### Districts aff cards

# Rd 1 vs Idaho State Doty/Hoth

## 1AC

### Advantage

#### Our world is composed of a complex assortment of interacting force-fields, each following their own rules and working to their own tempo, continually being driven by their interactions and contradictions with other fields. A human is just one small piece in a play of forces involving solar energy, tectonic plate shifts, ocean currents, asteroid showers, earthquakes, volcanos, species evolutions and extinctions, rainstorms, tornadoes, and hurricanes.

#### Unfortunately, this world is in jeopardy. Anthropogenic climate change poses an unmistakable danger to life of all kinds on Earth. At stake are the very life cycle processes relied upon by humans and nonhumans alike.

Hannah ’12 Lee Hannah, senior researcher in climate change biology at Conservation International, visiting researcher and adjunct professor at the Bren School of Environmental Science & Management at UC-Santa Barbara, has a pretty detailed Wikipedia page, “As Threats to Biodiversity Grow, Can We Save World’s Species?” Yale Environment 360, 4/19/2012, http://e360.yale.edu/feature/as\_threats\_to\_biodiversity\_grow\_can\_we\_save\_worlds\_species/2518/

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

#### Climate change also affects humans unequally. Regions responsible for the least GHG emissions will be at the greatest disadvantage. Sea level rise puts the hundreds of millions of people living on coastal and low-lying regions at risk, while climate shifts magnify food and water shortages. Entire islands are sinking. Action is key.

Byravan and Rajan ’10 Sujatha Byravan and Sudhir Chella Rajan, “The Ethical Implications of Sea-Level Rise Due to Climate Change,” Ethics & International Affairs 24, No. 3, 9/20/2010, only accessible on some exclusive database

As scientific evidence for the adverse effects of human-induced climate change grows stronger, it is becoming increasingly clear that these questions are of urgent practical interest and require concerted international political action. In the course of this century and the next, the earth’s climate will almost surely get warmer as a direct result of the emissions accumulated in the atmosphere from the burning of fossil fuels since the Industrial Revolution. This warming will very likely result in heat waves, heavy precipitation in some areas, extreme droughts in others, increased hurricane intensity, and sea-level rise of about one meter—although recent findings suggest this rise could quite plausibly be greater than that by century’s end.1 Forecasts of how many people will be displaced by 2050 by climate change vary widely, from about 25 million to 1 billion. The difficulty in accurate forecasting lies not only in the uncertainty regarding future climate change impacts and adaptation measures but also in estimating the outcome of the several complex factors driving migration.2 No other form of environmentally induced human migration will likely be as permanent as that caused by climate-induced SLR; and there are special reasons why its victims deserve unique moral consideration. SLR will affect coastal populations in a variety of ways, including inundation, flood and storm damage, erosion, saltwater intrusion, and wetland loss. Together, these will greatly reduce available land for cultivation, water resources, and fodder, causing severe hardship in terms of livelihood and habitat loss. Worst of all, SLR and the associated changes in the coastal zone will add burdens to many who are already poor and vulnerable. The physical changes associated with SLR may themselves take place in abrupt, nonlinear ways as thresholds are crossed. In turn, the least resilient communities— that is, those dependent on subsistence fishing—will be the first to experience ‘‘tipping points’’ in their life systems, so that the only option available to them would be to abandon their homes and search for better prospects elsewhere. As the average sea level continues to rise, coastal inundation, saltwater intrusion, and storm surges will become more intense and people will find it increasingly difficult to stay in their homes and will look for ways to migrate inland. As ever larger numbers pass thresholds in their ability to cope, more societal tipping points will be crossed, resulting in the sudden mass movements of entire villages, towns, and cities in coastal regions.3 On small islands and in countries with heavily populated delta regions, the very existence of the nation-state may become jeopardized, so that the extremely vulnerable will no longer have state protection they can rely on. The extent of vulnerability to sea-level rise in any given country will depend on more than just its terrain and climatic conditions: the fraction of the population living in low-lying regions, the area and proportion of the country inundated, its wealth and economic conditions, and its prevailing political institutions and infrastructure will all be of relevance. Thus, in a large country, such as the United States or China, coastal communities would be able to move inland, given adequate preparation and government response. In the case of small islands in the South Pacific, however, such an option does not exist, since it is expected that most or even the entire land area will sink or become uninhabitable. In such cases as Bangladesh, Egypt, Guyana, and Vietnam, where nearly half or more of the populations live in low-lying deltaic regions that support a major fraction of their economies, SLR will threaten the very functioning of the state. Moreover, it is increasingly clear that for tens to hundreds of millions of people living in low-lying areas and on small islands, no physical defense is realistically possible or can be fully protective. A recent report by the Dutch Delta Committee proposes annual investments of about 1.5 billion Euros for the rest of the century just to protect the Netherlands’ 200-mile coastline, and indicates that 20–50 percent of coastal land worldwide cannot be protected, especially under conditions where SLR takes place rapidly—as a result, say, of a collapse of major ice sheets in Greenland or Antarctica.4 Even if greenhouse gases are removed from the atmosphere through some future technology, we are already committed to a certain degree of warming and sea-level rise because of the thermal inertia of the oceans. In addition, most residents of small island nations and other low-lying coastal regions around the world will not be able to avail themselves of the sorts of conventional adaptation remedies that are conceivable for the victims of drought, reduced crop yields, desertification, and so on. Apart from exceptional cases where adequate engineering solutions can be developed to prevent inundation, coastal erosion, saltwater intrusion, and other challenges associated with rising seas, people living in these vulnerable regions will be forced to flee, generally with no possibility of return to their original homes. Indeed, migration and permanent resettlement will be the only possible ‘‘adaptation’’ strategy available to millions. Existing international law provides no solution for these individuals, for whom, we will argue, the only just remedy is in the form of special rights of free global movement and resettlement in regions and countries on higher ground in advance of disaster.

#### Global warming is a crisis point for the coordinates of contemporary critique. For much of the 20th century, theory tasked itself with breaking down totalizing regimes of ‘truth’ and ‘certainty’—but as these deconstructive practices have lost their critical spirit, our tools have fallen into the hands of political conservatives. A New York Times article relates the following:

(This paragraph is taken from the middle of the evidence cited below)

In these most depressing of times, these are some of the issues I want to press, not to depress the reader but to press ahead, to redirect our meager capacities as fast as possible. To prove my point, I have, not exactly facts, but rather tiny cues, nagging doubts, disturbing telltale signs. What has become of critique, I wonder, when an editorial in the New York Times contains the following quote? Most scientists believe that [global] warming is caused largely by manmade pollutants that require strict regulation. Mr. Luntz [a Republican strategist] seems to acknowledge as much when he says that “the scientiﬁc debate is closing against us.” His advice, however, is to emphasize that the evidence is not complete. “Should the public come to believe that the scientiﬁc issues are settled,” he writes, “their views about global warming will change accordingly. Therefore, you need to continue to make the lack of scientiﬁc certainty a primary issue.” 2

#### Critical thinkers must take notice: the ‘science wars’ are over—now the left’s arguments are fighting the right’s battles. It’s time for critique to change. We must challenge the socioeconomic forces behind rampant fossil fuel emissions directly.

Latour ‘4 Bruno Latour, Professor and vice-president for research at Sciences Po Paris, “Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern,” Critical Inquiry 30, Winter 2004

