play" in correcting this problem and keeping it from worsening in the future, they state that mankind "will be constrained by the finite resources provided by the earth's lands, oceans and atmosphere," which set of difficulties they describe at the end of their review as comprising a "perfect storm." The first question they ask in regard to how we might successfully navigate this highly restricted terrain is: "How can more food be produced sustainably?" They say that the primary solution to food shortages of the past was "to bring more land into agriculture and to exploit new fish stocks," but they note that there is precious little remaining of either of these pristine resources. Thus, they conclude that "the most likely scenario is that more food will need to be produced from the same or less land," because, as they suggest, "we must avoid the temptation to sacrifice further the earth's already hugely depleted biodiversity for easy gains in food production, not only because biodiversity provides many of the public goods upon which mankind relies, but also because we do not have the right to deprive future generations of its economic and cultural benefits." And, we might add, because we should be enlightened enough to realize that we have a moral responsibility to drive no more species to extinction than we have already sent to that sorry state. So how can these diverse requirements all be met? ... and at one and the same time? A clue comes from Godfray et al.'s statement that "greater water and nutrient use efficiency, as well as tolerance of abiotic stress, are likely to become of increasing importance." And what is there that can bring about all of these changes in mankind's crops? You guessed it: carbon dioxide. Yes, the colorless, odorless, tasteless gas that all of us release to the atmosphere with every breath we exhale fits the bill perfectly. Rising concentrations of atmospheric CO2 increase the photosynthetic prowess of essentially all of earth's plants, while generally reducing the rate at which they simultaneously transfer water from the soil to the air. In addition, more CO2 in the air tends to enhance the efficiency with which plants utilize nutrients in constructing their tissues and producing the edible portions that we and all of earth's animals depend upon for our very existence, as you can read about -- almost interminably -- on our website (check out our Subject Index for a host of related topics), and as you can readily convince yourself is true by perusing our vast Plant Growth Database, which lists the experimentally-derived photosynthetic and biomass production responses of a huge host of different plants to standardized increases in the air's CO2 concentration. Oh, and by the way, you can also spend a few months reading about all of the scientific studies which, taken in their entirety, pretty much demonstrate that the climatic catastrophes prophesied by the world's climate alarmists to result from anthropogenic CO2 emissions are largely devoid of significant real-world substantiation.

### DC

#### Hagel and Brennan noms crush polcap for fiscal battles

Spetalnick 1-7 Matt Spetalnick, “Obama to tap Hagel for Pentagon, Brennan for CIA,” Chicago Tribune, 1/7/2013, http://www.chicagotribune.com/news/sns-rt-us-obama-nominationsbre9060cp-20130107,0,6361684,full.story

WASHINGTON (Reuters) - President Barack Obama on Monday will nominate Republican Chuck Hagel as his next defense secretary and counterterrorism adviser John Brennan to head the CIA, two choices likely to stoke controversy as he fills out his second-term national security team. The selection of Hagel, a maverick former senator and decorated Vietnam veteran tapped to replace Leon Panetta at the Pentagon, appears destined for a bruising Senate confirmation battle against critics who have already launched an onslaught over his record on Israel and Iran. Obama could also face opposition from human rights groups over his choice of Brennan, a CIA veteran who withdrew from consideration for the spy agency's top job in 2008 after questions were raised about his views on enhanced interrogation techniques used on terrorism suspects during the Bush administration. He would succeed retired General David Petraeus, who resigned amid a scandal over an extramarital affair with his biographer. Obama, newly returned from his Hawaii vacation, will announce the two nominations at the White House on Monday afternoon, a senior administration official said. A "personnel announcement" was scheduled for 1:05 p.m. EST (1805 GMT). The addition of Hagel and Brennan, along with Senator John Kerry as nominee for secretary of state, would round out Obama's national security team as he faces daunting challenges of winding down the war in Afghanistan, dealing with the Iranian nuclear standoff and curbing military spending. Obama is backing Hagel for the Pentagon post despite the fact that the former Nebraska lawmaker, even before being nominated, had become a lightning rod for criticism from the left and the right. Former Republican colleagues have joined pro-Israel groups and neoconservatives in questioning his commitment to Israel's security and slamming disparaging remarks about what he once called a "Jewish lobby" in Washington. He has also come under fire for saying in 1998 that a nominee for an ambassadorial post was not qualified because he was "openly, aggressively gay" - a remark for which he has since apologized. Obama's nomination of Hagel suggests that the president did not want to appear weak by seeming to bow to political opposition and being forced to pick someone other than his favorite contender for a top Cabinet post. He backed down last month from a tough Senate confirmation battle over Susan Rice, the U.S. ambassador to the United Nations, his first pick to replace Hillary Clinton as secretary of state, and instead settled on Kerry. But the risk for Obama is that pushing Hagel's nomination could force him to expend political capital he needs more for his next round of fiscal showdowns with congressional Republicans.

#### No compromise – tax standstill

Kephart 1/3 (Tim, CBS News, Washington prepares for next fiscal fight” <http://miami.cbslocal.com/2013/01/03/washington-prepares-for-next-fiscal-fight/>)

That sets the stage for the coming debt ceiling fight near the end of February, when the Treasury Department can no longer take any measures to stave off default.¶ President Barack Obama has said repeatedly that he will not negotiate with Congressional Republicans over the debt ceiling. President Obama said if Republicans were demanding massive spending cuts to discretionary spending and entitlements; he expects more tax revenues through tax reform.¶ Republican Senate Minority Leader Mitch McConnell said the fiscal cliff tax deal was the last word on taxes and Republicans would not agree to any more tax hikes for any reason, according to talkingpointsmemo.com.¶ Congressional Republicans see the debt ceiling as a form of revenge against President Obama and Democrats for having to swallow the tax increases included in the fiscal cliff deal. Republicans said the debt ceiling is the only leverage they have to force spending cuts through the government, according to the Washington Post.

#### DA’s not intrinsic and a logical policy maker could do both – we should debate true opportunity costs to the plan

#### Plan is uniquely insulated from politics – bipartisan consensus

Shaw 12 (Andrew, member of the Government Affairs team where he focuses primarily on energy issues at the intersection of Canada-U.S. relations, uses his knowledge and experience of Congress and the Executive Branch to advise clients on critical energy and environmental public policy issues, “ A “Chunks” Approach to Climate Policy,” 2012, [[www.politicsandlawblog.com/2012/05/15/a-chunks-approach-to-climate-policy/](http://www.politicsandlawblog.com/2012/05/15/a-chunks-approach-to-climate-policy/)], jam)

While ideally President Obama would seek a “comprehensive” approach to climate change, Zichal acknowledged that the Administration would likely approach this issue in “chunks.” Specifically, Zichal talked about seeking “tools and policies that can garner bipartisan support.” One example provided by Zichal was extending the production tax credit for renewable production, which is set to expire at the end of this year. The “chunks” mention appears to reinforce the notion that President Obama would be unlikely to pursue cap-and-trade, or some variant, in a second-term. Following Zichal’s comments, Senator Lamar Alexander (R-TN) spoke – his remarks suggested that there are other “chunks” where consensus is achievable on energy policy between the Administration and Congress. Specifically, Senator Alexander expressed support for the Advanced Research Projects Agency-Energy (ARPA-E), an agency focused on R&D for breakthrough energy technologies, such as small modular reactors, smart grids, carbon capture and electric car batteries. ARPA-E is modeled after the Defense Advanced Research Projects Agency (DARPA), which, among other achievements, helped in inventing the internet. The American Recovery and Reinvestment Act provided the first appropriations for ARPR-E, which has subsequently used that money to fund over 180 projects focused on emerging energy technologies. In an election year, Republicans and Democrats spend an inordinate amount of time highlighting their differences on energy policy. Yet on ARPA-E, both President Obama and Governor Mitt Romney have expressed support for a continued commitment to the program. Senator Alexander’s comments indicate that an important and achievable “chunk” of climate policy, regardless of the outcome of the election, could be a renewed emphasis on ARPA-E.

#### DoD shields link

Lacey 8/16 (Stephen, reporter Climate Progress, B.A. in journalism from Franklin Pierce University, 2012, [thinkprogress.org/climate/2012/08/16/699811/the-solyndra-standard-on-loan-guarantees-military-spending-and-clean-energy-politics/?mobile=nc], jam)

That’s exactly how it’s playing out. The politically-manufactured outrage over Solyndra has turned into an all-out campaign — with tens of millions of dollars being spent this election season specifically targeting federal renewable energy investments. Mitt Romney has jumped on the bandwagon, using Solyndra as a central piece of his campaign. And here’s the really astonishing disconnect: While supporting tens of thousands of jobs, the loan guarantee program is expected to cost $2 billion less than Congress budgeted for, according to an analysis from Herb Allison, John McCain’s former National Finance Chairman. Meanwhile, amidst the Solyndra saga, we casually accept a $300 million aircraft failure without batting an eye. No outrage. No sustained political campaign. It’s just another day testing our military toys. Why? Because we don’t often see programs like this as a “failure” in the political arena. We would never use one failure as an excuse to abandon investment in new technologies. Most politicians accept losses in military R&D expenditures because the long-term gains are potentially so important for national defense and for eventually developing technologies for civilian use. We should always strive to make programs as efficient and cost-effective as possible. But a few bankrupt clean energy companies representing a fraction of the program’s budgeted cost is no excuse for abandoning federal investments in clean energy — a strategically important sector that is becoming one of the largest drivers of business this century. Alas, don’t expect anyone to publicly admit this. As the campaign season unfolds, political leaders are all too willing to practice the Solyndra standard.

#### No impact- printing money solves debt

Krugman 1/2 (Paul, Nobel economist @ Princeton, “Debt in a Time of Zero” NYT <http://krugman.blogs.nytimes.com/2013/01/02/debt-in-a-time-of-zero/>)

I’ve had communications from a number of people asking an interesting question relating to the debt ceiling and other issues: why does the Federal government have to borrow at all? Why can’t it just print money to pay its bills? After all, haven’t people like me been saying that this isn’t actually inflationary?¶ Now, it turns out that there really is a problem, or actually two problems — but they’re a bit subtle.¶ First, as a legal matter the Federal government can’t just print money to pay its bills, with one peculiar exception. Instead, money has to be created by the Federal Reserve, which then puts it into circulation by buying Federal debt. You may say that this is an artificial distinction, because the Fed is effectively part of the government; but legally, the distinction matters, and the debt bought by the Fed counts against the debt ceiling.¶ The peculiar exception is that clause allowing the Treasury to mint platinum coins in any denomination it chooses. Of course this was intended as a way to issue commemorative coins and stuff, not as a fiscal measure; but at least as I understand it, the letter of the law would allow Treasury to stamp out a platinum coin, say it’s worth a trillion dollars, and deposit it at the Fed — thereby avoiding the need to issue debt.¶ In reality, to pursue the thought further, the coin really would be as much a Federal debt as the T-bills the Fed owns, since eventually Treasury would want to buy it back. So this is all a gimmick — but since the debt ceiling itself is crazy, allowing Congress to tell the president to spend money then tell him that he can’t raise the money he’s supposed to spend, there’s a pretty good case for using whatever gimmicks come to hand.

#### No risk or impact to economic decline

Drezner ‘11 Daniel W. Drezner, professor of international politics at the Fletcher School of Law and Diplomacy at Tufts University, “Please come down off the ledge, dear readers,” Foreign Policy, 8/12/11, http://drezner.foreignpolicy.com/posts/2011/08/12/please\_come\_down\_off\_the\_ledge\_dear\_readers

So, when we last left off this debate, things were looking grim. My concern in the last post was that the persistence of hard times would cause governments to take actions that would lead to a collapse of the open global economy, a spike in general riots and disturbances, and eerie echoes of the Great Depression. Let's assume that the global economy persists in sputtering for a while, because that's what happens after major financial shocks. Why won't these other bad things happen? Why isn't it 1931? Let's start with the obvious -- it's not gonna be 1931 because there's some passing familiarity with how 1931 played out. The Chairman of the Federal Reserve has devoted much of his academic career to studying the Great Depression. I'm gonna go out on a limb therefore and assert that if the world plunges into a another severe downturn, it's not gonna be because central bank heads replay the same set of mistakes. The legacy of the Great Depression has also affected public attitudes and institutions that provide much stronger cement for the current system. In terms of [public] attitudes, compare the results of this mid-2007 poll with this mid-2010 poll about which economic system is best. I'll just reproduce the key charts below: The headline of the 2010 results is that there's eroding U.S. support for the global economy, but a few other things stand out. U.S. support has declined, but it's declined from a very high level. In contrast, support for free markets has increased in other major powers, such as Germany and China. On the whole, despite the worst global economic crisis since the Great Depression, public attitudes have not changed all that much. While there might be populist demands to "do something," that something is not a return to autarky or anything so [drastic]. Another big difference is that multilateral economic institutions are much more robust now than they were in 1931. On trade matters, even if the Doha round is dead, the rest of the World Trade Organization's corpus of trade-liberalizing measures are still working quite well. Even beyond the WTO, the complaint about trade is not the deficit of free-trade agreements but the surfeit of them. The IMF's resources have been strengthened as a result of the 2008 financial crisis. The Basle Committee on Banking Supervision has already promulgated a plan to strengthen capital requirements for banks. True, it's a slow, weak-assed plan, but it would be an improvement over the status quo. As for the G-20, I've been pretty skeptical about that group's abilities to collectively address serious macroeconomic problems. That is setting the bar rather high, however. One could argue that the G-20's most useful function is reassurance. Even if there are disagreements, communication can prevent them from growing into anything worse. Finally, a note about the possibility of riots and other general social unrest. The working paper cited in my previous post noted the links between austerity measures and increases in disturbances. However, that paper contains the following important paragraph on page 19: [I]n countries with better institutions, the responsiveness of unrest to budget cuts is generally lower. Where constraints on the executive are minimal, the coefficient on expenditure changes is strongly negative -- more spending buys a lot of social peace. In countries with Polity-2 scores above zero, the coefficient is about half in size, and less significant. As we limit the sample to ever more democratic countries, the size of the coefficient declines. For full democracies with a complete range of civil rights, the coefficient is still negative, but no longer significant. This is good news!! The world has a hell of a lot more democratic governments now than it did in 1931. What happened in London, in other words, might prove to be the exception more than the rule. So yes, the recent economic news might seem grim. Unless political institutions and public attitudes buckle, however, we're unlikely to repeat the mistakes of the 1930's. And, based on the data we've got, that's not going to happen.