Wars. So many wars. Wars outside and wars inside. Cultural wars, science wars, and wars against terrorism. Wars against poverty and wars against the poor. Wars against ignorance and wars out of ignorance. My question is simple: Should we be at war, too, we, the scholars, the intellectuals? Is it really our duty to add fresh ruins to ﬁelds of ruins? Is it really the task of the humanities to add deconstruction to destruction? More iconoclasm to iconoclasm? What has become of the critical spirit? Has it run out of steam? Quite simply, my worry is that it might not be aiming at the right target. To remain in the metaphorical atmosphere of the time, military experts constantly revise their strategic doctrines, their contingency plans, the size, direction, and technology of their projectiles, their smart bombs, their missiles; I wonder why we, we alone, would be saved from those sorts of revisions. It does not seem to me that we have been as quick, in academia, to prepare ourselves for new threats, new dangers, new tasks, new targets. Are we not like those mechanical toys that endlessly make the same gesture when everything else has changed around them? Would it not be rather terrible if we were still training young kids—yes, young recruits, young cadets—for wars that are no longer possible, ﬁghting enemies long gone, conquering territories that no longer exist, leaving them ill-equipped in the face of threats we had not anticipated, for which we are so thoroughly unprepared? Generals have always been accused of being on the ready one war late— especially French generals, especially these days. Would it be so surprising, after all, if intellectuals were also one war late, one critique late—especially French intellectuals, especially now? It has been a long time, after all, since intellectuals were in the vanguard. Indeed, it has been a long time since the very notion of the avant-garde—the proletariat, the artistic—passed away, pushed aside by other forces, moved to the rear guard, or maybe lumped with the baggage train. 1 We are still able to go through the motions of a critical avant-garde, but is not the spirit gone? In these most depressing of times, these are some of the issues I want to press, not to depress the reader but to press ahead, to redirect our meager capacities as fast as possible. To prove my point, I have, not exactly facts, but rather tiny cues, nagging doubts, disturbing telltale signs. What has become of critique, I wonder, when an editorial in the New York Times contains the following quote? Most scientists believe that [global] warming is caused largely by manmade pollutants that require strict regulation. Mr. Luntz [a Republican strategist] seems to acknowledge as much when he says that “the scientiﬁc debate is closing against us.” His advice, however, is to emphasize that the evidence is not complete. “Should the public come to believe that the scientiﬁc issues are settled,” he writes, “their views about global warming will change accordingly. Therefore, you need to continue to make the lack of scientiﬁc certainty a primary issue.” 2 Fancy that? An artiﬁcially maintained scientiﬁc controversy to favor a “brownlash,” as Paul and Anne Ehrlich would say. 3 Do you see why I am worried? I myself have spent some time in the past trying to show “‘the lack of scientiﬁc certainty’” inherent in the construction of facts. I too made it a “‘primary issue.’” But I did not exactly aim at fooling the public by obscuring the certainty of a closed argument—or did I? After all, I have been accused of just that sin. Still, I’d like to believe that, on the contrary, I intended to emancipate the public from prematurely naturalized objectiﬁed facts. Was I foolishly mistaken? Have things changed so fast? In which case the danger would no longer be coming from an excessive conﬁdence in ideological arguments posturing as matters of fact—as we have learned to combat so eﬃciently in the past—but from an excessive distrust of good matters of fact disguised as bad ideological biases! While we spent years trying to detect the real prejudices hidden behind the appearance of objective statements, do we now have to reveal the real objective and incontrovertible facts hidden behind the illusion of prejudices? And yet entire Ph.D. programs are still running to make sure that good American kids are learning the hard way that facts are made up, that there is no such thing as natural, unmediated, unbiased access to truth, that we are always prisoners of language, that we always speak from a particular standpoint, and so on, while dangerous extremists are using the very same argument of social construction to destroy hard-won evidence that could save our lives. Was I wrong to participate in the invention of this ﬁeld known as science studies? Is it enough to say that we did not really mean what we said? Why does it burn my tongue to say that global warming is a fact whether you like it or not? Why can’t I simply say that the argument is closed for good? Should I reassure myself by simply saying that bad guys can use any weapon at hand, naturalized facts when it suits them and social construction when it suits them? Should we apologize for having been wrong all along? Or should we rather bring the sword of criticism to criticism itself and do a bit of soul-searching here: what were we really after when we were so intent on showing the social construction of scientiﬁc facts? Nothing guarantees, after all, that we should be right all the time. There is no sure ground even for criticism. 4 Isn’t this what criticism intended to say: that there is no sure ground anywhere? But what does it mean when this lack of sure ground is taken away from us by the worst possible fellows as an argument against the things we cherish?

#### There are a variety of ways to respond to our energy and climate crises. In the 1950s, nuclear planners chose solid uranium/plutonium fuel cycle designs—these reactors, after all, produced plutonium that we could make nuclear bombs from. Unfortunately, safe and efficient liquid-fluoride thorium reactors were passed over, and have since been ignored.