### God Thing

#### Calculation concerning the state isn’t purely secular—this presumes an immanence/transcendence dichotomy that the perm deconstructs

Derrida ‘2 Jacques Derrida, Directeur d’Etudes at the Ecole des Hautes Etudes en Sciences Sociales in Paris, and Professor of Philosophy, French and Comparative Literature at the University of California, Irvine, 2002, Acts of Religion, p. 255-57

This excess of justice over law and calculation, this overflowing of the unpre­sentable over the determinable, cannot and should not [ne peut pas et ne doit pas] serve as an alibi for staying out of juridico-political battles, within an institution or a state, between institutions or states. Abandoned to itself, the incalculable and giv­ing [donatrice] idea of justice is always very close to the bad, even to the worst for it can always be reappropriated by the most perverse calculation. It is always possible, and this is part of the madness of which we were speaking. An absolute assurance against this risk can only saturate or suture the opening of the call to justice, a call that is always wounded. But incalculable justice commands calculation. And first of all, closest to what one associates with justice, namely, law, the juridical field that one cannot isolate within sure frontiers, but also in all the fields from which one cannot separate it, which intervene in it and are no longer simply fields: the ethical, the political, the economical, the psycho-sociological, the philosophical, the liter­ary, etc. Not only must one [il faut] calculate, negotiate the relation between the calculable and the incalculable, and negotiate without a rule that would not have to be reinvented there where we are “thrown’ there where we find ourselves; but one must [il faut] do so and take it as far as possible, beyond the place we find our­selves and beyond the already identifiable zones of morality, politics, or law, beyond the distinctions between national and international, public and private, and so on. The order of this il faut does not properly belong either to justice or to law. It only belongs to either realm by exceeding each one in the direction of the other—which means that, in their very heterogeneity, these two orders are undis­sociable: de facto and de jure [en fait et en droit]. Politicization, for example, is interminable even if it cannot and should not ever be total. To keep this from being a truism, or a triviality, one must recognize in it the following consequence: each advance in politicization obliges one to reconsider, and so to reinterpret the very foundations of law such as they had previously been calculated or delimited. This was true for example in the French Declaration of the Rights of Man, in the abolition of slavery, in all the emancipatory battles that remain and will have to remain in progress, everywhere in the world, for men and for women. Nothing seems to me less outdated than the classical emancipatory ideal. One cannot attempt to disqualify it today, whether crudely or with sophistication, without at least some thoughtlessness and without forming the worst complicities. It is true that it is also necessary to re-elaborate, without renouncing, the concept of eman­cipation, enfranchisement, or liberation while taking into account the strange structures we have been describing. But beyond these identified territories of juridico-politicization on the grand geo-political scale, beyond all self-serving misappropriations and hijackings, beyond all determined and particular reappropria­tions of international law, other areas must constantly open up that can at first resemble secondary or marginal areas. This marginality also signifies that a vio­lence, even a terrorism and other forms of hostage taking are at work. The exam­ples closest to us would be found in the area of laws [lois] on the teaching and practice of languages, the legitimization of canons, the military use of scientific research, abortion, euthanasia, problems of organ transplant, extra-uterine con­ception, bio-engineering, medical experimentation, the “social treatment” of AIDS, the macro- or micro-politics of drugs, homelessness, and so on, without forgetting; of course, the treatment of what one calls animal life, the immense question of so-called animality. On this last problem, the Benjamin text that I am coming to now shows that its author was not deaf or insensitive to it, even if his propositions on this subject remain quite obscure or traditional.

#### There is no God

Chad Docterman, 1996, Why the Christian God is Impossible, http://www.positiveatheism.org/writ/imposs.htm

What did God do during that eternity before he created everything? If God was all that existed back then, what disturbed the eternal equilibrium and compelled him to create? Was he bored? Was he lonely? God is supposed to be perfect. If something is perfect, it is complete--it needs nothing else. We humans engage in activities because we are pursuing that elusive perfection, because there is disequilibrium caused by a difference between what we are and what we want to be. If God is perfect, there can be no disequilibrium. There is nothing he needs, nothing he desires, and nothing he must or will do. A God who is perfect does nothing except exist. A perfect creator God is impossible. Perfection begets imperfection But, for the sake of argument, let's continue. Let us suppose that this perfect God did create the universe. Humans were the crown of his creation, since they were created in God's image and have the ability to make decisions. However, these humans spoiled the original perfection by choosing to disobey God. What!? If something is perfect, nothing imperfect can come from it. Someone once said that bad fruit cannot come from a good tree, and yet this "perfect" God created a "perfect" universe which was rendered imperfect by the "perfect" humans. The ultimate source of imperfection is God. What is perfect cannot become imperfect, so humans must have been created imperfect. What is perfect cannot create anything imperfect, so God must be imperfect to have created these imperfect humans. A perfect God who creates imperfect humans is impossible. The Freewill Argument The Christians' objection to this argument involves freewill. They say that a being must have freewill to be happy. The omnibenevolent God did not wish to create robots, so he gave humans freewill to enable them to experience love and happiness. But the humans used this freewill to choose evil, and introduced imperfection into God's originally perfect universe. God had no control over this decision, so the blame for our imperfect universe is on the humans, not God. Here is why the argument is weak. First, if God is omnipotent, then the assumption that freewill is necessary for happiness is false. If God could make it a rule that only beings with freewill may experience happiness, then he could just as easily have made it a rule that only robots may experience happiness. The latter option is clearly superior, since perfect robots will never make decisions which could render them or their creator unhappy, whereas beings with freewill could. A perfect and omnipotent God who creates beings capable of ruining their own happiness is impossible. Second, even if we were to allow the necessity of freewill for happiness, God could have created humans with freewill who did not have the ability to choose evil, but to choose between several good options. Third, God supposedly has freewill, and yet he does not make imperfect decisions. If humans are miniature images of God, our decisions should likewise be perfect. Also, the occupants of heaven, who presumably must have freewill to be happy, will never use that freewill to make imperfect decisions. Why would the originally perfect humans do differently? The point remains: the presence of imperfections in the universe disproves the supposed perfection of its creator. All-good God knowingly creates future suffering God is omniscient. When he created the universe, he saw the sufferings which humans would endure as a result of the sin of those original humans. He heard the screams of the damned. Surely he would have known that it would have been better for those humans to never have been born (in fact, the Bible says this very thing), and surely this all-compassionate deity would have foregone the creation of a universe destined to imperfection in which many of the humans were doomed to eternal suffering. A perfectly compassionate being who creates beings which he knows are doomed to suffer is impossible. Infinite punishment for finite sins God is perfectly just, and yet he sentences the imperfect humans he created to infinite suffering in hell for finite sins. Clearly, a limited offense does not warrant unlimited punishment. God's sentencing of the imperfect humans to an eternity in hell for a mere mortal lifetime of sin is infinitely more unjust than this punishment. The absurd injustice of this infinite punishment is even greater when we consider that the ultimate source of human imperfection is the God who created them. A perfectly just God who sentences his imperfect creation to infinite punishment for finite sins is impossible. Belief more important than action Consider all of the people who live in the remote regions of the world who have never even heard the "gospel" of Jesus Christ. Consider the people who have naturally adhered to the religion of their parents and nation as they had been taught to do since birth. If we are to believe the Christians, all of these people will perish in the eternal fire for not believing in Jesus. It does not matter how just, kind, and generous they have been with their fellow humans during their lifetime: if they do not accept the gospel of Jesus, they are condemned. No just God would ever judge a man by his beliefs rather than his actions. Perfection's imperfect revelation The Bible is supposedly God's perfect Word. It contains instructions to humankind for avoiding the eternal fires of hell. How wonderful and kind of this God to provide us with this means of overcoming the problems for which he is ultimately responsible! The all-powerful God could have, by a mere act of will, eliminated all of the problems we humans must endure, but instead, in his infinite wisdom, he has opted to offer this indecipherable amalgam of books which is the Bible as a means for avoiding the hell which he has prepared for us. The perfect God has decided to reveal his wishes in this imperfect work, written in the imperfect language of imperfect man, translated, copied, interpreted, voted on, and related by imperfect man. No two men will ever agree what this perfect word of God is supposed to mean, since much of it is either self- contradictory, or obscured by enigmatic symbols. And yet the perfect God expects us imperfect humans to understand this paradoxical riddle using the imperfect minds with which he has equipped us. Surely the all-wise and all-powerful God would have known that it would have been better to reveal his perfect will directly to each of us, rather than to allow it to be debased and perverted by the imperfect language and botched interpretations of man. Contradictory justice One need look to no source other than the Bible to discover its imperfections, for it contradicts itself and thus exposes its own imperfection. It contradicts itself on matters of justice, for the same just God who assures his people that sons shall not be punished for the sins of their fathers turns around and destroys an entire household for the sin of one man (he had stolen some of Yahweh's war loot). It was this same Yahweh who afflicted thousands of his innocent people with plague and death to punish their evil king David for taking a census (?!). It was this same Yahweh who allowed the humans to slaughter his son because the perfect Yahweh had botched his own creation. Consider how many have been stoned, burned, slaughtered, raped, and enslaved because of Yahweh's skewed sense of justice. The blood of innocent babies is on the perfect, just, compassionate hands of Yahweh. Contradictory history The Bible contradicts itself on matters of history. A person who reads and compares the contents of the Bible will be confused about exactly who Esau's wives were, whether Timnah was a concubine or a son, and whether Jesus' earthly lineage is through Solomon or his brother Nathan. These are but a few of hundreds of documented historical contradictions. If the Bible cannot confirm itself in mundane earthly matters, how are we to trust it on moral and spiritual matters? Unfulfilled prophecy The Bible misinterprets its own prophecies. Read Isaiah 7 and compare it to Matthew 1 to find but one of many misinterpreted prophecies of which Christians are either passively or willfully ignorant. The fulfillment of prophecy in the Bible is cited as proof of its divine inspiration, and yet here is but one major example of a prophecy whose intended meaning has been and continues to be twisted to support subsequent absurd and false doctrines. There are no ends to which the credulous will not go to support their feeble beliefs in the face of compelling evidence against them. The Bible is imperfect. It only takes one imperfection to destroy the supposed perfection of this alleged Word of God. Many have been found. A perfect God who reveals his perfect will in an imperfect book is impossible. The Omniscient changes the future A God who knows the future is powerless to change it. An omniscient God who is all-powerful and freewilled is impossible. The Omniscient is surprised A God who knows everything cannot have emotions. The Bible says that God experiences all of the emotions of humans, including anger, sadness, and happiness. We humans experience emotions as a result of new knowledge. A man who had formerly been ignorant of his wife's infidelity will experience the emotions of anger and sadness only after he has learned what had previously been hidden. In contrast, the omniscient God is ignorant of nothing. Nothing is hidden from him, nothing new may be revealed to him, so there is no gained knowledge to which he may emotively react. We humans experience anger and frustration when something is wrong which we cannot fix. The perfect, omnipotent God, however, can fix anything. Humans experience longing for things we lack. The perfect God lacks nothing. An omniscient, omnipotent, and perfect God who experiences emotion is impossible. The conclusion of the matter I have offered arguments for the impossibility, and thus the non- existence, of the Christian God Yahweh. No reasonable and freethinking individual can accept the existence of a being whose nature is so contradictory as that of Yahweh, the "perfect" creator of our imperfect universe. The existence of Yahweh is as impossible as the existence of cubic spheres or invisible pink unicorns.

### Neoliberalism K

#### Epistemic critique replicates fascistic knowledge production—only substantive debate breaks down dogma without collapsing into irrelevance

Houghton ‘8 David Patrick Houghton, “Positivism ‘vs’ Postmodernism: Does Epistemology Make a Difference?” International Politics (2008), 45

As long ago as 1981, Yale Ferguson and Richard Mansbach effectively laid the influence of the dogmatic behaviouralism of the 1960s to rest in their book The Elusive Quest, signaling the profound disillusionment of mainstream IR with the idea that a cumulative science of IR would ever be possible (Ferguson and Mansbach, 1988). The popularity of the ‘naı¨ve’ form of positivism, wed to a view of inexorable scientific progress and supposedly practiced by wide-eyed scholars during the 1960s, has long been a thing of the past. Postmodernists hence do the discipline a disservice when they continue to attack the overly optimistic and dogmatic form of positivism as if it still represented a dominant orthodoxy, which must somehow be overthrown. Equally, supporters of the contemporary or ‘neo-’ version of positivism perform a similar disservice when they fail to articulate their epistemological assumptions clearly or at all. Indeed, the first error is greatly encouraged by the second, since by failing to state what they stand for, neo-positivists have allowed postmodernists to fashion a series of straw men who burn rapidly at the slightest touch. Articulating a full list of these assumptions lies beyond the scope of this article, but contemporary neo-positivists are, I would suggest, committed to the following five assumptions, none of which are especially radical or hard to defend: (1) That explaining the social and political world ought to be our central objective, (2) That — subjective though our perceptions of the world may be — many features of the political world are at least potentially explainable. What remains is a conviction that there are at least some empirical propositions, which can be demonstrably shown to be ‘true’ or ‘false’, some underlying regularities that clearly give shape to IR (such as the proposition that democracies do not fight one another), (3) That careful use of appropriate methodological techniques can establish what patterns exist in the political world, (4) That positive and normative questions, though related, are ultimately separable, although both constitute valid and interesting forms of enquiry. There is also a general conviction (5) that careful use of research design may help researchers avoid logical pitfalls in their work. Doubtless, there are some who would not wish to use the term ‘positivism’ as an umbrella term for these five assumptions, in which case we probably require a new term to cover them. But to the extent that there exists an ‘orthodoxy’ in the field of IR today, this is surely it. Writing in 1989, Thomas Biersteker noted that ‘the vast majority of scholarship in international relations (and the social sciences for that matter) proceeds without conscious reflection on its philosophical bases or premises. In professional meetings, lectures, seminars and the design of curricula, we do not often engage in serious reflection on the philosophical bases or implications of our activity. Too often, consideration of these core issues is reserved for (and largely forgotten after) the introductory weeks of required concepts and methods courses, as we socialize students into the profession’ (Biersteker, 1989). This observation — while accurate at the time — would surely be deemed incorrect were it to be made today. Even some scholars who profess regret at the philosophically self-regarding nature of contemporary of IR theory, nevertheless feel compelled to devote huge chunks of their work to epistemological issues before getting to more substantive matters (see for instance Wendt, 1999). The recent emphasis on epistemology has helped to push IR as a discipline further and further away from the concerns of those who actually practice IR. The consequent decline in the policy relevance of what we do, and our retreat into philosophical self-doubt, is ironic given the roots of the field in very practical political concerns (most notably, how to avoid war). What I am suggesting is not that IR scholars should ignore philosophical questions, or that such ‘navel gazing’ is always unproductive, for questions of epistemology surely undergird every vision of IR that ever existed. Rather, I would suggest that the existing debate is sterile and unproductive in the sense that the various schools of thought have much more in common than they suppose; stated more specifically, postpositivists have much more in common than they would like to think with the positivists they seek to condemn. Consequently, to the extent that there is a meaningful dialogue going on with regard to epistemological questions, it has no real impact on what we do as scholars when we look at the world ‘out there’. Rather than focusing on epistemology, it is inevitably going to be more fruitful to subject the substantive claims made by positivists (of all metatheoretical stripes) and postpositivists to the cold light of day. My own view, as the reader may have gathered already, is that the empirical claims of scholars like Der Derian and Campbell will not often stand up to such harsh scrutiny given the inattention to careful evidence gathering betrayed by both, but this is a side issue here; the point is that substantive theoretical and empirical claims, rather than metatheoretical or epistemological ones, ought to be what divides the international relations scene today.

#### Policy changes in energy production can reverberate throughout the socius to reduce inequality and engender a militant pluralistic assemblage

Connolly ’12 William E. Connolly, Krieger-Eisenhower Professor of Political Science at Johns Hopkins University, “Steps toward an Ecology of Late Capitalism,” Theory & Event, Vol. 15, Issue 1, 2012, Muse

3. Today, perhaps the initial target should be on reconstituting established patterns of consumption by a combination of direct citizen actions in consumption choices, publicity of such actions, and social movements to reconstitute the state/market supported infrastructure of consumption. By the infrastructure of consumption I mean state support for market subsystems such as a national highway system, a system of airports, medical care through private insurance, etc., etc., that enable some modes of consumption in the zones of travel, education, diet, retirement, medical care, energy use, health, and education and render others more difficult or expensive to procure.21 To shift several of these in the correct direction would already reduce extant inequalities. To change the infrastructure is also to affect the types of work and investment available. Social movements that work upon the infrastructure and ethos in tandem can make a real difference directly, encourage more people to extend their critical perspectives, and thereby open more people to a militant politics if and as a new disruptive event emerges. Perhaps a cross-state citizen goal should be to construct a pluralist assemblage by moving back and forth between shifts in role performance, revisions in political ideology, and adjustments in political sensibility, doing so to generate enough collective energy to launch a general strike simultaneously in several countries in the near future. Its aim would be to reduce inequality and to reverse the deadly future created by established patterns of climate change by fomenting significant shifts in patterns of consumption, corporate policies, state law and the priorities of interstate organizations. Again, the dilemma of today is that the fragility of things demands shifting and slowing down intrusions into several aspects of nature as we speed up shifts in identity, role performance, cultural ethos, market regulation, and citizen activism.

## 1AR

### Neoliberalism

#### States will always act to preserve security

John Mearsheimer, R. Wendell Harrison Distinguished Service Professor of political science at the University of Chicago and co-director of the Program on International Security Policy, The Tragedy of Great Power Politics, 2001, p. 30-32

The first assumption is that the international system is anarchic, which does not mean that it is chaotic or riven by disorder. It is easy to draw that conclusion, since realism depicts a world characterized by security competition and war. By itself, however, the realist notion of anarchy has nothing to do with conflict; it is an ordering principle, which says that the system comprises independent states that have no central authority above them.4 Sovereignty, in other words, inheres in states because there is no higher ruling body in the international system.5 There is no “government over governments.”6 The second assumption is that great powers inherently possess some offensive military capability, which gives them the wherewithal to hurt and possibly destroy each other. States are potentially dangerous to each other, although some states have more military might than others and are therefore more dangerous. A state’s military power is usually identified with the particular weaponry at its disposal, although even if there were no weapons, the individuals in those states could still use their feet and hands to attack the population of another state. After all, for every neck, there are two hands to choke it. The third assumption is that states can never be certain about other states’ intentions. Specifically, no state can be sure that another state will not use its offensive military capability to attack the first state. This is not to say that states necessarily have hostile intentions. Indeed, all of the states in the system may be reliably benign, but it is impossible to be sure of that judgment because intentions are impossible to divine with 100 percent certainty.7 There are many possible causes of aggression, and no state can be sure that another state is not motivated by one of them.8 Furthermore, intentions can change quickly, so a state’s intentions can be benign one day and hostile the next. Uncertainty about intentions is unavoidable, which means that states can never be sure that other states do not have offensive intentions to go along with their offensive capabilities. The fourth assumption is that survival is the primary goal of great powers. Specifically, states seek to maintain their territorial integrity and the autonomy of their domestic political order. Survival dominates other motives because, once a state is conquered, it is unlikely to be in a position to pursue other aims. Soviet leader Josef Stalin put the point well during a war scare in 1927: “We can and must build socialism in the [Soviet Union]. But in order to do so we first of all have to exist.”9 States can and do pursue other goals, of course, but security is their most important objective. The fifth assumption is that great powers are rational actors. They are aware of their external environment and they think strategically about how to survive in it. In particular, they consider the preferences of other states and how their own behavior is likely to affect the behavior of those other states, and how the behavior of those other states is likely to affect their own strategy for survival. Moreover, states pay attention to the long term as well as the immediate consequences of their actions. As emphasized, none of these assumptions alone dictates that great powers as a general rule *should* behave aggressively toward each other. There is surely the possibility that some state might have hostile intentions, but the only assumption dealing with a specific motive that is common to all states says that their principal objective is to survive, which by itself is a rather harmless goal. Nevertheless, when the five assumptions are married together, they create powerful incentives for great powers to think and act offensively with regard to each other. In particular, three general patterns of behavior result: fear, self-help, and power maximization.

#### The state is not a unified whole—particular apparatuses can be redeployed against neoliberalism particularly on environmental issues

Martin and Pierce ’13 Deborah G. Martin, Joseph Pierce, “Reconceptualizing Resistance: Residuals of the State and Democratic Radical Pluralism,” Antipode, Vol. 45, Issue 1, pp. 61-79, January 2013, DOI: 10.1111/j.1467-8330.2012.00980.x

But the complexity and heterogeneity of actually existing states is often not captured by this overarching narrative. The particularities of the “shape” of the state may offer more resistive potential than is often acknowledged. “The state” is neither monolithic nor static: it is a sedimentary agglomeration of statutes and specific bureaucracies at a variety of scales that evolve over time (Brenner 2004). Some scholars have described the corpus of more Keynesian bureaucracies still existing within the more entrepreneurial, neoliberal state that has emerged as the “residual welfare state” (Lee 2005, 2006; Murphy 2003). This notion of a residual—or sedimented—state is particularly productive for thinking about resistance, as it points to a variety of contingent, historical and scalar potential relations between states and resistance movements, from hostile to accommodating (for example, the US federal government's several positions on the civil disobedience of the civil rights era, and the contrasting regional and municipal state crackdowns on the same disobedience; McAdam 1982). A variety of historical ideologies about the goals of the application of state power (ie New Deal state welfare, post-war Keynesian) that produced various (now residual) state apparatuses have since been largely supplanted by neoliberalism. Yet because these embedded narratives predate contemporary neoliberalism, and because they support discourses about the role of the state which have since been superseded, they may contribute to a basket of state-supported outcomes somewhat orthogonal to the nominal goals of neoliberalism [a point also made by Lake (2002) and Purcell (2008)]. Yet in some cases, their continued existence is tolerated and even enrolled in contemporary economic projects, operating as legal mandates or government agencies and institutions. These residual apparatuses have varying resistive potential, even if they are not actively used resistively. State apparatuses become deactivated (or relatively less activated) through a process that is subtle and lapidary: over time, they are deprioritized, devalued, and defunded, leaving their capacity to regulate private and public interests defanged. Whether the broad political project of defunding the state is an intentional and strategic strategy for isolating its welfare-oriented mechanisms (Harvey 2005), or the casual and to some degree unconscious result of political horsetrading, re-activating these mechanisms can be a part of an ongoing resistive politics. A resistance that conceptualizes itself as partially tactically allied with rather than wholly against the state would want to seek out and deploy these residuals systematically. The EPA, for example, forces business, capital etc to sit down at the table with government defined stakeholders including various communities, environmental groups, or indeed nearly anyone who owns property or has an organized interest in the ecosystem being examined. We argue, then, that left-leaning activists should not concede that state power has been straightforwardly and wholly enrolled in the contemporary project of neoliberalism. Certainly, “the state” is made up of a heterogeneous assemblage of actors and institutional tools, some of which offer immediate opportunities for resistance. Additionally, though, an ongoing engagement with different residual apparatuses borne of varying historical hegemonic regimes offers not only tactical opportunities but discursive ones as well. Such engagements challenge the framing of state action in the service of capital as politically neutral by identifying the existing obligations of the state, as embodied in its own structure, to regulate or interfere with unbridled profit orientation. Working to realize the latent resistive potential of residual state apparatuses is not a replacement for other modes of resistance. We most emphatically are not arguing that the decentered, network-oriented “new” politics which Purcell and others have identified should be abandoned, or are not relevant. Rather, we argue that the state is a field within which such politics are enacted, and is itself fragmented not just by formal scalar divisions (as identified in Boyer 2006; Brenner 2004; Cox 1998), but by sedimented or residual logics. State apparatuses have particular leverage and legitimacy which can be incorporated in resistive efforts to great effect. We illustrate such potential with reference to the Dover Amendment, below.

#### Nuclear is an essential step in energy production—there are no feasible alternatives

Monbiot ’11 George Monbiot, activist, journalist, intellectual, got a metal spike driven through his foot by a security guard while he was protesting a new road in Britain, tried to carry out a citizen’s arrest of John Bolton for his role in instigating the Iraq War, used to be Whitman’s go-to K answer but then he got too radical, finalist in the Lloyds National Screenwriting Prize with his screenplay ‘The Norwegian’, “The double standards of green anti-nuclear opponents,” The Guardian, 3/31/2011, http://www.guardian.co.uk/environment/georgemonbiot/2011/mar/31/double-standards-nuclear

Like most environmentalists, I want renewables to replace fossil fuel, but I realise we make the task even harder if they are also to replace nuclear power. I'm not saying, as many have claimed, that we should drop our concerns about economic growth, consumption, energy efficiency and the conservation of resources. Far from it. What I'm talking about is how we generate the electricity we will need. Given that, like most greens, I would like current transport and heating fuels to be replaced with low-carbon electricity, it's impossible to see, even with maximum possible energy savings, how the electricity supply can do anything other than grow. All the quantified studies I have seen, including those produced by environmental organisations, support this expectation. Ducking the challenge of how it should be produced is not an option. Nor have I changed my politics (and nor for that matter am I an undercover cop, a mass murderer, a eugenicist or, as one marvellous email suggested, "the consort of the devil"). In fact it's surprising how little the politics of energy supply change with the mass-generation technology we choose. Whether or not there is a nuclear component, we are talking about large corporations building infrastructure, generating electricity and feeding it into the grid. My suspicion of big business and my belief that it needs to be held to account remain unchanged.