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

What if we could turn back the clock to 1965 and have an energy do-over? In June of that year, the Molten Salt Reactor Experiment (MSRE) achieved criticality for the first time at Oak Ridge National Laboratory (ORNL) in Tennessee. In place of the familiar fuel rods of modern nuclear plants, the MSRE used liquid fuel - hot fluoride salt containing dissolved fissile material in a solution roughly the viscosity of water at operating temperature. The MSRE ran successfully for five years, opening a new window on nuclear technology. Then the window banged closed when the molten-salt research program was terminated. Knowing what we now know about climate change, peak oil, Three Mile Island, Chernobyl, and the Deepwater Horizon oil well gushing in the Gulf of Mexico in the summer of 2010, what if we could have taken a different energy path? Many feel that there is good reason to wish that the liquid-fuel MSRE had been allowed to mature. An increasingly popular vision of the future sees liquid-fuel reactors playing a central role in the energy economy, utilizing relatively abundant thorium instead of uranium, mass producible, free of carbon emissions, inherently safe and generating a trifling amount of waste. Of course we can't turn back the clock. Maddeningly to advocates of liquid-fuel thorium power, it is proving just as hard to simply restart the clock. Historical, technological and regulatory reasons conspire to make it hugely difficult to diverge from our current path of solid-fuel, uraniumbased plants. And yet an alternative future that includes liquid-fuel thorium-based power beckons enticingly. We'll review the history, technology, chemistry and economics of thorium power and weigh the pros and cons of thorium versus uranium. We'll conclude by asking the question we started with: What if? The Choice The idea of a liquid-fuel nuclear reactor is not new. Enrico Fermi, creator in 1942 of the first nuclear reactor in a pile of graphite and uranium blocks at the University of Chicago, started up the world's first liquid-fuel reactor two years later in 1944, using uranium sulfate fuel dissolved in water. In all nuclear chain reactions, fissile material absorbs a neutron, then fission of the atom releases tremendous energy and additional neutrons. The emitted neutrons, traveling at close to 10 percent of the speed of light, would be very unlikely to cause further fission in a reactor like Fermi's Chicago PiIe-I unless they were drastically slowed - moderated - to speeds of a few kilometers per second. In Fermi's device, the blocks of graphite between pellets of uranium fuel slowed the neutrons down. The control system for Fermi's reactor consisted of cadmium-coated rods that upon insertion would capture neutrons, quenching the chain reaction by reducing neutron generation. The same principles of neutron moderation and control of the chain reaction by regulation of the neutron economy continue to be central concepts of nuclear reactor design. In the era immediately following Fermi's breakthrough, a large variety of options needed to be explored. Alvin Weinberg, director of ORNL from 1955 to 1973, where he presided over one of the major research hubs during the development of nuclear power, describes the situation in his memoir, The First Nuclear Era: In the early days we explored all sorts of power reactors, comparing the advantages and disadvantages of each type. The number of possibilities was enormous, since there are many possibilities for each component of a reactor - fuel, coolant, moderator. The fissile material may be U-233, U-235, or Pu-239; the coolant may be: water, heavy water, gas, or liquid metal; the moderator may be: water, heavy water, beryllium, graphite - or, in a fast-neutron reactor, no moderator.... if one calculated all the combinations of fuel, coolant, and moderator, one could identify about a thousand distinct reactors. Thus, at the very beginning of nuclear power, we had to choose which possibilities to pursue, which to ignore. Among the many choices made, perhaps the most important choice for the future trajectory of nuclear power was decided by Admiral Hyman Rickover, the strong-willed Director of Naval Reactors. He decided that the first nuclear submarine, the LfSS Nautilus, would be powered by solid uranium oxide enriched in uranium-235, using water as coolant and moderator. The Nautilus took to sea successfully in 1955. Building on the momentum of research and spending for the Nautilus reactor, a reactor of similar design was installed at the Shippingport Atomic Power Station in Pennsylvania to become the first commercial nuclear power plant when it went online in 1957. Rickover could cite many reasons for choosing to power the Nautilus with the SlW reactor (SlW stands for submarine, 1st generation, Westinghouse). At the time it was the most suitable design for a submarine. It was the likeliest to be ready soonest. And the uranium fuel cycle offered as a byproduct plutonium-239, which was used for the development of thermonuclear ordnance. These reasons have marginal relevance today, but they were critical in defining the nuclear track we have been on ever since the 1950s. The down sides of Rickover 's choice remain with us as well. Solid uranium fuel has inherent challenges. The heat and radiation of the reactor core damage the fuel assemblies, one reason fuel rods are taken out of service after just a few years and after consuming only three to five percent of the energy in the uranium they contain. Buildup of fission products within the fuel rod also undermines the efficiency of the fuel, especially the accumulation of xenon-135, which has a spectacular appetite for neutrons, thus acting as a fission poison by disrupting the neutron economy of the chain reaction. Xenon135 is short-lived (half-life of 9.2 hours) but it figures importantly in the management of the reactor. For example, as it burns off, the elimination of xenon135 causes the chain reaction to accelerate, which requires control rods to be reinserted in a carefully managed cycle until the reactor is stabilized. Mismanagement of this procedure contributed to the instability in the Chernobyl core that led to a runaway reactor and the explosion that followed. Other byproducts of uranium fission include long-lived transuranic materials (elements above uranium in the periodic table), such as plutonium, americium, neptunium and curium. Disposal of these wastes of the uranium era is a problem that is yet to be resolved. Thorium When Fermi built Chicago PiIe-I, uranium was the obvious fuel choice: Uranium-235 was the only fissile material on Earth. Early on, however, it was understood that burning small amounts of uranium-235 in the presence of much larger amounts of uranium-238 in a nuclear reactor would generate transmuted products, including fissile isotopes such as plutonium-239. The pioneers of nuclear power (Weinberg in his memoir calls his cohorts "the old nukes") were transfixed by the vision of using uranium reactors to breed additional fuel in a cycle that would transform the world by delivering limitless, inexpensive energy. By the same alchemistry of transmutation, the nonfissile isotope thorium-232 (the only naturally occurring isotope of thorium) can be converted to fissile uranium-233. A thorium-based fuel cycle brings with it different chemistry, different technology and different problems. It also potentially solves many of the most intractable problems of the uranium fuel cycle that today produces 17 percent of the electric power generated worldwide and 20 percent of the power generated in the U.S. Thorium is present in the Earth's crust at about four times the amount of uranium and it is more easily extracted. When thorium-232 (atomic number 90) absorbs a neutron, the product, thorium-233, undergoes a series of two beta decays - in beta decay an electron is emitted and a neutron becomes a proton - forming uranium-233 (atomic number 91). Uranium-233 is fissile and is very well suited to serve as a reactor fuel. In fact, the advantages of the thorium /uranium fuel cycle compared to the uranium/plutonium cycle have mobilized a community of scientists and engineers who have resurrected the research of the Alvin Weinberg era and are attempting to get thorium-based power into the mainstream of research, policy and ultimately, production. Thorium power is sidelined at the moment in the national research laboratories of the U.S., but it is being pursued intensively in India, which has no uranium but massive thorium reserves. Perhaps the best known research center for thorium is the Reactor Physics Group of the Laboratoire de Physique Subatomique et de Cosmologie in Grenoble, France, which has ample resources to develop thorium power, although their commitment to a commercial thorium solution remains tentative. (French production of electricity from nuclear power, at 80 percent, is the highest in the world, based on a large infrastructure of traditional pressurized water plants and their own national fuel-reprocessing program for recycling uranium fuel.) The key to thorium-based power is detaching from the well-established picture of what a reactor should be. In a nutshell, the liquid fluoride thorium reactor (LFTR, pronounced "lifter") consists of a core and a "blanket," a volume that surrounds the core. The blanket contains a mixture of thorium tetrafluoride in a fluoride salt containing lithium and beryllium, made molten by the heat of the core. The core consists of fissile uranium-233 tetrafluoride also in molten fluoride salts of lithium and beryllium within a graphite structure that serves as a moderator and neutron reflector. The uranium-233 is produced in the blanket when neutrons generated in the core are absorbed by thorium-232 in the surrounding blanket. The thorium-233 that results then beta decays to short-lived protactinium-233, which rapidly beta decays again to fissile uranium-233. This fissile material is chemically separated from the blanket salt and transferred to the core to be burned up as fuel, generating heat through fission and neutrons that produce more uranium233 from thorium in the blanket. Advantages of Liquid Fuel Liquid fuel thorium reactors offer an array of advantages in design, operation, safety, waste management, cost and proliferation resistance over the traditional configuration of nuclear plants. Individually, the advantages are intriguing. Collectively they are compelling. Unlike solid nuclear fuel, liquid fluoride salts are impervious to radiation damage. We mentioned earlier that fuel rods acquire structural damage from the heat and radiation of the nuclear furnace. Replacing them requires expensive shutdown of the plant about every 18 months to swap out a third of the fuel rods while shuffling the remainder. Fresh fuel is not very hazardous, but spent fuel is intensely radioactive and must be handled by remotely operated equipment. After several years of storage underwater to allow highly radio- . active fission products to decay to stability, fuel rods can be safely transferred to dry-cask storage. Liquid fluoride fuel is not subject to the structural stresses of solid fuel and its ionic bonds can tolerate unlimited levels of radiation damage, while eUminating the (rather high) cost of fabricating fuel elements and the (also high) cost of periodic shutdowns to replace them. More important are the ways in which liquid fuel accommodates chemical engineering. Within uranium oxide fuel rods, numerous transuranic products are generated, such as plutonium-239, created by the absorption of a neutron by uranium-238, followed by beta decay. Some of this plutonium is fissioned, contributing as much as one-third of the energy production of uranium reactors. All such transuranic elements could eventually be destroyed in the neutron flux, either by direct fission or transmutation to a fissile element, except that the solid fuel must be removed long before complete burnup is achieved. In liquid fuel, transuranic fission products can remain in the fluid fuel of the core, transmuting by neutron absorption until eventually they nearly all undergo fission. In solid fuel rods, fission products are trapped in the structural lattice of the fuel material. In liquid fuel, reaction products can be relatively easily removed. For example, the gaseous fission poison xenon is easy to remove because it bubbles out of solution as the fuel salt is pumped. Separation of materials by this mechanism is central to the main feature of thorium power, which is formation of fissile uranium-233 in the blanket for export to the core. In the fluoride salt of the thorium blanket, newly formed uranium-233 forms soluble uranium tetrafluoride (UF4). Bubbling fluorine gas through the blanket solution converts the uranium tetrafluoride into gaseous uranium hexafluoride (UF6), while not chemically affecting the lessreactive thorium tetrafluoride. Uranium hexafluoride comes out of solution, is captured, then is reduced back to soluble UF4 by hydrogen gas in a reduction column, and finally is directed to the core to serve as fissile fuel. Other fission products such as molybdenum, neodymium and technetium can be easily removed from liquid fuel by fluorination or plating techniques, greatly prolonging the viability and efficiency of the liquid fuel. Liquid fluoride solutions are familiar chemistry. Millions of metric tons of liquid fluoride salts circulate through hundreds of aluminum chemical plants daily, and all uranium used in today's reactors has to pass in and out of a fluoride form in order to be enriched. The LFTR technology is in many ways a straightforward extension of contemporary nuclear chemical engineering. Waste Not Among the most attractive features of the LFTR design is its waste profile. It makes very little. Recently, the problem of nuclear waste generated during the uranium era has become both more and less urgent. It is more urgent because as of early 2009, the Obama administration has ruled that the Yucca Mountain Repository, the site designated for the permanent geological isolation of existing U.S. nuclear waste, is no longer to be considered an option. Without Yucca Mountain as a strategy for waste disposal, the U.S. has no strategy at all. In May 2009, Secretary of Energy Steven Chu, Nobel laureate in physics, said that Yucca Mountain is off the table. What we're going to be doing is saying, let's step back. We realize that we know a lot more today than we did 25 or 30 years ago. The [Nuclear Regulatory Commission] is saying that the dry-cask storage at current sites would be safe for many decades, so that gives us time to figure out what we should do for a long-term strategy. The waste problem has become somewhat less urgent because many stakeholders believe Secretary Chu is correct that the waste, secured in huge, hardened casks under adequate guard, is in fact not vulnerable to any foreseeable accident or mischief in the near future, buying time to develop a sound plan for its permanent disposal. A sound plan we must have. One component of a long-range plan that would keep the growing problem from getting worse while meeting growing power needs would be to mobilize nuclear technology that creates far less waste that is far less toxic. The liquid fluoride thorium reactor answers that need. Thorium and uranium reactors produce essentially the same fission (breakdown) products, but they produce a quite different spectrum of actinides (the elements above actinium in the periodic table, produced in reactors by neutron absorption and transmutation). The various isotopes of these elements are the main contributors to the very long-term radiotoxicity of nuclear waste. The mass number of thorium-232 is six units less than that of uranium238, thus many more neutron captures are required to transmute thorium to the first transuranic. Figure 6 shows that the radiotoxicity of wastes from a thorium /uranium fuel cycle is far lower than that of the currently employed uranium/plutonium cycle; after 300 years, it is about 10,000 times less toxic. By statute, the U.S. government has sole responsibility for the nuclear waste that has so far been produced and has collected $25 billion in fees from nuclear-power producers over the past 30 years to deal with it. Inaction on the waste front, to borrow the words of the Obama administration, is not an option. Many feel that some of the $25 billion collected so far would be well spent kickstarting research on thorium power to contribute to future power with minimal waste. Safety First It has always been the dream of reactor designers to produce plants with inherent safety - reactor assembly, fuel and power-generation components engineered in such a way that the reactor will, without human intervention, remain stable or shut itself down in response to any accident, electrical outage, abnormal change in load or other mishap. The LFTR design appears, in its present state of research and design, to possess an extremely high degree of inherent safety. The single most volatile aspect of current nuclear reactors is the pressurized water. In boiling light-water, pressurized light-water, and heavywater reactors (accounting for nearly all of the 441 reactors worldwide), water serves as the coolant and neutron moderator. The heat of fission causes water to boil, either directly in the core or in a steam generator, producing steam that drives a turbine. The water is maintained at high pressure to raise its boiling temperature. The explosive pressures involved are contained by a system of highly engineered, highly expensive piping and pressure vessels (called the "pressure boundary"), and the ultimate line of defense is the massive, expensive containment building surrounding the reactor, designed to withstand any explosive calamity and prevent the release of radioactive materials propelled by pressurized steam. A signature safety feature of the LFTR design is that the coolant - liquid fluoride salt - is not under pressure. The fluoride salt does not boil below 1400 degrees Celsius. Neutral pressure reduces the cost and the scale of LFTR plant construction by reducing the scale of the containment requirements, because it obviates the need to contain a pressure explosion. Disruption in a transport line would result in a leak, not an explosion, which would be captured in a noncritical configuration in a catch basin, where it would passively cool and harden. Another safety feature of LFTRs, shared with all of the new generation of LWRs, is its negative temperature coefficient of reactivity. Meltdown, the bogey of the early nuclear era, has been effectively designed out of modern nuclear fuels by engineering them so that power excursions - the industry term for runaway reactors - are self-limiting. For example, if the temperature in a reactor rises beyond the intended regime, signaling a power excursion, the fuel itself responds with thermal expansion, reducing the effective area for neutron absorption - the temperature coefficient of reactivity is negative - thus suppressing the rate of fission and causing the temperature to fall. With appropriate formulations and configurations of nuclear fuel, of which there are now a number from which to choose among solid fuels, runaway reactivity becomes implausible. In the LFTR, thermal expansion of the liquid fuel and the moderator vessel containing it reduces the reactivity of the core. This response permits the desirable property of load following - under conditions of changing electricity demand (load), the reactor requires no intervention to respond with automatic increases or decreases in power production. As a second tier of defense, LFTR designs have a freeze plug at the bottom of the core - a plug of salt, cooled by a fan to keep it at a temperature below the freezing point of the salt. If temperature rises beyond a critical point, the plug melts, and the liquid fuel in the core is immediately evacuated, pouring into a subcriticai geometry in a catch basin. This formidable safety tactic is only possible if the fuel is a liquid. One of the current requirements of the Nuclear Regulatory Commission (NRC) for certification of a new nuclear plant design is that in the event of a complete electricity outage, the reactor remain at least stable for several days if it is not automatically deactivated. As it happens, the freezeplug safety feature is as old as Alvin Weinberg's 1965 Molten Salt Reactor Experiment design, yet it meets the NRCs requirement; at ORNL, the "old nukes" would routinely shut down the reactor by simply cutting the power to the freeze-plug cooling system. This setup is the ultimate in safe poweroutage response. Power isn't needed to shut down the reactor, for example by manipulating control elements. Instead power is needed to prevent the shutdown of the reactor.