# Rd 5 vs Cal HP

## 1AC

See rd 2

## 2AC

### Grid Adv

#### Prolonged grid outage wrecks military command and control – escalates from both retaliation and deterrence collapse

Tilford 12 (Robert, Former soldier US Army, infantry, "Cyber attackers could shut down the electric grid for the entire east coast," Jul 27, [www.examiner.com/article/cyber-attackers-could-easily-shut-down-the-electric-grid-for-the-entire-east-coa])

The devastation that the Senator describes is truly unimaginable. To make matters worse a cyber attack that can take out a civilian power grid, for example could also cripple the U.S. military. The senator notes that is that the same power grids that supply cities and towns, stores and gas stations, cell towers and heart monitors also power “every military base in our country.” “Although bases would be prepared to weather a short power outage with backup diesel generators, within hours, not days, fuel supplies would run out”, he said. Which means military command and control centers could go dark. Radar systems that detect air threats to our country would shut Down completely. “Communication between commanders and their troops would also go silent. And many weapons systems would be left without either fuel or electric power”, said Senator Grassley. “So in a few short hours or days, the mightiest military in the world would be left scrambling to maintain base functions”, he said. We contacted the Pentagon and officials confirmed the threat of a cyber attack is something very real. Top national security officials—including the Chairman of the Joint Chiefs, the Director of the National Security Agency, the Secretary of Defense, and the CIA Director— have said, “preventing a cyber attack and improving the nation’s electric grids is among the most urgent priorities of our country” (source: Congressional Record). So how serious is the Pentagon taking all this? Enough to start, or end a war over it, for sure (see video: Pentagon declares war on cyber attacks http://www.youtube.com/watch?v=\_kVQrp\_D0kY&feature=relmfu ). A cyber attack today against the US could very well be seen as an “Act of War” and could be met with a “full scale” US military response. That could include the use of “nuclear weapons”, if authorized by the President.

### Immigration Reform DA

#### Hagel nomination obliterates capital for immigration

Lizza 1-7 Ryan Lizza, “WILL HAGEL SPIKE THE G.O.P.’S FEVER?” New Yorker, 1/7/2013, http://www.newyorker.com/online/blogs/newsdesk/2013/01/how-much-will-the-nomination-of-chuck-hagel-hurt-obamas-second-term-agenda.html

President Obama’s nomination of Chuck Hagel for Defense Secretary has added yet another intense political battle with Republicans to an already busy season for the White House. So how does Hagel fit in? During last year’s Presidential campaign, Barack Obama had a metaphor he often used to describe what needed to happen in Washington in order for his agenda to move forward in 2013. The election, he said, had to “break the fever” of the Republicans. The hope, frequently articulated by White House aides, was that once Obama was reëlected, the main incentive for G.O.P. obstructionism—trying to defeat Obama in 2012 and thus pursue a more favorable fiscal deal with Mitt Romney—would be removed. As a White House aide told me last year, “To get anything done in the second term, the President has to convince the Republican Party that obstructionism is a losing strategy.” But Obama’s victory has made almost no difference in changing the psychology or incentives of the members of the G.O.P. who matter most: the House Republicans. The idea that a bloc of conservative, mostly Southern, Republicans would start to coöperate with the President on issues like tax policy and immigration may have rested on a faulty assumption. The past few weeks of fiscal-cliff drama have taught us that “breaking the fever” was the wrong metaphor. There is no one event—even the election of a President—that can change a political party overnight. Congress is a co-equal branch of government, and House Republicans feel that they have as much of a mandate for their policies as Obama does for his. Shouldn’t House Republicans care that their views on Obama’s priorities, like tax cuts for the rich and immigration, helped cost Romney the White House and will make it difficult for their party’s nominee to win in 2016? In the abstract, many do, but that’s not enough to change the voting behavior of the average House Republican, who represents a gerrymandered and very conservative district. A better metaphor for the coming battles with Congress may be what Woody Hayes, the college-football coach, famously called “three yards and a cloud of dust”: a series of grinding plays where small victories are earned only after lots of intense combat. While the fiscal-cliff showdown demonstrated that there’s potential for bipartisan deal-making in the Senate, passing any Obama priority through the House of Representatives is nearly impossible unless the political pressure is extremely intense. The fiscal-cliff bill passed the House only when Speaker John Boehner’s members realized that their only alternative was blowing up the settlement negotiated by Joe Biden and Mitch McConnell—and accepting all the blame and consequences. That episode offers the White House a general template for the coming fights over spending, immigration, and gun control—three issues where there is very little consensus between Obama and most House Republicans. Deals will have to be negotiated in the Senate and gain the imprimatur of some high-profile Republicans. Then a pressure campaign will have to be mounted to convince Boehner to move the legislation to the floor of the House under rules that allow it to pass with mostly Democratic votes. It’s easier to see how this could happen with the coming budgetary issues, which have deadlines that force action, than for the rest of Obama’s agenda, which is more likely than not to simply die in the House. There simply isn’t much common ground between Obama and most House Republicans on the agenda he’s chosen. On every front, Obama is challenging the G.O.P.’s most intransigent interest groups. He’s taking on the anti-tax activists who have controlled Republican economic thinking for decades. He’s taking on the Republicans’ Tea Party base over immigration, an issue that polls (and the Republican Presidential primaries) have shown to be more intense than almost any other for grassroots conservatives. He’s taking on the previously untouchable National Rifle Association with his coming proposals to regulate firearms. And with today’s nomination of Hagel, Obama will open a new front against Republican neoconservatives, who control foreign policy in the G.O.P. It’s doubtful that the votes to defeat Hagel will materialize in the Senate, but a President’s political capital, especially in a second term, depletes quickly after his election. Even if Obama prevails, the Hagel fight will have a cost to the rest of his agenda.

#### Debt ceiling thumps and no motivation for GOP compromise

Sarlin 1/3 (Benjy, TPM, "Debt Fight Threatens to Overshadow Obama's Immigratino Push," [tpmdc.talkingpointsmemo.com/2013/01/debt-fight-threatens-to-overshadow-obamas-immigration-push.php])

President Obama may be celebrating a victory on taxes over the House GOP this week, but the fiscal cliff agreement sets up an even nastier spending battle in the coming months, potentially complicating what was supposed to be his No. 1 legislative priority: immigration reform. Supporters of reform insist that Obama and Congress can walk and chew gum at the same time, especially given that the same demographic trends sending panicked Republicans to the negotiating table will persist. “There’s still a 2014 election scheduled,” Laura Vazquez, a legislative analyst for the National Council of La Raza, told TPM. “The president wants to move quickly with the momentum coming out of the election, which gives us a chance to get started very soon — as soon as the inauguration happens we’re ready to go.” Unfortunately for Obama and his reform allies, the fiscal cliff fight that dominated Washington’s attention since the election is only extended by the deal struck this week. Scheduled spending cuts to defense and domestic programs are postponed for two months, and Republicans are threatening a simultaneous standoff over the debt ceiling. As the president made clear in his statement announcing the fiscal cliff deal, every minute spent on these issues eats at his other priorities, a list that now includes gun control as well: “We can settle this debate, or at the very least, not allow it to be so all-consuming all the time that it stops us from meeting a host of other challenges that we face — creating jobs, boosting incomes, fixing our infrastructure, fixing our immigration system, protecting our planet from the harmful effects of climate change, boosting domestic energy production, protecting our kids from the horrors of gun violence.” Immigration advocates are still expecting big movement this month from the White House on comprehensive reform, especially in the president’s State of the Union address. With Republican leaders publicly calling for a debate on the issue before the 2014 elections in the hopes of winning over Latino voters, Obama still has his best shot yet at moving a bill through Congress. But there are still plenty of things that can derail reform efforts, some possibly exacerbated by an extended debate on taxes and spending. Republican presidential candidates are threatened by an energized Latino vote, but most members of Congress are in safe districts where their biggest threat is a conservative primary challenger. The closer the 2014 election season gets, the more skittish those Members could grow about taking difficult votes even as national party builders demand swift action.

#### PC won’t effect Boehner or the House

Sarlin 1/3 (Benjy, TPM, "Debt Fight Threatens to Overshadow Obama's Immigratino Push," [tpmdc.talkingpointsmemo.com/2013/01/debt-fight-threatens-to-overshadow-obamas-immigration-push.php])

But there’s no guarantee that Boehner, whose hold on his conference is at the weakest of his tenure, will want to invite yet another GOP civil war to pass a White House priority loathed by a substantial portion of his members. If the debt ceiling talks widen the rift between him and the rank and file, immigration could become that much harder to advance. While Fitz suggested that immigration should be a much easier sell to the average Republican than violating a tax pledge, he expressed concern that moderates might lay low, leaving more restrictionist voices, like Iowa Rep. Steve King (R-IA), to rally opposition in conservative media. “The most extreme end up becoming the face of the party on this issue, but it’s clearly not where the Republican majority’s voters are,” he said. “The majority of them are like Democrats and independents in supporting realistic reforms that enable the undocumented population to earn citizenship over time.”

#### Plan is uniquely insulated from politics – bipartisan consensus

Shaw 12 (Andrew, member of the Government Affairs team where he focuses primarily on energy issues at the intersection of Canada-U.S. relations, uses his knowledge and experience of Congress and the Executive Branch to advise clients on critical energy and environmental public policy issues, “ A “Chunks” Approach to Climate Policy,” 2012, [[www.politicsandlawblog.com/2012/05/15/a-chunks-approach-to-climate-policy/](http://www.politicsandlawblog.com/2012/05/15/a-chunks-approach-to-climate-policy/)], jam)

While ideally President Obama would seek a “comprehensive” approach to climate change, Zichal acknowledged that the Administration would likely approach this issue in “chunks.” Specifically, Zichal talked about seeking “tools and policies that can garner bipartisan support.” One example provided by Zichal was extending the production tax credit for renewable production, which is set to expire at the end of this year. The “chunks” mention appears to reinforce the notion that President Obama would be unlikely to pursue cap-and-trade, or some variant, in a second-term. Following Zichal’s comments, Senator Lamar Alexander (R-TN) spoke – his remarks suggested that there are other “chunks” where consensus is achievable on energy policy between the Administration and Congress. Specifically, Senator Alexander expressed support for the Advanced Research Projects Agency-Energy (ARPA-E), an agency focused on R&D for breakthrough energy technologies, such as small modular reactors, smart grids, carbon capture and electric car batteries. ARPA-E is modeled after the Defense Advanced Research Projects Agency (DARPA), which, among other achievements, helped in inventing the internet. The American Recovery and Reinvestment Act provided the first appropriations for ARPR-E, which has subsequently used that money to fund over 180 projects focused on emerging energy technologies. In an election year, Republicans and Democrats spend an inordinate amount of time highlighting their differences on energy policy. Yet on ARPA-E, both President Obama and Governor Mitt Romney have expressed support for a continued commitment to the program. Senator Alexander’s comments indicate that an important and achievable “chunk” of climate policy, regardless of the outcome of the election, could be a renewed emphasis on ARPA-E.

#### DoD shields link

Lacey 8/16 (Stephen, reporter Climate Progress, B.A. in journalism from Franklin Pierce University, 2012, [thinkprogress.org/climate/2012/08/16/699811/the-solyndra-standard-on-loan-guarantees-military-spending-and-clean-energy-politics/?mobile=nc], jam)

That’s exactly how it’s playing out. The politically-manufactured outrage over Solyndra has turned into an all-out campaign — with tens of millions of dollars being spent this election season specifically targeting federal renewable energy investments. Mitt Romney has jumped on the bandwagon, using Solyndra as a central piece of his campaign. And here’s the really astonishing disconnect: While supporting tens of thousands of jobs, the loan guarantee program is expected to cost $2 billion less than Congress budgeted for, according to an analysis from Herb Allison, John McCain’s former National Finance Chairman. Meanwhile, amidst the Solyndra saga, we casually accept a $300 million aircraft failure without batting an eye. No outrage. No sustained political campaign. It’s just another day testing our military toys. Why? Because we don’t often see programs like this as a “failure” in the political arena. We would never use one failure as an excuse to abandon investment in new technologies. Most politicians accept losses in military R&D expenditures because the long-term gains are potentially so important for national defense and for eventually developing technologies for civilian use. We should always strive to make programs as efficient and cost-effective as possible. But a few bankrupt clean energy companies representing a fraction of the program’s budgeted cost is no excuse for abandoning federal investments in clean energy — a strategically important sector that is becoming one of the largest drivers of business this century. Alas, don’t expect anyone to publicly admit this. As the campaign season unfolds, political leaders are all too willing to practice the Solyndra standard.

#### Business and bipartisan political support for the plan

Tindale 11 (Stephen, associate fellow at the Centre for European Reform, June 2011, "Thorium: How to save Europe's nuclear revival," [www.cer.org.uk/sites/default/files/publications/attachments/pdf/2011/pb\_thorium\_june11-153.pdf], jam)

In the US, political interest in thorium molten salt reactors is cross-party, having been led by Democratic Senator Harry Reid and Republican Senator Orrin Hatch. Reid and Hatch have introduced three bills to Congress, all of which identified thorium fuel cycle technology as a means to expand nuclear power without increasing waste or nuclear proliferation. When he entered office, President Barack Obama set up a Blue Ribbon Commission on America’s nuclear future, which is considering nuclear fuel cycles and nuclear waste against criteria of “cost, safety, resource utilisation and sustainability, and the promotion of nuclear non-proliferation and counter-terrorism goals”.11 The Commission will publish a draft report in July 2011 and a final report in January 2012. US Energy Secretary Steven Chu has already indicated that he thinks thorium and molten salt reactors are the way forward for nuclear energy: “We cannot continue to improve the condition of people throughout the world without use of nuclear power. None of the renewable energy solutions can be scaled quickly enough to meet current and future energy needs. Safer, proliferation resistant, nuclear power without the long term high level waste storage problems is needed to power a growing world economy and to allow all nations to provide for and feed their growing populations in peace. These goals are available by changing the nuclear fuel cycle to a U233/Thorium fuel cycle.”12 Large US energy companies have not yet shown serious interest in molten salt reactors. However, Microsoft’s Bill Gates has set up a company called TerraPower with the aim of developing a nuclear energy system which reduces the weapons proliferation risk and allows the re-use of spent nuclear fuel. TerraPower has identified thorium molten salt reactors as a promising means of achieving these objectives. Other US companies are part of a consortium, with Japanese and Russian companies, to develop a molten salt reactor. Japanese companies involved include Toyota, Toshiba and Hitachi.