### Solvency

#### We affirm: The United States federal government should substantially increase market-fixed production cost incentives for Liquid Fluoride Thorium Small Modular Reactors.

#### Flexible incentives would prompt a thorium renaissance

Rosner and Goldberg ‘11 (Robert (William E. Wrather Distinguished Service Professor in the Departments of Astronomy and Astrophysics and Physics) and Stephen (Special Assistant to the Director at the Argonne National Laboratory) , *Energy Policy Institute at Chicago*, “Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.”, Technical Paper, Revision 1, November 2011)

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. 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, 􏰂 Based on a market price of $60/MWh44 (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). 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, 􏰂 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. 􏰂 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.

#### This would trigger key reductions in carbon emissions—that’s essential to slow and reverse anthropogenic climate change

Hargraves and Moir ’11 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 Fuel Nuclear Reactors,” Physics & Society, January 2011, http://www.aps.org/units/fps/newsletters/201101/hargraves.cfm

Burning coal for power is the largest source of atmospheric CO2, which drives global warming. We seek alternatives such as burying CO2 or substituting wind, solar, and nuclear power. A source of energy cheaper than coal would dissuade nations from burning coal while affording them a ready supply of electric power. Can a LFTR produce energy cheaper than is currently achievable by burning coal? Our target cost for energy cheaper than from coal is $0.03/kWh at a capital cost of $2/watt of generating capacity. Coal costs $40 per ton, contributing $0.02/kWh to electrical energy costs. Thorium is plentiful and inexpensive; one ton worth $300,000 can power a 1,000 megawatt LFTR for a year. Fuel costs for thorium would be only $0.00004/kWh. The 2009 update of MIT’s Future of Nuclear Power shows that the capital cost of new coal plants is $2.30/watt, compared to LWRs at $4/watt. The median of five cost studies of large molten salt reactors from 1962 to 2002 is $1.98/watt, in 2009 dollars. Costs for scaled-down 100 MW reactors can be similarly low for a number of reasons, six of which we summarize briefly: Pressure. The LFTR operates at atmospheric pressure, obviating the need for a large containment dome. At atmospheric pressure there is no danger of an explosion. Safety. Rather than creating safety with multiple defense-in-depth systems, LFTR’s intrinsic safety keeps such costs low. A molten salt reactor cannot melt down because the normal operating state of the core is already molten. The salts are solid at room temperature, so if a reactor vessel, pump, or pipe ruptured they would spill out and solidify. If the temperature rises, stability is intrinsic due to salt expansion. In an emergency an actively cooled solid plug of salt in a drain pipe melts and the fuel flows to a critically safe dump tank. The Oak Ridge MSRE researchers turned the reactor off this way on weekends. Heat. The high heat capacity of molten salt exceeds that of the water in PWRs or liquid sodium in fast reactors, allowing compact geometries and heat transfer loops utilizing high-nickel metals. Energy conversion efficiency. High temperatures enable 45% efficient thermal/electrical power conversion using a closed-cycle turbine, compared to 33% typical of existing power plants using traditional Rankine steam cycles. Cooling requirements are nearly halved, reducing costs and making air-cooled LFTRs practical where water is scarce. Mass production. Commercialization of technology lowers costs as the number of units produced increases due to improvements in labor efficiency, materials, manufacturing technology, and quality. Doubling the number of units produced reduces cost by a percentage termed the learning ratio, which is often about 20%. In The Economic Future of Nuclear Power, University of Chicago economists estimate it at 10% for nuclear power reactors. Reactors of 100 MW size could be factory-produced daily in the way that Boeing Aircraft produces one airplane per day. At a learning ratio of 10%, costs drop 65% in three years. Ongoing research. New structural materials include silicon-impregnated carbon fiber with chemical vapor infiltrated carbon surfaces. Such compact thin-plate heat exchangers promise reduced size and cost. Operating at 950°C can increase thermal/electrical conversion efficiency beyond 50% and also improve water dissociation to create hydrogen for manufacture of synthetic fuels such that can substitute for gasoline or diesel oil, another use for LFTR technology. In summary, LFTR capital cost targets of $2/watt are supported by simple fluid fuel handling, high thermal capacity heat exchange fluids, smaller components, low pressure core, high temperature power conversion, simple intrinsic safety, factory production, the learning curve, and technologies already under development. A $2/watt capital cost contributes $0.02/kWh to the power cost. With plentiful thorium fuel, LFTRs may indeed generate electricity at less than $0.03/kWh, underselling power generated by burning coal. Producing one LFTR of 100 MW size per day could phase out all coal burning power plants worldwide in 38 years, ending 10 billion tons per year of CO2 emissions from coal plants.

#### Talking about state policies that improve the ways we produce energy and contest climate change has a radical potential. The 1AC affirms a militant pluralist assemblage tasked with exploring new strategies for reducing inequality and changing human interaction with our so-called ‘environment.’

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.

#### We should stop treating structures as unmovable wholes—all it takes is one crack to expose the fragility of oppressive institutions. The plan is a radical experiment in democratic politics.