#### Extended grid outage wrecks military power projection and war fighting capabilities

Stockton 11 (Paul, assistant secretary of defense for Homeland Defense and Americas’ Security Affairs, served as director of the Naval Postgraduate School’s Center for Homeland Defense and Security, "Ten Years After 9/11: Challenges for the Decade to Come," [www.hsaj.org/?fullarticle=7.2.11], jam)

The cyber threat to the DIB is only part of a much larger challenge to DoD. Potential adversaries are seeking asymmetric means to cripple our force projection, warfighting, and sustainment capabilities, by targeting the critical civilian and defense supporting assets (within the United States and abroad) on which our forces depend. This challenge is not limited to man-made threats; DoD must also execute its mission-essential functions in the face of disruptions caused by naturally occurring hazards.20 Threats and hazards to DoD mission execution include incidents such as earthquakes, naturally occurring pandemics, solar weather events, and industrial accidents, as well as kinetic or virtual attacks by state or non-state actors. Threats can also emanate from insiders with ties to foreign counterintelligence organizations, homegrown terrorists, or individuals with a malicious agenda. From a DoD perspective, this global convergence of unprecedented threats and hazards, and vulnerabilities and consequences, is a particularly problematic reality of the post-Cold War world. Successfully deploying and sustaining our military forces are increasingly a function of interdependent supply chains and privately owned infrastructure within the United States and abroad, including transportation networks, cyber systems, commercial corridors, communications pathways, and energy grids. This infrastructure largely falls outside DoD direct control. Adversary actions to destroy, disrupt, or manipulate this highly vulnerable homeland- and foreign-based infrastructure may be relatively easy to achieve and extremely tough to counter. Attacking such “soft,” diffuse infrastructure systems could significantly affect our military forces globally – potentially blinding them, neutering their command and control, degrading their mobility, and isolating them from their principal sources of logistics support. The Defense Critical Infrastructure Program (DCIP) under Mission Assurance seeks to improve execution of DoD assigned missions to make them more resilient. This is accomplished through the assessment of the supporting commercial infrastructure relied upon by key nodes during execution. By building resilience into the system and ensuring this support is well maintained, DoD aims to ensure it can "take a punch as well as deliver one."21 It also provides the department the means to prioritize investments across all DoD components and assigned missions to the most critical issues faced by the department through the use of risk decision packages (RDP).22 The commercial power supply on which DoD depends exemplifies both the novel challenges we face and the great progress we are making with other federal agencies and the private sector. Today’s commercial electric power grid has a great deal of resilience against the sort of disruptive events that have traditionally been factored into the grid’s design. Yet, the grid will increasingly confront threats beyond that traditional design basis. This complex risk environment includes: disruptive or deliberate attacks, either physical or cyber in nature; severe natural hazards such as geomagnetic storms and natural disasters with cascading regional and national impacts (as in NLE 11); long supply chain lead times for key replacement electric power equipment; transition to automated control systems and other smart grid technologies without robust security; and more frequent interruptions in fuel supplies to electricity-generating plants. These risks are magnified by globalization, urbanization, and the highly interconnected nature of people, economies, information, and infrastructure systems. The department is highly dependent on commercial power grids and energy sources. As the largest consumer of energy in the United States, DoD is dependent on commercial electricity sources outside its ownership and control for secure, uninterrupted power to support critical missions. In fact, approximately 99 percent of the electricity consumed by DoD facilities originates offsite, while approximately 85 percent of critical electricity infrastructure itself is commercially owned. This situation only underscores the importance of our partnership with DHS and its work to protect the nation’s critical infrastructure – a mission that serves not only the national defense but also the larger national purpose of sustaining our economic health and competitiveness. DoD has traditionally assumed that the commercial grid will be subject only to infrequent, weather-related, and short-term disruptions, and that available backup power is sufficient to meet critical mission needs. As noted in the February 2008 Report of the Defense Science Board Task Force on DoD Energy Strategy, “In most cases, neither the grid nor on-base backup power provides sufficient reliability to ensure continuity of critical national priority functions and oversight of strategic missions in the face of a long term (several months) outage.”23 Similarly, a 2009 GAO Report on Actions Needed to Improve the Identification and Management of Electrical Power Risks and Vulnerabilities to DoD Critical Assets stated that DoD mission-critical assets rely primarily on commercial electric power and are vulnerable to disruptions in electric power supplies.24 Moreover, these vulnerabilities may cascade into other critical infrastructure that uses the grid – communications, water, transportation, and pipelines – that, in turn, is needed for the normal operation of the grid, as well as its quick recovery in emergency situations. To remedy this situation, the Defense Science Board (DSB) Task Force recommended that DoD take a broad-based approach, including a focused analysis of critical functions and supporting assets, a more realistic assessment of electricity outage cause and duration, and an integrated approach to risk management that includes greater efficiency, renewable resources, distributed generation, and increased reliability. DoD Mission Assurance is designed to carry forward the DSB recommendations. Yet, for a variety of reasons – technical, financial, regulatory, and legal – DoD has limited ability to manage electrical power demand and supply on its installations. As noted above, DHS is the lead agency for critical infrastructure protection by law and pursuant to Homeland Security Presidential Directive 7. The Department of Energy (DOE) is the lead agency on energy matters. And within DoD, energy and energy security roles and responsibilities are distributed and shared, with different entities managing security against physical, nuclear, and cyber threats; cost and regulatory compliance; and the response to natural disasters. And of course, production and delivery of electric power to most DoD installations are controlled by commercial entities that are regulated by state and local utility commissions. The resulting paradox: DoD is dependent on a commercial power system over which it does not – and never will – exercise control.

#### The necessity of “competitiveness” is empirically denied – perpetuating it causes serial economic policy failure

Krugman 94 (Paul, Professor of Economics and International Affairs at the Woodrow Wilson School of Public and International Affairs at Princeton University, Centenary Professor at the London School of Economics, won the Nobel Prize in economics, "COMPETITIVENESS- A DANGEROUS OBSESSION," Mar/Apr, vol. 73, no. 2, [www.pkarchive.org/global/pop.html], jam)

THE HYPOTHESIS IS WRONG In June 1993, Jacques Delors made a special presentation to the leaders of the nations of the European Community, meeting in Copenhagen, on the growing problem of European unemployment. Economists who study the European situation were curious to see what Delors, president of the EC Commission, would say. Most of them share more or less the same diagnosis of the European problem: the taxes and regulations imposed by Europe's elaborate welfare states have made employers reluctant to create new jobs, while the relatively generous level of unemployment benefits has made workers unwilling to accept the kinds of low-wage jobs that help keep unemployment comparatively low in the United States. The monetary difficulties associated with preserving the European Monetary System in the face of the costs of German reunification have reinforced this structural problem. It is a persuasive diagnosis, but a politically explosive one, and everyone wanted to see how Delors would handle it. Would he dare tell European leaders that their efforts to pursue economic justice have produced unemployment as an unintended by-product? Would he admit that the ems could be sustained only at the cost of a recession and face the implications of that admission for European monetary union? Guess what? Delors didn't confront the problems of either the welfare state or the ems. He explained that the root cause of European unemployment was a lack of competitiveness with the United States and Japan and that the solution was a program of investment in infrastructure and high technology. It was a disappointing evasion, but not a surprising one. After all, the rhetoric of competitiveness -- the view that, in the words of President Clinton, each nation is "like a big corporation competing in the global marketplace" -- has become pervasive among opinion leaders throughout the world. People who believe themselves to be sophisticated about the subject take it for granted that the economic problem facing any modern nation is essentially one of competing on world markets -- that the United States and Japan are competitors in the same sense that Coca-Cola competes with Pepsi -- and are unaware that anyone might seriously question that proposition. Every few months a new best-seller warns the American public of the dire consequences of losing the "race" for the 21st century. A whole industry of councils on competitiveness, "geo-economists" and managed trade theorists has sprung up in Washington. Many of these people, having diagnosed America's economic problems in much the same terms as Delors did Europe's, are now in the highest reaches of the Clinton administration formulating economic and trade policy for the United States. So Delors was using a language that was not only convenient but comfortable for him and a wide audience on both sides of the Atlantic. Unfortunately, his diagnosis was deeply misleading as a guide to what ails Europe, and similar diagnoses in the United States are equally misleading. The idea that a country's economic fortunes are largely determined by its success on world markets is a hypothesis, not a necessary truth; and as a practical, empirical matter, that hypothesis is flatly wrong. That is, it is simply not the case that the world's leading nations are to any important degree in economic competition with each other, or that any of their major economic problems can be attributed to failures to compete on world markets. The growing obsession in most advanced nations with international competitiveness should be seen, not as a well-founded concern, but as a view held in the face of overwhelming contrary evidence. And yet it is clearly a view that people very much want to hold -- a desire to believe that is reflected in a remarkable tendency of those who preach the doctrine of competitiveness to support their case with careless, flawed arithmetic. This article makes three points. First, it argues that concerns about competitiveness are, as an empirical matter, almost completely unfounded. Second, it tries to explain why defining the economic problem as one of international competition is nonetheless so attractive to so many people. Finally, it argues that the obsession with competitiveness is not only wrong but dangerous, skewing domestic policies and threatening the international economic system. This last issue is, of course, the most consequential from the standpoint of public policy. Thinking in terms of competitiveness leads, directly and indirectly, to bad economic policies on a wide range of issues, domestic and foreign, whether it be in health care or trade.

#### Debt ceiling, gun control fights first

WaPost 1/3 (White House pushes forward on immigration ahead of bigger reform fight, <http://www.washingtonpost.com/politics/white-house-seems-poised-to-retool-deportation-laws/2013/01/03/7cb52930-55db-11e2-8b9e-dd8773594efc_story.html>)

Although Obama has pledged to push for comprehensive legislation early in his second term, the White House’s timetable has been complicated by the prospect of another round of fiscal negotiations over the debt ceiling in February and the president’s pledge to support a gun-control bill in the wake of the mass school shooting in Newtown, Conn.¶ Both of those issues are likely to embroil the White House in bitter, time-consuming political battles with Republicans, particularly in the GOP-controlled House. Advocates said they are hopeful that Republicans will respond more favorably to immigration reform because the party is eager to broaden its appeal to minority groups in the wake of Obama’s election victory.

### NNSA T/O DA

#### There’s government-trained personnel for nuke

Robitaille 12 (George, Department of Army Civilian, United States Army War College, “Small Modular Reactors: The Army’s Secure Source of Energy?” 21-03-2012, Strategy Research Project)

Expansion of Reporting Requirements Regarding Department of Defense Energy Efficiency Programs,” requires the Secretary of Defense to evaluate the cost and feasibility of a policy that would require new power generation projects established on installations to be able to provide power for military operations in the event of a commercial grid outage.28 A potential solution to meet this national security requirement, as well as the critical needs of nearby towns, is for DoD to evaluate SMRs as a possible source for safe and secure electricity. Military facilities depend on reliable sources of energy to operate, train, and support national security missions. The power demand for most military facilities is not very high, and could easily be met by a SMR. Table 1 provides the itemized description of the annual energy requirements in megawatt of electricity (MWe) required for the three hundred seventy four DoD installations.29 DoD History with SMRs The concept of small reactors for electrical power generation is not new. In fact, the DoD built and operated small reactors for applications on land and at sea. The U.S. Army operated eight nuclear power plants from 1954 to 1977. Six out of the eight reactors built by the Army produced operationally useful power for an extended period, including the first nuclear reactor to be connected and provide electricity to the commercial grid. 30 The Army program that built and operated compact nuclear reactors was ended after 1966, not because of any safety issues, but strictly as a result of funding cuts in military long range research and development programs. In essence, it was determined that the program costs could only be justified if there was a unique DoD specific requirement. At the time there were none.31 Although it has been many years since these Army reactors were operational, the independent source of energy they provided at the time is exactly what is needed again to serve as a secure source of energy today. Many of the nuclear power plant designs used by the Army were based on United States Naval reactors. Although the Army stopped developing SMRs, the Navy as well as the private sector has continued to research, develop, and implement improved designs to improve the safety and efficiency of these alternative energy sources. The U.S. Navy nuclear program developed twenty seven different power plant systems and almost all of them have been based on a light water reactor design.32 This design focus can be attributed to the inherent safety and the ability of this design to handle the pitch and roll climate expected on a ship at sea. To date, the U. S Navy operated five hundred twenty six reactor cores in two hundred nineteen nuclear powered ships, accumulated the equivalent of over six thousand two hundred reactor years of operation and safely steamed one hundred forty nine million miles. The U.S. Navy has never experienced a reactor accident.33 All of the modern Navy reactors are design to use fuel that is enriched to ninety three percent Uranium 235 (U235) versus the approximate three percent U235 used in commercial light water reactors. The use of highly enriched U235 in Navy vessels has two primary benefits, long core lives and small reactor cores.34 The power generation capability for naval reactors ranges from two hundred MWe (megawatts of electricity) for submarines to five hundred MWe for an aircraft carrier. A Naval reactor can expect to operate for at least ten years before refueling and the core has a fifty year operational life for a carrier or thirty to forty years for a submarine.35 As an example, the world’s first nuclear carrier, the USS Enterprise, which is still operating, celebrated fifty years of operations in 2011.36 The Navy nuclear program has set a precedent for safely harnessing the energy associated with the nuclear fission reaction. In addition, the Navy collaborates with the private sector to build their reactors and then uses government trained personnel to serve as operators. Implementing the use of SMRs as a secure source of energy for our critical military facilities will leverage this knowledge and experience.

#### Plenty of expertise

Armond Cohen 12, Executive Director of the Clean Air Task Force, “DoD: A Model for Energy Innovation?”, May 29, <http://www.catf.us/blogs/ahead/2012/05/29/dod-a-model-for-energy-innovation/>

Unlike most other agencies, including the Energy Department, the Pentagon is the ultimate customer for the new technology it helps create, spending some $200 billion each year on R&D and procurement. The implications of DoD’s role as customer have not been widely appreciated, as: · DoD, uniquely in government, supports multi-year, billion-dollar “end to end” innovation efforts that produce technology that is continuously tested, deployed and refined on bases and in the field, providing real world feedback that leads to increases in performance and reductions in cost. By contrast, most of the federal government’s civilian energy innovation efforts involve research loosely connected at best with the few commercialization efforts that it supports. · DoD and its contractors know how to bring together multiple innovations to achieve system-level advances leading to big performance gains (examples range from nuclear submarines to unmanned aircraft to large-scale information systems). This systems approach is precisely what is needed to advance clean energy technologies. · Relatively stable, multi-year funding allows the Pentagon to pursue “long cycle” innovation that is necessary for large, capital- intensive technologies and supports a highly capable contractor base that can respond to changing national security demands. · The Pentagon’s scope and budget has allowed it to experiment with new and creative innovation tools such as the well-known Defense Advanced Projects Research Agency, which has produced extraordinary technological breakthroughs; and the Environmental Security Technology Certification Program, which develops and demonstrates cost-effective improvements in environmental and energy technologies for military installations and equipment. · Because of DoD’s size and demands for performance and reliability, it is unique among government and private sector organizations as a demonstration test-bed. Smart-grid technologies and advanced energy management systems for buildings are already poised to benefit from this aspect of the Pentagon’s innovation system. · DoD has collaborated effectively with other federal agencies, including the Department of Energy and its predecessors (for example, to advance nuclear energy technologies). Continuing competition and cooperation between DoD and DOE will spur energy innovation.  DoD’s innovation capabilities can enhance U.S. national security, improve U.S. international competitiveness, and spur global energy restructuring and greenhouse gas emissions reductions. At the same time, while providing enormous opportunities to develop and test energy efficiency technologies and small scale distributed energy appropriate to forward bases, the Pentagon is unlikely to become an all-purpose hub for advancing all categories of clean-energy technologies, because its energy innovation activities will be sustainable only where they can support the nation’s defense capabilities. Therefore, many other large-scale technologies that are of great importance to improving the environment, such as carbon-free central station generation or zero carbon transportation, may not as easily fit with DoD’s mission. Possible exceptions might include small modular nuclear reactors that can be used for producing independent, non-grid power at military bases, or, conceivably, zero-carbon liquid fuels other than anything resembling current generation biofuels.

#### No workforce crisis

Hosek 8 (James, and Titus Galama, National Defense Research Institute at RAND, PhD Economics @ Chicago “U.S. Competitiveness in Science and Technology,” http://www.rand.org/pubs/monographs/2008/RAND\_MG674.pdf)

We consider two indicators of shortage—unusually low unemployment and high wage growth for scientists and engineers—and we make comparisons relative to past trends within science and engineering and relative to other high-skill occupations. These are only broad indicators. There may be no broad evidence of a shortage, yet a shortage could be present at a micro-level—for instance, at a particular moment a firm can have difficulty finding enough qualified engineers to meet its hiring requirements. If micro-level shortages were widely present and persistent, they would result in lower unemployment and faster wage growth, as firms adjusted their hiring standards and wage offers. The unemployment rate has been the same in S&E occupations as in non-S&E occupations, except during the 1991 recession and the years following the end of the dot.com boom at the end of the 1990s, when the S&E unemployment rate was higher (see Figure 3.17). The greater cyclical sensitivity of S&E unemployment in 1991 and the early 2000s deserves further investigation, but it might be related to the rapid expansion in employment that occurred in information technology (see below). Workers not educated in S&E may have entered occupations classified as “computer science” or “information technology” and been counted as S&E workers, yet were more expendable by firms hit hard by the downturn. Figure 3.18 presents a three-year moving average of the median salary from 1989 to 2004 for workers with at least a bachelor’s degree, with separate trend lines for scientists and engineers, lawyers, doctors and other non-S&E occupations. Doctors, lawyers, and many scientists and engineers have a professional degree or a doctorate in addition to a bachelor’s degree, so it is not surprising that their median salaries are higher than for other non-S&E occupations. But the figure is useful in showing the change in median salary over time, where we find average annual increases of 1.8 percent for doctors and 0.8 percent for lawyers compared with 0.9 percent for scientists and engineers, over 1995 to 2005. Salaries in non-S&E occupations excluding lawyers and medical doctors grew at only 0.3 percent per year. In sum, unemployment and wage growth patterns are thus not unusual and do not point to the presence of a chronic or cyclical shortage in S&E. Indeed, Trivedi (2006) argues that there is an oversupply of PhDs in the life sciences.

### Adv CP

#### Federal cost incentives are the only way to make SMRs competitive

Rosner & Goldberg 11 (Robert, William E. Wrather Distinguished Service Professor, Departments of Astronomy and Astrophysics, and Physics, and the College at the U of Chicago, and Stephen, Energy Policy Institute at Chicago, The Harris School of Public Policy Studies, "Small Modular Reactors - Key to Future Nuclear Power Generation in the U.S.," November 2011, [https://epic.sites.uchicago.edu/sites/epic.uchicago.edu/files/uploads/EPICSMRWhitePaperFinalcopy.pdf], jam)

Stage 4. SMR Commercial Learning: Deployment of additional SMR plants and ¶ modules in sufficient quantity to achieve the benefits of learning in manufacturing. Based ¶ on a hypothetical SMR plant configuration (consisting of six 100-MW modules per ¶ plant), the study team estimated that up to nine SMR plants (a LEAD plant and up to ¶ eight FOAK plants) will be needed to achieve the full benefits of learning, at a 10% ¶ learning rate. The present analysis suggests that the estimated LCOE from several of the ¶ early FOAK plants would be higher than market competitive costs. As discussed earlier, ¶ closing this gap will require some combination of innovative business arrangements, ¶ carefully targeted markets, possible federal market transformation efforts (such as clean ¶ electricity purchases), and production cost incentives. The size of any production cost ¶ incentive would be determined case by case based on learning rate targets and would ¶ diminish as FOAK plants move down the learning curve. In the aggregate, the average ¶ magnitude of the incentive would be less than the current $18/MWh (1.8¢/kWh) credit ¶ currently available for new renewable and GW-scale nuclear electric generation plants. ¶ The study team believes that perhaps several FOAK plants could be exported for ¶ deployment in foreign markets, contributing to the learning process while avoiding the ¶ cost of domestic production incentives. Electricity market prices are higher in many ¶ countries that may be interested in SMR plants than those in the U.S., creating an ¶ opportunity for early FOAK plants to be cost competitive. Any FOAK plants for export ¶ would need to be targeted to countries that have established nuclear energy ¶ infrastructures and regulatory regimes, particularly in the areas of nuclear safety and ¶ nuclear nonproliferation; these infrastructures and regimes would also need to have been ¶ reviewed thoroughly by international organizations. The FOAK plants exported to ¶ foreign markets might qualify under existing federal export credit assistance programs, ¶ especially in instances where U.S. companies are in competition with state-owned or ¶ state-aligned enterprises with access to financing on favorable terms. ¶ Success at this stage would be determined by the actual rate of learning in FOAK ¶ modules and the ability to successfully deploy SMR plants within cost, performance, and ¶ incentive target levels. ¶ Stage 5. Fully Commercial, Competitive SMR Industry: Fully commercial SMR ¶ industry, competitive with natural gas-fired generation as a base-load generation ¶ technology. If the learning process for the LEAD and FOAK plants is successful in ¶ meeting the cost parameters identified in the present analysis, there would be no need for ¶ any federal incentives for NOAK plants. If a price for carbon is established, this would ¶ further enhance the competitiveness of NOAK SMR plants relative to fossil fuel ¶ generation alternatives.

#### Capital costs, not regulations, prevent SMRs – subsidies are key to make SMRs cost competitive

Mylan 11 (Christopher T., Department of Environmental Science, Allegheny College, ""Revival of Nuclear Energy in the United States," Apr, [https://sakai.allegheny.edu/access/content/group/00093ca1-5eaf-4a09-be6e-f1bcb5815f70/2011PDFs/mylan\_christopher.pdf], jam)

Financial costs for nuclear energy in both the old and new data have proven to be the largest issue associated with new reactor construction. Largely due to the billions of dollar upfront capital costs, nuclear facilities cannot be built solely by one stakeholder. However, in recent data, nuclear energy needs to not have lower costs compared to competing energies. This is due to 2010 study by the French Energy and Climate Directorate indicating that when nuclear plants run on 68% capacity factor or over, nuclear energy was cheaper than coal or gas combined cycle. This study has shed new light on confronting the financial barriers associated with nuclear energy and, in many other countries, has propelled international nuclear expansion and production. But, because the initial costs remain incredibly high, outside support is needed.

#### Land and purchasing power make the DoD a unique customer – reduces costs and leads to commercialization

Fitzpatrick et al 11 (Ryan, Senior Policy Advisor for Clean Energy at Third Way, Josh Freed, Vice President for Clean Energy at Third Way, Mieke Eoyang, Director for National Security at Third Way, "Fighting for Innovation: How DoD Can Advance Clean Energy Technology... And Why It Has To," Jun, [content.thirdway.org/publications/414/Third\_Way\_Idea\_Brief\_-\_Fighting\_for\_Innovation.pdf], jam)

The DoD has over $400 billion in annual purchasing power, which means the Pentagon could provide a sizeable market for new technologies. This can increase a technology’s scale of production, bringing down costs, and making the product more likely to successfully reach commercial markets. Unfortunately, many potentially significant clean energy innovations never get to the marketplace, due to a lack of capital during the development and demonstration stages. As a result, technologies that could help the military meet its clean energy security and cost goals are being abandoned or co-opted by competetors like China before they are commercially viable here in the U.S. By focusing its purchasing power on innovative products that will help meet its energy goals, DoD can provide more secure and cost-effective energy to the military—producing tremendous long-term savings, while also bringing potentially revolutionary technologies to the public. Currently, many of these technologies are passed over during the procurement process because of higher upfront costs—even if these technologies can reduce life-cycle costs to DoD. The Department has only recently begun to consider life-cycle costs and the “fullyburdened cost of fuel” (FBCF) when making acquisition decisions. However, initial reports from within DoD suggest that the methodology for determining the actual FBCF needs to be refined and made more consistent before it can be successfully used in the acquisition process.32 The Department should fast-track this process to better maximize taxpayer dollars. Congressional appropriators— and the Congressional Budget Office—should also recognize the savings that can be achieved by procuring advanced technologies to promote DoD’s energy goals, even if these procurements come with higher upfront costs. Even if the Pentagon makes procurement of emerging clean energy technologies a higher priority, it still faces real roadblocks in developing relationships with the companies that make them. Many clean energy innovations are developed by small businesses or companies that have no previous experience working with military procurement officers. Conversely, many procurement officers do not know the clean energy sector and are not incentivized to develop relationships with emerging clean energy companies. Given the stakes in developing domestic technologies that would help reduce costs and improve mission success, the Pentagon should develop a program to encourage a better flow of information between procurement officers and clean energy companies—especially small businesses. Leverage Savings From Efficiency and Alternative Financing to Pay for Innovation. In an age of government-wide austerity and tight Pentagon budgets, current congressional appropriations are simply not sufficient to fund clean energy innovation. Until Congress decides to direct additional resources for this purpose, the Defense Department must leverage the money and other tools it already has to help develop clean energy. This can take two forms: repurposing money that was saved through energy efficiency programs for innovation and using alternative methods of financing to reduce the cost to the Pentagon of deploying clean energy. For several decades the military has made modest use alternative financing mechanisms to fund clean energy and efficiency projects when appropriated funds were insufficient. In a 2010 report, GAO found that while only 18% of renewable energy projects on DoD lands used alternative financing, these projects account for 86% of all renewable energy produced on the Department’s property.33 This indicates that alternative financing can be particularly helpful to DoD in terms of bringing larger and more expensive projects to fruition. One advanced financing tool available to DoD is the energy savings performance contract (ESPC). These agreements allow DoD to contract a private firm to make upgrades to a building or other facility that result in energy savings, reducing overall energy costs without appropriated funds. The firm finances the cost, maintenance and operation of these upgrades and recovers a profit over the life of the contract. While mobile applications consume 75% of the Department’s energy,34 DoD is only authorized to enter an ESPC for energy improvements done at stationary sites. As such, Congress should allow DoD to conduct pilot programs in which ESPCs are used to enhance mobile components like aircraft and vehicle engines. This could accelerate the needed replacement or updating of aging equipment and a significant reduction of energy with no upfront cost. To maximize the potential benefits of ESPCs, DoD should work with the Department of Energy to develop additional training and best practices to ensure that terms are carefully negotiated and provide benefits for the federal government throughout the term of the contract.35 This effort could possibly be achieved through the existing memorandum of understanding between these two departments.36 The Pentagon should also consider using any long-term savings realized by these contracts for other energy purposes, including the promotion of innovative technologies to further reduce demand or increase general energy security. In addition to ESPCs, the Pentagon also can enter into extended agreements with utilities to use DoD land to generate electricity, or for the long-term purchase of energy. These innovative financing mechanisms, known respectively as enhanced use leases (EULs) and power purchase agreements (PPAs), provide a valuable degree of certainty to third party generators. In exchange, the Department can leverage its existing resources—either its land or its purchasing power—to negotiate lower electricity rates and dedicated sources of locallyproduced power with its utility partners. DoD has unique authority among federal agencies to enter extended 30-year PPAs, but only for geothermal energy projects and only with direct approval from the Secretary of Defense. Again, limiting incentives for clean energy generation to just geothermal power inhibits the tremendous potential of other clean energy sources to help meet DoD’s energy goals. Congress should consider opening this incentive up to other forms of clean energy generation, including the production of advanced fuels. Also, given procurement officials’ lack of familiarity with these extended agreements and the cumbersome nature of such a high-level approval process, the unique authority to enter into extended 30-year PPAs is very rarely used.37 DoD should provide officials with additional policy guidance for using extended PPAs and Congress should simplify the process by allowing the secretary of each service to approve these contracts. Congress should also investigate options for encouraging regulated utility markets to permit PPA use by DoD. Finally, when entering these agreements, the Department should make every effort to promote the use of innovative and fledgling technologies in the terms of its EULs and PPAs. CON C L U S ION The Defense Department is in a unique position to foster and deploy innovation in clean energy technologies. This has two enormous benefits for our military: it will make our troops and our facilities more secure and it will reduce the amount of money the Pentagon spends on energy, freeing it up for other mission critical needs. If the right steps are taken by Congress and the Pentagon, the military will be able to put its resources to work developing technologies that will lead to a stronger fighting force, a safer nation, and a critical emerging sector of the American economy. The Defense Department has helped give birth to technologies and new economic sectors dozens of times before. For its own sake and the sake of the economy, it should make clean energy innovation its newest priority.