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

A philosophy attending to the acceleration, expansion, irrationalities, interdependencies and fragilities of late capitalism suggests that we do not know with confidence, in advance of experimental action, just how far or fast changes in the systemic character of neoliberal capitalism can be made. The structures often seem solid and intractable, and indeed such a semblance may turn out to be true. Some may seem solid, infinitely absorptive, and intractable when they are in fact punctuated by hidden vulnerabilities, soft spots, uncertainties and potential lines of flight that become apparent as they are subjected to experimental action, upheaval, testing, and strain. Indeed, no ecology of late capitalism, given the variety of forces to which it is connected by a thousand pulleys, vibrations, impingements, dependencies, shocks and thin threads, can specify with supreme confidence the solidity or potential flexibility of the structures it seeks to change. The strength of structural theory, at its best, was in identifying institutional intersections that hold a system together; its conceit, at its worst, was the claim to know in advance how resistant those intersections are to potential change. Without adopting the opposite conceit, it seems important to pursue possible sites of strategic action that might open up room for productive change. Today it seems important to attend to the relation between the need for structural change and identification of multiple sites of potential action. You do not know precisely what you are doing when you participate in such a venture. You combine an experimental temper with the appreciation that living and acting into the future inevitably carries a shifting quotient of uncertainty with it. The following tentative judgments and sites of action may be pertinent.

#### Praxis can be hard, but planning action is essential for achieving our critical goals. The world is not reducible solely to discourse—subjectivity is also positioned within material circumstances that influence thought—this demands particular strategies for change

Bryant ’12 Levi Bryant, teaches philosophy at Collin College, “RSI, Discursivity, Critique, and Politics,” Larval Subjects, 7/18/2012, http://larvalsubjects.wordpress.com/2012/07/18/rsi-discursivity-critique-and-politics/

If I get worked up about these issues, then this is because I think they’ve created serious lacuna in our political theory and practice. Suppose I focus on norms, for example. Great, I’ve developed a theory of norms and how they contribute to the social fabric. Yet while Kant claims that “ought implies can”, I’m not so sure. You’ve shown that something is unjust or that this would be the reasonable way to proceed. But at the real-material level people are caught in sticky networks that suck them into life in particular ways. They ought, for example, to drive an electric car, but what if it’s not available where they are or what if they can’t afford it? Well they should do whatever they can to get it? But what of their other obligations such as eating, sheltering themselves, taking care of their children, paying their medical bills, etc? It would be so nice if we just had mistaken beliefs or failed to recognize the right norms. Things would be so easy then. But there’s life, there’s the power of things. Sometimes the issues aren’t ones of ideology– and yes, of course, I recognize that ideology is probably involved in making electric cars expensive and hard to obtain, but not for them always –sometimes they’re simply issues of the power of things. And if we treat things as blank screens we’ll have difficulty seeing this and we’ll miss out on other opportunities for engagement. Long ago I used to keep track of my blog. I had a map that showed me where all my visits were coming from about the world. I noticed that the interior portions of the United States were largely dark with no visits and that the coasts and cities had a high volume of traffic. Given that my blog talks about all sorts of things ranging from weather patterns to beavers to mantis shrimps to octopi (I get all these random visits from folks searching for these things), it followed that the absence of traffic from these regions of the country couldn’t be explained in terms of a lack of interest in French and continental philosophy (yes, I recognize that there are also cultural reasons folks from these reasons might shy away from such things). What then was it? I think the answer must be that there’s a lack easy and inexpensive internet access from these portions of the country. Notice also that these regions of the country are also the most conservative regions of the country. Could there be a relation between lack of access and conservatism? I am not suggesting that lack of access is the cause of conservatism and fundamentalism. Clearly there’s a whole history in these regions and an entire set of institutions that exercise a particular inertia. I’m saying that if the only voices you hear are those in your immediate community, how much opportunity is there to think and imagine otherwise? You’re only exposed to the orthodoxy of your community and their sanctions. I am also not saying that if you give people the internet they’ll suddenly become radical leftists. Minimally, however, they’ll have a vector of deterritorialization that allows them to escape the constraints of their local social field. All of this begs the question of who critique is for. If it can’t get to the audience that you want to change, what’s it actually doing? Who’s it addressed to? Sometimes you get the sense that the practice of radical political philosophy and critical theory is a bit like the Underpants Gnomes depicted in South Park: The Underpants Gnomes have a plan for success: collect underwear —>; ? [question mark] —->; profit. This is like our critical theorists: debunk/decipher —>; ? [question mark] —->; revolution! The problem is the question mark. We’re never quite sure what’s supposed to come between collecting the underwear and profit, between debunking and revolution. This suggests an additional form of political engagement. Sometimes the more radical gesture is not to debunk and critique, but to find ways to lay fiber optic cables, roads, plumbing, etc. How, for example, can a people rise up and overturn their fundamentalist dictators if they’re suffering from typhoid and cholera as a result of bad plumbing and waste disposal? How can people overturn capitalism when they have to support families and need places to live and have no alternative? Perhaps, at this point, we need a little less critique and a little more analysis of the things that are keeping people in place, the sticky networks or regimes of attraction. Perhaps we need a little more carpentry. This has real theoretical consequences. For example, we can imagine someone writing about sovereignty, believing they’re making a blow against nationalism by critiquing Schmitt and by discussing Agamben, all the while ignoring media of communication or paths of relation between geographically diverse people as if these things were irrelevant to nationalism occurring. Ever read Anderson on print culture and nationalism? Such a person should. Yet they seem to believe nationalism is merely an incorporeal belief that requires no discussion of material channels or media. They thereby deny themselves of all sorts of modes of intervention, hitching everything on psychology, attachment, and identification. Well done!

#### A responsible politics must learn to appreciate the contours and crannies permeating existence. Singular, unitary, and whole accounts of being are inevitably unsettled in confrontations with alterity; they respond with hatred, reactivity, and violence. A responsible politics must cultivate a sense of *becoming*. Evaluate this debate in terms of competing responses to difference.

Connolly ’11 William E. Connolly, Krieger-Eisenhower Professor of Political Science at Johns Hopkins University, A World of Becoming, 2011, p. 5-8