#### Smart grid’s increase vulnerability exponentially

Mo et al 12 (Yilin Mo received the Bachelor of Engineering degree from Department of Automation, Tsinghua University, Beijing, China, in 2007. He is currently working towards the Ph.D. degree at the Electrical and Computer Engineering Department, Carnegie Mellon University, Tiffany Hyun-Jin Kim received the B.A. degree in computer science from University of California at Berkeley, Berkeley, in 2002 and the M.S. degree in computer science from Yale University, New Haven, CT, in 2004. She is currently working towards the Ph.D. degree at the Electrical and Computer Engineering Department, Carnegie Mellon University, Kenneth Brancik completed a rigorous one year program in systems analysis at the former Grumman Data Information Systems in 1984 and an intensive two year program at Columbia University in the analysis and design of information systems in 1997. He received the M.S. degree in management and systems from New York University (NYU), New York, in 2002 and the Ph.D. degree in computing from Pace University, Dona Dickinson received the B.A. degree in industrial psychology from California State University, Heejo Lee received the B.S., M.S., and Ph.D. degrees in computer science and engineering from POSTECH, Pohang, Korea, Adrian Perrig received the Ph.D. degree in computer science from Carnegie Mellon University, Bruno Sinopoli received the Dr. Eng. degree from the University of Padova, Padova, Italy, in 1998 and the M.S. and Ph.D. degrees in electrical engineering from the University of California at Berkeley, “Cyber–Physical Security of a Smart Grid Infrastructure” “Proceedings of the IEEE” January 2012, Vol. 100, No. 1)

A wide variety of motivations exist for launching an attack on the power grid, ranging from economic reasons (e.g., reducing electricity bills), to pranks, and all the way to terrorism (e.g., threatening people by controlling electricity and other life-critical resources). The emerging smart grid, while benefiting the benign participants (consumers, utility companies), also provides powerful tools for adversaries. The smart grid will reach every house and building, giving potential attackers easy access to some of the grid components. While incorporating information technology (IT) systems and networks, the smart grid will be exposed to a wide range of security threats [5]. Its large scale also makes it nearly impossible to guarantee security for every single subsystem. Furthermore, the smart grid will be not only large but also very complex. It needs to connect different systems and networks, from generation facilities and distribution equipment to intelligent end points and communication networks, which are possibly deregulated and owned by several entities. It can be expected that the heterogeneity, diversity, and complexity of smart grid components may introduce new vulnerabilities, in addition to the common ones in interconnected networks and stand-alone microgrids [3]. To make the situation even worse, the sophisticated control, estimation, and pricing algorithms incorporated in the grid may also create additional vulnerabilities. The first-ever control system malware called Stuxnet was found in July 2010. This malware, targeting vulnerable SCADA systems, raises new questions about power grid security [6]. SCADA systems are currently isolated, preventing external access. Malware, however, can spread using USB drives and can be specifically crafted to sabotage SCADA systems that control electric grids. Furthermore, increasingly interconnected smart grids will unfortunately provide external access which in turn can lead to compromise and infection of components.

#### Doesn’t solve regulatory confusion or cyberdefense

Sater 11 (Daniel, Research Fellow at Global Green USA’s Security and Sustainability Office, “Military Energy Security: Current Efforts and Future Solutions”, August, http://globalgreen.org/docs/publication-185-1.pdf)

Cybersecurity remains one of the leading challenges impeding the development of a smart grid. In January 2011, the GAO published a report on the progress being made on cybersecurity as it related to smart grids71. Unfortunately, the report did not specifically address microgrids. The GAO found six challenges, however, to the development of a smart grid. The DOD is nonetheless well suited to handle the challenges listed by the GAO and the confinement of microgrids to military installations should mitigate many cybersecurity risks. The challenges listed by the GAO and the advantages of military microgrids for cybersecurity appear below. Challenge 1: Aspects of the regulatory environment may make it difficult to ensure smart grid systems’ cybersecurity. The federal government and state governments regulate electricity production and distribution. Having multiple entities produce regulations can lead to conflicting rules and thus confusion. Microgrids on military installations should avoid many of the regulatory issues the GAO found with the smart grid. The confinement of microgrids to military bases means that only the DOD will have regulatory control over them. There is precedent for states to exempt military installations from state regulations. According to a different GAO report, states often excluded military installations from their renewable energy-production goals.72 Furthermore, it is unlikely that any state government would want to get into the politically untenable battle with the Pentagon over issuing competing regulations governing military bases. Challenge 2: Utilities are focusing on regulatory compliance instead of comprehensive security. Microgrid cybersecurity will benefit from having the same entity, the DOD, issue the microgrid regulations and own the microgrids. Utilities have little incentive to invest in security measures past the bare minimum necessary for regulatory compliance. However, unlike a utility, the DOD will suffer in the event of a cybersecurity failure and thus has incentives to pursue comprehensive security. Challenge 3: The electric industry does not have an effective mechanism for sharing information on cybersecurity. Different utility companies across different states do not have a central authority analogous to that which military bases have in the Pentagon. Though there will certainly be bureaucracy, the DOD has more capacity to share information about cybersecurity and cyber-attacks than utilities. Challenge 4: Consumers are not adequately informed about the benefits, costs, and risks associated with smart grid systems. The DOD can take steps to inform all of its employees about microgrids in ways that may not be available to utilities to inform their customers. The DOD could require short classes on the benefits and risks of microgrids for all its employees and more rigorous education for its base commanders and others making decisions about grid implementation. A utility company cannot require its customers to take a class. A utility’s best option for educating its customers would be to send out information packets with monthly bills and hope that consumers read them. Challenge 5: There is a lack of security features being built into certain smart grid systems. Given the importance of the DOD’s mission and the potentially catastrophic repercussions of lax cybersecurity, the Pentagon will not take the security of its microgrids lightly, especially with the recent publication of the “Department of Defense Strategy for Operating in Cyberspace.”73 Challenge 6: The electricity industry does not have metrics for evaluating cybersecurity. The lack of evaluation metrics is a serious problem, but the DOD could instruct USCYBERCOM to create a specific set of metrics for microgrid development.

#### Empirics

Andres and Breetz 11 Richard Andres, Professor of National Security Strategy at the National War College and a Senior Fellow and Energy and Environmental Security and Policy Chair in the Center for Strategic Research, Institute for National Strategic Studies, at the National Defense University, and Hanna Breetz, doctoral candidate in the Department of Political Science at The Massachusetts Institute of Technology, Small Nuclear Reactorsfor Military Installations:Capabilities, Costs, andTechnological Implications, [www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf](http://www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf)

In recent years, the U.S. Department of Defense (DOD) has become increasingly interested in the potential of small (less than 300 megawatts electric [MWe]) nuclear reactors for military use.1 DOD’s attention to small reactors stems mainly from two critical vulnerabilities it has identified in its infrastructure and operations: the dependence of U.S. military bases on the fragile civilian electrical grid, and the challenge of safely and reliably supplying energy to troops in forward operating locations. DOD has responded to these challenges with an array of initiatives on energy efficiency and renewable and alternative fuels. Unfortunately, even with massive investment and ingenuity, these initiatives will be insufficient to solve DOD’s reliance on the civilian grid or its need for convoys in forward areas. The purpose of this paper is to explore the prospects for addressing these critical vulnerabilities through small-scale nuclear plants.

#### Intermittency and land

Loudermilk 11 Micah J. Loudermilk, Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University, 5/31/11, Small Nuclear Reactors and US Energy Security: Concepts, Capabilities, and Costs, www.ensec.org/index.php?option=com\_content&view=article&id=314:small-nuclear-reactors-and-us-energy-security-concepts-capabilities-and-costs&catid=116:content0411&Itemid=375

When discussing the energy security contributions offered by small nuclear reactors, it is not enough to simply compare them with existing nuclear technology, but also to examine how they measure up against other electricity generation alternatives—renewable energy technologies and fossil fuels. Coal, natural gas, and oil currently account for 45%, 23% and 1% respectively of US electricity generation sources. Hydroelectric power accounts for 7%, and other renewable power sources for 4%. These ratios are critical to remember because idealistic visions of providing for US energy security are not as useful as realistic ones balancing the role played by fossil fuels, nuclear power, and renewable energy sources. Limitations of renewables Renewable energy technologies have made great strides forward during the last decade. In an increasingly carbon emissions and greenhouse gas (GHG) aware global commons, the appeal of solar, wind, and other alternative energy sources is strong, and many countries are moving to increase their renewable electricity generation. However, despite massive expansion on this front, renewable sources struggle to keep pace with increasing demand, to say nothing of decreasing the amount of energy obtained from other sources. The continual problem with solar and wind power is that, lacking efficient energy storage mechanisms, it is difficult to contribute to baseload power demands. Due to the intermittent nature of their energy production, which often does not line up with peak demand usage, electricity grids can only handle a limited amount of renewable energy sources—a situation which Germany is now encountering. Simply put, nuclear power provides virtually carbon-free baseload power generation, and renewable options are unable to replicate this, especially not on the scale required by expanding global energy demands. Small nuclear reactors, however, like renewable sources, can provide enhanced, distributed, and localized power generation. As the US moves towards embracing smart grid technologies, power production at this level becomes a critical piece of the puzzle. Especially since renewable sources, due to sprawl, are of limited utility near crowded population centers, small reactors may in fact prove instrumental to enabling the smart grid to become a reality.

#### This is especially true in the context of SPIDERS

Ackerman 12 (Robert, editor in chief of SIGNAL Magazine for more than a dozen years, "Military Energy Enters SPIDERS Web," Feb, [www.afcea.org/content/?q=node/2877])

The SPIDERS cyber component will be a vital element, as it must ensure protection that resides on the network. Smart grids tend to rely heavily on wireless technology, so security will play a significant role in the network’s operation. Ka’iliwai emphasizes that SPIDERS still is evaluating to what extent wireless communication will be required for smart microgrids on military installations. Overall, the technology readiness levels of individual SPIDERS components are relatively high and close to being fieldable capabilities, Ka’iliwai says. The challenge is in trying to integrate them into the smart grid. Johnson says that the system-of-systems integration of SPIDERS is its biggest challenge. The presence of power systems and control systems is complicated by adding the network communications and cybersecurity requirements. Bringing together all of the necessary expertise is a key to success, especially because incorporating any element into the architecture affects the others. Large power grids provide stability as a characteristic of their design and size. That stability does not automatically apply for a microgrid, Johnson points out. Microgrid stability must be ensured by a control system that balances power coming from multiple sources. SPIDERS is implementing control over nontraditional systems such as electrical loads, she continues. The system must manage both power supply and the load on the microgrid. Optimizing controls will govern the power provided by generators according to generator and technology efficiency—whether solar panels should be providing a large portion of the power, or whether a windy day can increase dependence on windmills, for example.

### Tech Optimism K

#### Public debate solves fear-mongering—rejecting predictions cedes the political to technocratic planning

Kurasawa 4 – Prof Sociology, York (Fuyuki, Cautionary Tales, Constellations 11.4)

State and market institutions may seek to produce a culture of fear by deliberately stretching interpretations of reality beyond the limits of the plausible so as to exaggerate the prospects of impending catastrophes, or yet again, by intentionally promoting certain prognoses over others for instrumental purposes. Accordingly, regressive dystopias can operate as Trojan horses advancing political agendas or commercial interests that would otherwise be susceptible to public scrutiny and opposition. Instances of this kind of manipulation of the dystopian imaginary are plentiful: the invasion of Iraq in the name of fighting terrorism and an imminent threat of use of ‘weapons of mass destruction’; the severe curtailing of American civil liberties amidst fears of a collapse of ‘homeland security’; the neoliberal dismantling of the welfare state as the only remedy for an ideologically constructed fiscal crisis; the conservative expansion of policing and incarceration due to supposedly spiraling crime waves; and so forth. Alarmism constructs and codes the future in particular ways, producing or reinforcing certain crisis narratives, belief structures, and rhetorical conventions. As much as alarmist ideas beget a culture of fear, the reverse is no less true. If fear-mongering is a misappropriation of preventive foresight, resignation about the future represents a problematic outgrowth of the popular acknowledgment of global perils. Some believe that the world to come is so uncertain and dangerous that we should not attempt to modify the course of history; the future will look after itself for better or worse, regardless of what we do or wish. One version of this argument consists in a complacent optimism perceiving the future as fated to be better than either the past or the present. Frequently accompanying it is a self-deluding denial of what is plausible (‘the world will not be so bad after all’), or a naively Panglossian pragmatism (‘things will work themselves out in spite of everything, because humankind always finds ways to survive’).37 Much more common, however, is the opposite reaction, a fatalistic pessimism reconciled to the idea that the future will be necessarily worse than what preceded it. This is sustained by a tragic chronological framework according to which humanity is doomed to decay, or a cyclical one of the endless repetition of the mistakes of the past. On top of their dubious assessments of what is to come, alarmism and resignation would, if widely accepted, undermine a viable practice of farsightedness. Indeed, both of them encourage public disengagement from deliberation about scenarios for the future, a process that appears to be dangerous, pointless, or unnecessary. The resulting ‘depublicization’ of debate leaves dominant groups and institutions (the state, the market, techno-science) in charge of sorting out the future for the rest of us, thus effectively producing a heteronomous social order. How, then, can we support a democratic process of prevention from below? The answer, I think, lies in cultivating the public capacity for critical judgment and deliberation, so that participants in global civil society subject all claims about potential catastrophes to examination, evaluation, and contestation.

#### The aff’s approach to nuclear power is good --- we account for the history of nuclear power and are key to understand nukespeak as their Cully link evidence references

Ted Nordhaus 11, chairman – Breakthrough Instiute, and Michael Shellenberger, president – Breakthrough Institute, MA cultural anthropology – University of California, Santa Cruz, 2-25, <http://thebreakthrough.org/archive/the_long_death_of_environmenta>)

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

#### Individual level strategies fail and make global violence inevitable

Monbiot ‘4 George Monbiot, journalist, academic, and political and environmental activist, 2004, Manifesto for a New World Order, p. 11-13

The quest for global solutions is difficult and divisive. Some members of this movement are deeply suspicious of all institutional power at the global level, fearing that it could never be held to account by the world’s people. Others are concerned that a single set of universal prescriptions would threaten the diversity of dissent. A smaller faction has argued that all political programmes are oppressive: our task should not be to replace one form of power with another, but to replace all power with a magical essence called ‘anti-power’. But most of the members of this movement are coming to recognize that if we propose solutions which can be effected only at the local or the national level, we remove ourselves from any meaningful role in solving precisely those problems which most concern us. Issues such as cli­mate change, international debt, nuclear proliferation, war, peace and the balance of trade between nations can be addressed only globally or internationally. Without global measures and global institutions, it is impossible to see how we might distribute wealth from rich nations to poor ones, tax the mobile rich and their even more mobile money, control the shipment of toxic waste, sustain the ban on landmines, prevent the use of nuclear weapons, broker peace between nations or prevent powerful states from forcing weaker ones to trade on their terms. If we were to work only at the local level, we would leave these, the most critical of issues, for other people to tackle. Global governance will take place whether we participate in it or not. Indeed, it must take place if the issues which concern us are not to be resolved by the brute force of the powerful. That the international institutions have been designed or captured by the dictatorship of vested interests is not an argument against the existence of international institutions, but a reason for overthrowing them and re­placing them with our own. It is an argument for a global political system which holds power to account. In the absence of an effective global politics, moreover, local solutions will always be undermined by communities of interest which do not share our vision. We might, for example, manage to persuade the people of the street in which we live to give up their cars in the hope of preventing climate change, but unless everyone, in all communities, either shares our politics or is bound by the same rules, we simply open new road space into which the neighbouring communities can expand. We might declare our neighbour­hood nuclear-free, but unless we are simultaneously work­ing, at the international level, for the abandonment of nuclear weapons, we can do nothing to prevent ourselves and everyone else from being threatened by people who are not as nice as we are. We would deprive ourselves, in other words, of the power of restraint. By first rebuilding the global politics, we establish the political space in which our local alternatives can flourish. If, by contrast, we were to leave the governance of the necessary global institutions to others, then those institutions will pick off our local, even our national, solutions one by one. There is little point in devising an alternative economic policy for your nation, as Luis Inacio ‘Lula’ da Silva, now president of Brazil, once advocated, if the International Monetary Fund and the financial speculators have not first been overthrown. There is little point in fighting to protect a coral reef from local pollution, if nothing has been done to prevent climate change from destroying the conditions it requires for its survival.

#### The K of technology misses the boat—the segregation of “nature” from “machine” is anthropocentric metaphysics

Haraway 91—Donna Haraway [Awesome philosopher with a PhD in biology], "A Cyborg Manifesto Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in Simians, Cyborgs and Women: The Reinvention of Nature (New York; Routledge, 1991), pp.149-181. <http://www.egs.edu/faculty/haraway/haraway-a-cyborg-manifesto.html>

The second leaky distinction is between animal-human (organism) and machine. Pre-cybernetic machines could be haunted; there was always the spectre of the ghost in the machine. This dualism structured the dialogue between materialism and idealism that was settled by a dialectical progeny, called spirit or history, according to taste. But basically machines were not self-moving, self-designing, autonomous. They could not achieve man's dream, only mock it. They were not man, an author to himself, but only a caricature of that masculinist reproductive dream. To think they were otherwise was paranoid. Now we are not so sure. Late twentieth-century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert.

## 1AR

### NNSA DA

#### No war—economic globalization

Xuetong and Haixia ’12 Yan Xuetong, Dean of the Institute of Modern International Relations at Tsinghua University and the Chief Editor of The Chinese Journal of International Politics, he has his own Wikipedia page, Qi Haixia, Lecturer Ph.D in the Institute of International Studies , Tsinghua University, “Football Game Rather Than Boxing Match: China–US Intensifying Rivalry Does not Amount to Cold War,” Chinese Journal of International Politics 5(2): 105-127, Summer 2012, 10.1093/cjip/pos007

Economic globalization created a strategic need for superficial friendship between China and the United States. While scholars disagree over exactly when economic globalization began, all agree that it sped up after the end of the Cold War. This is because the Council for Mutual Economic Assistance ended after the collapse of the Soviet Union, resulting in a global market. Meanwhile, the pace of information-flow increased among states, shrinking the size of the globe and leading to popularization of the expression ‘global village’. Levels of interdependence have increased along with the growing proximity of international economic relations. That a strategy of complete confrontation can no longer effectively protect national interests is now obvious. It is for this reason that certain scholars argue that there has been a qualitative change in the nature of the security dilemma since end of the Cold War.35 Under the conditions of globalization, interdependence between China and the United States has continued to grow, and for the sake of economic interests, neither is willing to adopt a strategy of all-out confrontation. Economic interdependence, however, will not diffuse the political and security conflicts between the two states. Different interests in different spheres have thus created a foundation for superficial friendship between the United States and China.

#### Can’t be deterred—no return address and radicalism overwhelms rationality

Michael ’12 George Michael, associate professor of political science and administration of justice at The University of Virginia’s College at Wise, PhD in public policy from GMU, “Strategic Nuclear Terrorism and the Risk of State Decapitation,” Defence Studies, Vol. 12, Issue 1, 2012, T&F

During the Cold War, the nuclear balance of terror was thought to follow a certain train of logic, as both the United States and the Soviet Union pursued their foreign policy goals in a rational manner and were loath to risk nuclear annihilation in the form of mutually assured destruction. Some observers fear, though, that nuclear-armed extremist groups would not follow this logic because of their radical worldviews. 6 Moreover, inasmuch as terrorists usually have no return address or fixed assets, classic deterrence theory would be less applicable. 7 As Thomas C. Schelling once explained, deterring nuclear terrorists would be challenging: [A]n organization that needs only a small boat to dock in a metropolitan harbor, with a nuclear weapon on board and someplace to operate a two-way radio, can hardly be starved into second thoughts of denial of soybeans, military spare parts, or air traffic, and it evidently cannot be invaded or captured or we wouldn’t have the problem in the first place. 8 A nuclear first strike launched against the United States by way of intercontinental ballistic missiles would almost assuredly occasion a massive retaliatory strike against the culprit, as the attack, though swift, would not come as a complete surprise insofar as satellites would detect the launch well before the weapons reached their intended targets. By contrast, terrorists would not deliver a nuclear weapon by aircraft or missile, but by a truck or a freighter, thus the attack could come as a complete surprise. 9 Moreover, the time necessary to attribute the attack to the responsible party would rule out a quick retaliatory response. The tremendous potential damage that could be wreaked by a nuclear attack is so great that it could bring about the goals of a revolutionary group. The Bolshevik strategist Vladimir Lenin once reproached his fellow revolutionaries for their childlike assumption that the right bomb in the right place at the right time would bring about the worldwide communist revolution. 10 However, the enormous destructive capacity of a nuclear weapon might make such a far-flung fantasy more plausible. Under certain circumstances, the potential payoff from a nuclear attack could be so great that a terrorist group would undertake the effort. Specifically, an attack on a capital city could decapitate the central government, and by doing so, allow a terrorist organization to achieve its objectives. Even in the United States, with a massive homeland security apparatus, the country could still be at risk of state decapitation as a result of nuclear terrorism. The prospect of using nuclear terrorism to decapitate the government could be seen as an attractive alternative to extremist and terrorist groups that have virtually no hope of achieving their objectives through conventional political means.

#### Multiple SMRs now

Nuclear Street News ’12 “Savannah River Announces Agreements With Small Modular Reactor Developers,” 3/5/2012, http://nuclearstreet.com/nuclear\_power\_industry\_news/b/nuclear\_power\_news/archive/2012/03/05/savannah-river-announces-agreements-with-small-modular-reactor-developers-030502.aspx

The Department of Energy announced agreements Friday that could allow three companies to site prototype small modular reactors at the Savannah River National Laboratory in South Carolina. The agreements are tentative steps to allow Hyperion Power Generation, Holtec International and NuScale Power to explore land use and site services agreements with SRS. The memoranda of agreement allow the firms access to SRS information, facilities and technical expertise in an effort to help them develop their respective SMR designs. “The Obama administration continues to believe that low-carbon nuclear energy has an important role to play in America’s energy future,” Energy Secretary Stephen Chu said in a release. “We are committed to restarting the nation’s nuclear industry and advancing the next generation of these technologies, helping to create new jobs and export opportunities for American workers and businesses.” The agreements are separate from federal funding the energy department has proposed for SMR research. In January, DOE began taking comments on a proposed five-year, $452 million grant program for SMR research. The final Funding Opportunity Announcement is expected this spring, with an industry day/pre-bidders’ conference scheduled tentatively for April. Any long-term projects would be dependent on year-to-year funding from Congress and the White House. Although DOE remains committed to SMRs, proposing $65 million to support their development in the fiscal year 2013 budget.

### Immigration DA

#### AT: India relations

Gabriel Kolko, Excerpt from Another Century of War, January 3, 2008, http://www.antiwar.com/orig/kolko.php?articleid=12148

The frightening Pakistan-India confrontation revealed that the US' actions have destabilized the entire precarious South Asian geopolitical balance, and this is of far greater consequence over the longer term than what happens in Afghanistan. Pakistan has lost what it terms "strategic depth" in Afghanistan, leaving it more than ever vulnerable to Indian demands that Pakistan end its claims on Indian-controlled Kashmir and cease supporting guerrillas there. Washington officials sought to court both Pakistan and India, and the Indians correctly pointed out that the Taliban regime and al-Qaeda trained many of the separatist guerrillas in Indian-held Kashmir; over half of those killed there since 2000 are of foreign nationality – mainly Pakistanis but also Arabs, some of whom gained experience while fighting Soviet troops. Pakistan became the principal source of support for these guerrillas after 1990; it calls them freedom fighters, but many are Islamic extremists recruited by pro-Taliban Islamic groups in Pakistan and now largely controlled by a branch of Pakistan's intelligence. No one, Musharraf made it clear in his ostensible peace overture to India at the beginning of this year, would be handed over to foreign authorities, including those involved in the attack on India's parliament. But he closed training camps for Kashmir guerrillas in Pakistan at the beginning of this year to placate India, outlawed five "extremist" organizations supporting them, detained over 1,400 people, and said he would impose controls over the Islamic schools which are the hotbed from which the Taliban emerged. These organizations trained at least 5,000 men and they are likely to go underground, becoming potentially even more dangerous. That they represent a relatively small minority is less consequential than their determination. India is interested in deeds, not words, and certainly did not demobilize the vast armies it stationed on Pakistan's borders. By breaking with Islamic extremists, as India and Washington demands he do as part of the war on terrorism, Musharraf also risks undermining his Kashmir policy and the support of the military.