A force-field, roughly speaking, is any energized pattern in slow or rapid motion periodically displaying a capacity to morph, such as a climate system, biological evolution, a political economy, or human thinking. As we shall explore in chapter 1, different force-fields display differential capacities of agency. We inhabit a world of becoming composed of heterogeneous force-fields; and we also participate in two registers of temporal experience, each of which can help us to get bearings in such a world. It is when the story of multiple force-fields of different types, in and beyond the human estate, is linked to the exploration of two registers of temporal experience in the human estate that things get interesting. Nonetheless, the themes of this book may carry little weight for anyone who finds nothing of interest in the Barton Fink scene or in a moment from their own past that resonates somehow with the scene I have painted from mine. You may give singular priority to the demands of punctual time while I seek to maintain a tense balance between the incorrigible demands and pleasures of operational perception set in punctual time (the kids’ attention to that spinning bottle as it drew to a halt) and the need to dwell periodically in protean moments that exceed the operational demands of action. You may initially connect the temper I commend to ‘‘optimism’’ or ‘‘romanticism’’ rather than to the pessimism, coolness, realism, or abiding sense of the negative that you respect. I don’t see it that way, though. My sense is that those who jump to such a conclusion have too limited an arsenal of ontological alternatives available. To appreciate two registers of experience in a world of becoming can also help us come to terms with tragic possibility. Such an appreciation encourages us to embrace the world as we act and intervene resolutely in it, even though it is replete with neither divine providence nor ready susceptibility to human mastery. Indeed, I don’t read the absence of providence or mastery as a ‘‘lack,’’ finding the use of that term by some to express a hangover of previous views inadequately overcome in the view officially adopted. I also know that shared experiences of grief or loss can help to consolidate connections with others, and that collective anger, resentment, and indignation are often indispensable spurs to critical action. So there is no sense here that ‘‘thinking it is so makes it so’’ or that ‘‘optimism is always healthy.’’ These orientations are attached to a different take on existence than that advanced here, though there are people who confuse the two. I do suspect that when inordinate drives for individual self-sufficiency, unity, community, consensus, or divine redemption are severely disappointed, things can become dangerous. These disappointed drives—I am sure there are others as well—readily cross over into entrenched dispositions to take revenge on the most fundamental terms of human existence, as a person, a constituency, or a putative nation grasps those terms. If and when that happens, an exclusionary, punitive, scandal-ridden, bitter politics is apt to result, regardless of how the carriers represent themselves to others. Here actions speak louder than words. A world of becoming has considerable evidence on its side, as we shall see; and affirmation of this condition without existential resentment provides one way to act resolutely in the world while warding off individual and collective drives to existential resentment. There are others, as we shall also see. Given the human predicament (explored in chapter 4), no theological or nontheological perspective at this level carries iron-clad guarantees. A crack or fissure running through every final perspective is part of the human predicament as I construe it. On my rendering, the course of time is neither governed solely by a pattern of efficient causation—where each event is determined to occur by some prior event in linear temporal order—nor expressive of an inherent purpose revolving around the human animal as such. Neither/nor. To put it in different terms, time is neither mechanical nor organic, and its human apprehension is neither susceptible to the method of ‘‘individualism’’ nor that of ‘‘holism.’’ We participate, rather, in a world of becoming in a universe set on multiple zones of temporality, with each temporal force-field periodically encountering others as outside forces, and the whole universe open to an uncertain degree. From this perspective, tragic possibility—not inevitability but possibility—is real: tragic possibility as seen from the vantage point of your time or country or species; tragic possibility sometimes actualized through the combination of hubris and an unlikely conjunction of events. Or by some other combination. I even suspect that differential degrees of agency in other force-fields, with which we enter into encounters of many types, increases the risk of that possibility. The universe is not only open; there is an ‘‘outside’’ to every temporal force-field. We are not only limited as agents, but part of our limitation comes from the different degrees of agency in other force-fields with which we interact. The operation of multiple tiers of becoming in a world without a higher purpose amplifies the need to act with dispatch, and sometimes with militancy, in particular situations of stress. The fact that we are not consummate agents in such a world, combined with the human tendency to hubris, means that we must work to cultivate wisdom under these very circumstances. These two dictates, engendering each other while remaining in tension, constitute the problematic of political action in a world of becoming. William James, Henri Bergson, Friedrich Nietzsche, Alfred North Whitehead, and Gilles Deleuze all advance different versions of time as becoming. Perhaps Merleau-Ponty and Marcel Proust do too, with qualifications. I draw from several of them the idea that it takes both philosophical speculation linked to scientific experiment and dwelling in uncanny experiences of duration to vindicate such an adventure. Both. Luckily, as we shall see, some strains of complexity theory in the natural sciences also support the theme of time as becoming as they compose new experiments and rework classical conceptions of causality. Moreover, in everyday life fugitive glimmers of becoming are available to more people more of the time, as we experience the acceleration of many zones of life, the enhanced visibility of natural disasters across the globe, the numerous pressures to minoritize the entire world along several dimensions at a more rapid pace, the globalization of capital and contingency together, the previously unexpected ingress of capital into climate change, the growing number of film experiments with the uncanniness of time, and the enlarged human grasp of the intelligence and differential degrees of agency in other plant and animal species. Such experiences and experiments together call into question early modern conceptions of time. Many respond to such experiences by intensifying religious and secular drives to protect an established image, as either linear and progressive or infused with divine providence. I suspect, however, that such responses— unless their proponents actively engage the comparative contestability of them without deep existential resentment—can amplify the dangers and destructiveness facing our time. Or, at least, they need to be put into more active competition with a conception that speaks to an array of contemporary experiences otherwise pushed into the shadows. To amplify the experience of becoming is one affirmative way to belong to time today. Active exploration and support of such a perspective can make a positive contribution to the late-modern period by drawing more people toward such a perspective or by showing others how much work they need to do to vindicate their own perspective. I belong to a growing contingent who think that a perspective defined by active examination of becoming can make positive contributions to explorations of spirituality, economics, political action, poetic experience, and ethics.

#### The intellectual exploration behind the 1AC is not just another positivist or technoscientific epistemology—the aff employs thorium power and climate science not as matters of fact, but matters of concern, cultivating an ethic of care for difference

Latour ‘4 Bruno Latour, Professor and vice-president for research at Sciences Po Paris, “Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern,” Critical Inquiry 30, Winter 2004

Do you see why I am worried? Threats might have changed so much that we might still be directing all our arsenal east or west while the enemy has now moved to a very diﬀerent place. After all, masses of atomic missiles are transformed into a huge pile of junk once the question becomes how to defend against militants armed with box cutters or dirty bombs. Why would it not be the same with our critical arsenal, with the neutron bombs of deconstruction, with the missiles of discourse analysis? Or maybe it is that critique has been miniaturized like computers have. I have always fancied that what took great eﬀort, occupied huge rooms, cost a lot of sweat and money, for people like Nietzsche and Benjamin, can be had for nothing, much like the supercomputers of the 1950s, which used to ﬁll large halls and expend a vast amount of electricity and heat, but now are accessible for a dime and no bigger than a ﬁngernail. As the recent advertisement of a Hollywood ﬁlm proclaimed, “Everything is suspect . . . Everyone is for sale . . . And nothing is what it seems.” What’s happening to me, you may wonder? Is this a case of midlife crisis? No, alas, I passed middle age quite a long time ago. Is this a patrician spite for the popularization of critique? As if critique should be reserved for the elite and remain diﬃcult and strenuous, like mountain climbing or yachting, and is no longer worth the trouble if everyone can do it for a nickel? What would be so bad with critique for the people? We have been complaining so much about the gullible masses, swallowing naturalized facts, it would be really unfair to now discredit the same masses for their, what should I call it, gullible criticism? Or could this be a case of radicalism gone mad, as when a revolution swallows its progeny? Or, rather, have we behaved like mad scientists who have let the virus of critique out of the conﬁnes of their laboratories and cannot do anything now to limit its deleterious effects; it mutates now, gnawing everything up, even the vessels in which it is contained? Or is it an another case of the famed power of capitalism for recycling everything aimed at its destruction? As Luc Boltanski and Eve Chiapello say, the new spirit of capitalism has put to good use the artistic critique that was supposed to destroy it. 9 If the dense and moralist cigar-smoking reactionary bourgeois can transform him- or herself into a free- ﬂoating agnostic bohemian, moving opinions, capital, and networks from one end of the planet to the other without attachment, why would he or she not be able to absorb the most sophisticated tools of deconstruction, social construction, discourse analysis, postmodernism, postology? In spite of my tone, I am not trying to reverse course, to become reactionary, to regret what I have done, to swear that I will never be a constructivist any more. I simply want to do what every good military oﬃcer, at regular periods, would do: retest the linkages between the new threats he or she has to face and the equipment and training he or she should have in order to meet them—and, if necessary, to revise from scratch the whole paraphernalia. This does not mean for us any more than it does for the oﬃcer that we were wrong, but simply that history changes quickly and that there is no greater intellectual crime than to address with the equipment of an older period the challenges of the present one. Whatever the case, our critical equipment deserves as much critical scrutiny as the Pentagon budget. My argument is that a certain form of critical spirit has sent us down the wrong path, encouraging us to ﬁght the wrong enemies and, worst of all, to be considered as friends by the wrong sort of allies because of a little mistake in the deﬁnition of its main target. The question was never to get away from facts but closer to them, not ﬁghting empiricism but, on the contrary, renewing empiricism. What I am going to argue is that the critical mind, if it is to renew itself and be relevant again, is to be found in the cultivation of a stubbornly realist attitude—to speak like William James—but a realism dealing with what I will call matters of concern, not matters of fact. The mistake we made, the mistake I made, was to believe that there was no eﬃcient way to criticize matters of fact except by moving away from them and directing one’s attention toward the conditions that made them possible. But this meant accepting much too uncritically what matters of fact were. This was remaining too faithful to the unfortunate solution inherited from the philosophy of Immanuel Kant. Critique has not been critical enough in spite of all its sore-scratching. Reality is not deﬁned by matters of fact. Matters of fact are not all that is given in experience. Matters of fact are only very partial and, I would argue, very polemical, very political renderings of matters of concern and only a subset of what could also be called states of aﬀairs. It is this second empiricism, this return to the realist attitude, that I’d like to oﬀer as the next task for the critically minded. To indicate the direction of the argument, I want to show that while the Enlightenment proﬁted largely from the disposition of a very powerful descriptive tool, that of matters of fact, which were excellent for debunking quite a lot of beliefs, powers, and illusions, it found itself totally disarmed once matters of fact, in turn, were eaten up by the same debunking impetus. After that, the lights of the Enlightenment were slowly turned oﬀ, and some sort of darkness appears to have fallen on campuses. My question is thus: Can we devise another powerful descriptive tool that deals this time with matters of concern and whose import then will no longer be to debunk but to protect and to care, as Donna Haraway would put it? Is it really possible to transform the critical urge in the ethos of someone who adds reality to matters of fact and not subtract reality? To put it another way, what’s the diﬀerence between deconstruction and constructivism? “So far,” you could object, “the prospect doesn’t look very good, and you, Monsieur Latour, seem the person the least able to deliver on this promise because you spent your life debunking what the other more polite critics had at least respected until then, namely matters of fact and science itself. You can dust your hands with ﬂour as much as you wish, the black fur of the critical wolf will always betray you; your deconstructing teeth have been sharpened on too many of our innocent labs—I mean lambs!—for us to believe you.” Well, see, that’s just the problem: I have written about a dozen books to inspire respect for, some people have said to uncritically glorify, the objects of science and technology, of art, religion, and, more recently, law, showing every time in great detail the complete implausibility of their being socially explained, and yet the only noise readers hear is the snapping of the wolf’s teeth. Is it really impossible to solve the question, to write not matter-of-factually but, how should I say it, in a matter-of-concern way? 10

#### Even if our aff does not resolve calculative thinking or our alienation from the environment, our advocacy of policy changes to address global warming is still essential. The scientific consensus around warming is not replicated in current politics. We should recognize and contest the destitution emblematic in warming denialism.

Housman 11 Benjamin H. Housman Undergradute Honor’s Thesis at Emory titled “Cooling Down Global Warming: Revisiting Sartre and Heidegger on this Modern Day Challenge“ April 14, 2011, PJF

Up to this point we have explored existential theories of responsibility, social ontology, and Heidegger’s philosophy of technology as each relates to global warming. But what about public policy; what about the formal laws that often dictate the norms and behavior of citizens within a society? As we discussed in the first chapter, a green revolution is in order. A green revolution will demand action that alters the state of our current nation and reevaluates our laws towards sustainability. According to Thomas Friedman, the green revolution will hopefully transform laws, thereby causing a dramatic change in the social consciousness of this country. Friedman said, in comparing the civil rights movement to a potential green movement, “Ultimately, it was about changing laws, so that no one had an option to discriminate, and it was those laws that ultimately changed the behavior and consciousness of tens of millions of people. But the civil rights movement started with citizen activism” (398). In order for such a green revolution to occur, as was the case with the civil rights movement, citizen activism in the form of a strong social ensemble resembling Sartre’s group must emerge. But, alas, we are forgetting an important part of this story: What, exactly, will these green laws entail; how will the government legislate sustainability? It is beyond the scope of this paper to speculate on the efficacy and economics of potential policies like a carbon tax or a cap-and-trade system. While new legislation certainly will not resolve Heidegger’s concerns about our loss of meditative thinking and treatment of things as standing reserve, it may still contribute significantly towards minimizing our greenhouse gas emissions and fighting global warming. However, before any law can ever realistically be pushed through Congress, a change in the attitude and beliefs towards our environment must occur. Pragmatism, a largely American philosophy, promotes the belief that we should seek to bring our diverse values, experiences, and perspectives into a harmonious pluralism. For pragmatists, policy serves as a powerful tool for meeting the challenges we experience in society. As Dr. John Stuhr, a scholar in American pragmatism, says regarding the pragmatist’s view towards philosophy: [I]t must be practical, critical, and reconstructive; it must aim at the successful transformation or amelioration of the experienced problems which call it forth and intrinsically situate it, and its success must be measured in terms of this goal. Thus, for the classical American philosophers, philosophy is primarily an instrument for the ongoing critical reconstruction of daily practice. (3) Philosophy must reside close to our experience and serve to change our environment in such a way that the problems plaguing society can be overcome through constructive activity. Thus, pragmatism is very much a “doer’s” philosophy and does not promote the traditional image of an intellectual lost in theory, detached from the world that surrounds him; rather, pragmatists wish to shake the very norms and rules of society if such a change is called for. But how can a pragmatic, policy-oriented approach to global warming that also accepts the plurality of attitudes, beliefs, and values in this country ever result in any action without undermining the very diversity of opinion on global warming? In other words, what sort of compromise, or harmonious pluralism, could possibly exist between people with fundamentally conflicting ideologies: those who adamantly believe in global warming and those who just as vigorously reject it? To make this question even more difficult to answer, research suggests that within the last decade a growing disparity between partisan ideologies over global warming has occurred. The trends indicate that Republicans are becoming increasingly skeptical of global warming while Democrats are becoming increasingly convinced of its reality.16 This trend was just recently epitomized in a bill (H.R. 910) authored by Republican Ed Whitfield, chairman of the Subcommittee on Energy and Power, that was approved and sent to the House of Representatives. The bill intends to prevent the Environmental Protection Agency from managing greenhouse gas emissions. According to an editorial in a major journal entitled “Into Ignorance”, during a recent subcommittee hearing on March 14, “Misinformation was presented as fact, truth was twisted and nobody showed any inclination to listen to scientists, let alone learn from them.”17 The article proceeds to say: “That this legislation is unlikely to become law doesn't make it any less dangerous. It is the attitude and ideas behind the bill that are troublesome, and they seem to be spreading” (266). These growing anti global-warming bills only exacerbate the political stalemate that continues to block progress and change. The “attitude” behind this bill—namely, that global warming either is not real or that it does not pose any sort of threat to us or our environment—exemplifies the very lack of distress felt in our society over this pressing issue. We again come back to this same question: how can we foster a plurality of beliefs and find a harmonious pluralism when political ideologies clash so fundamentally; how can government representatives make any sort of progress when such a blatant partisan divide exists? Unfortunately there is no easy solution to this problem. Many citizens feel demoralized and pessimistic precisely because of this very clear dissension within our government. Ironically, though, the scientific community is virtually unanimous on global warming; 97-98% of active climate researchers believe that climate change has resulted from human activities.18 Similarly, the Intergovernmental Panel on Climate Change (IPCC), the leading international body for the assessment of climate change, argued in a 2001 report that anthropogenic behavior has caused the rise in global temperatures. The IPCC, to which thousands of scientists contribute, stated in the report: “Anthropogenic factors do provide an explanation of 20th century temperature change...[and] it is unlikely that detection studies have mistaken a natural signal for an anthropogenic signal.”19 Some scientists, in fact, believe that the IPCC’s report erred on the moderate side and underestimated the effects that may occur from warming the planet.20 So, what will it take for the virtually unanimous scientific opinion to translate into political belief and action? In other words, what will it take to persuade Republican officials that global warming is real and caused by us? We have already mentioned the need for us to unite through a green revolution, but the strength of this movement is lacking right now due to this tension in public and political opinion about climate change. Ultimately, the pluralistic attitudes towards global warming must collapse into a more unified belief in its reality. As Trevors and Saier Jr. state in a journal article entitled “A Vaccine Against Ignorance,” lies against global warming continue to be disseminated even though the scientific evidence is “unequivocal.”21 The solution they propose: education. They say, “Humanity certainly needs to be immunized with a vaccine for ignorance, and we propose that the vaccine is education.” Thus, the last two sections of this chapter will investigate two necessary areas of education on global warming. The first area of education must be in public awareness; ensuring that the public has been exposed to the large body of scientific data that shows the anthropogenic cause of global warming. Once public awareness increases and people become better informed, a more unified societal attitude towards global warming that resembles a Sartrean group (rather than our current Sartrean collective) is more likely to emerge and politicians may then be swayed by public pressure and opinion. The other area of education must stress the need for a greater appreciation of our natural environment—it must remind us of our humble place within this earth’s dynamic whole, and call attention to the positioned, technological world that impairs an ethic of care towards our environment.

## 2AC

### Case

#### Consumption is inevitable—the most immediate question is how we do it—nuclear is the best way

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.

#### The practical alternatives to nuclear are way worse

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’, “Why Fukushima made me stop worrying and love nuclear power,” The Guardian, 3/21/2011, http://www.guardian.co.uk/commentisfree/2011/mar/21/pro-nuclear-japan-fukushima

But the energy source to which most economies will revert if they shut down their nuclear plants is not wood, water, wind or sun, but fossil fuel. On every measure (climate change, mining impact, local pollution, industrial injury and death, even radioactive discharges) coal is 100 times worse than nuclear power. Thanks to the expansion of shale gas production, the impacts of natural gas are catching up fast. Yes, I still loathe the liars who run the nuclear industry. Yes, I would prefer to see the entire sector shut down, if there were harmless alternatives. But there are no ideal solutions. Every energy technology carries a cost; so does the absence of energy technologies. Atomic energy has just been subjected to one of the harshest of possible tests, and the impact on people and the planet has been small. The crisis at Fukushima has converted me to the cause of nuclear power.

#### We can’t just put technology back in the bag. Instead of rejecting all consumption in a nostalgic drive to return to primitivity, we need to learn to innovate better.

Latour ’12 Bruno Latour, “Love Your Monsters,” 6/5/2012, http://convozine.com/monster-theory/31585

Frankenstein lives on in the popular imagination as a cautionary tale against technology. We use the monster as an all-purpose modifier to denote technological crimes against nature. When we fear genetically modified foods we call them "frankenfoods" and "frankenfish." It is telling that even as we warn against such hybrids, we confuse the monster with its creator. We now mostly refer to Dr. Frankenstein's monster as Frankenstein. And just as we have forgotten that Frankenstein was the man, not the monster, we have also forgotten Frankenstein's real sin. Dr. Frankenstein's crime was not that he invented a creature through some combination of hubris and high technology, but rather that he abandoned the creature to itself. When Dr. Frankenstein meets his creation on a glacier in the Alps, the monster claims that it was not born a monster, but that it became a criminal only after being left alone by his horrified creator, who fled the laboratory once the horrible thing twitched to life. "Remember, I am thy creature," the monster protests, "I ought to be thy Adam; but I am rather the fallen angel, whom thou drivest from joy for no misdeed... I was benevolent and good; misery made me a fiend. Make me happy, and I shall again be virtuous." Written at the dawn of the great technological revolutions that would define the 19th and 20th centuries, Frankenstein foresees that the gigantic sins that were to be committed would hide a much greater sin. It is not the case that we have failed to care for Creation, but that we have failed to care for our technological creations. We confuse the monster for its creator and blame our sins against Nature upon our creations. But our sin is not that we created technologies but that we failed to love and care for them. It is as if we decided that we were unable to follow through with the education of our children.4 Let Dr. Frankenstein's sin serve as a parable for political ecology. At a time when science, technology, and demography make clear that we can never separate ourselves from the nonhuman world -- that we, our technologies, and nature can no more be disentangled than we can remember the distinction between Dr. Frankenstein and his monster -- this is the moment chosen by millions of well-meaning souls to flagellate themselves for their earlier aspiration to dominion, to repent for their past hubris, to look for ways of diminishing the numbers of their fellow humans, and to swear to make their footprints invisible? The goal of political ecology must not be to stop innovating, inventing, creating, and intervening. The real goal must be to have the same type of patience and commitment to our creations as God the Creator, Himself. And the comparison is not blasphemous: we have taken the whole of Creation on our shoulders and have become coextensive with the Earth.

#### Environmental destruction IS an important impact, not because we presume a value or meaning in nature but because it is an other to which we owe responsibility

Wapner ‘3 Paul Wapner, associate professor and director of the Global Environmental Policy Program at American University. “Leftist Criticism of "Nature" Environmental Protection in a Postmodern Age,” Dissent Winter 2003

The third response to eco-criticism would require critics to acknowledge the ways in which they themselves silence nature and then to respect the sheer otherness of the nonhuman world. Postmodernism prides itself on criticizing the urge toward mastery that characterizes modernity. But isn't mastery exactly what postmodernism is exerting as it captures the nonhuman world within its own conceptual domain? Doesn't postmodern cultural criticism deepen the modernist urge toward mastery by eliminating the ontological weight of the nonhuman world? What else could it mean to assert that there is no such thing as nature? I have already suggested the postmodernist response: yes, recognizing the social construction of "nature" does deny the self-expression of the nonhuman world, but how would we know what such self-expression means? Indeed, nature doesn't speak; rather, some person always speaks on nature's behalf, and whatever that person says is, as we all know, a social construction. All attempts to listen to nature are social constructions-except one. Even the most radical postmodernist must acknowledge the distinction between physical existence and non-existence. As I have said, postmodernists accept that there is a physical substratum to the phenomenal world even if they argue about the different meanings we ascribe to it. This acknowledgment of physical existence is crucial. We can't ascribe meaning to that which doesn't appear. What doesn't exist can manifest no character. Put differently, yes, the postmodernist should rightly worry about interpreting nature's expressions. And all of us should be wary of those who claim to speak on nature's behalf (including environmentalists who do that). But we need not doubt the simple idea that a prerequisite of expression is existence. This in turn suggests that preserving the nonhuman world-in all its diverse embodiments-must be seen by eco-critics as a fundamental good. Eco-critics must be supporters, in some fashion, of environmental preservation. Postmodernists reject the idea of a universal good. They rightly acknowledge the difficulty of identifying a common value given the multiple contexts of our value-producing activity. In fact, if there is one thing they vehemently scorn, it is the idea that there can be a value that stands above the individual contexts of human experience. Such a value would present itself as a metanarrative and, as Jean-François Lyotard has explained, postmodernism is characterized fundamentally by its "incredulity toward meta-narratives." Nonetheless, I can't see how postmodern critics can do otherwise than accept the value of preserving the nonhuman world. The nonhuman is the extreme "other"; it stands in contradistinction to humans as a species. In understanding the constructed quality of human experience and the dangers of reification, postmodernism inherently advances an ethic of respecting the "other." At the very least, respect must involve ensuring that the "other" actually continues to exist. In our day and age, this requires us to take responsibility for protecting the actuality of the nonhuman. Instead, however, we are running roughshod over the earth's diversity of plants, animals, and ecosystems. Postmodern critics should find this particularly disturbing. If they don't, they deny their own intellectual insights and compromise their fundamental moral commitment. Now, what does this mean for politics and policy, and the future of the environmental movement? Society is constantly being asked to address questions of environmental quality for which there are no easy answers. As we wrestle with challenges of global climate change, ozone depletion, loss of biological diversity, and so forth, we need to consider the economic, political, cultural, and aesthetic values at stake. These considerations have traditionally marked the politics of environmental protection. A sensitivity to eco-criticism requires that we go further and include an ethic of otherness in our deliberations. That is, we need to be moved by our concern to make room for the "other" and hence fold a commitment to the nonhuman world into our policy discussions. I don't mean that this argument should drive all our actions or that respect for the "other" should always carry the day. But it must be a central part of our reflections and calculations. For example, as we estimate the number of people that a certain area can sustain, consider what to do about climate change, debate restrictions on ocean fishing, or otherwise assess the effects of a particular course of action, we must think about the lives of other creatures on the earth-and also the continued existence of the nonliving physical world. We must do so not because we wish to maintain what is "natural" but because we wish to act in a morally respectable manner. I have been using postmodern cultural criticism against itself. Yes, the postmodernists are right: we can do what we want with the nonhuman world. There is nothing essential about the realm of rocks, trees, fish, and climate that calls for a certain type of action. But postmodernists are also right that the only ethical way to act in a world that is socially constructed is to respect the voices of the others-of those with whom we share the planet but with whom we may not share a common language or outlook. There is, in other words, a limit or guiding principle to our actions. As political theorist Leslie Thiele puts it, "One can't argue for the diversity of views of "nature" without taking a stand for the diversity of nature."

### 2AC—Fem K [ISU DH]

#### Prefer plurality over unitary theory—our world of fragility and complexity can’t just be explained away by gender binaries. Mixing critique is the best strategy because it allows for greater theoretical agility—the alt alone is an anthropocentric denial of the activity of objects

Bryant ’12 Levi Bryant, teaches philosophy at Collin College, “RSI, Discursivity, Critique, and Politics,” Larval Subjects, 7/18/2012, http://larvalsubjects.wordpress.com/2012/07/18/rsi-discursivity-critique-and-politics/

What we need– or what I want –is something like the Lacanian Borromean Knot. Here the Imaginary would be the way in which one entity encounters another entity. For example, the way in which mantis shrimps encounter the world about them or the way in which people of another culture encounter the world around them. Each machine or object (the two are synonyms for me), encounters the world around it in a particular way. Each discipline encounters the world around it in a particular way and is blind to other aspects of the world. There are as many phenomenologies and transcendental structures of cognition as there are types of machines. There’s even a transcendental aesthetic, analytic, and dialectic for flowers. The symbolic would be the way in which entities capable of language signify the world through narratives, signifiers, signs, texts, etc. Who knows whether this is restricted to humans? As I’ve increasingly argued, I believe aliens live among us. They go by names like “corporation”, “army”, “government”, “institution”, etc. These beings, I believe, are irreducible to humans (the influence of Niklas Luhmann on me), and perhaps have their own symbolics. Just as we don’t know the language of dolphins, we don’t know the languages of these entities. They have their own symbolic. And perhaps likewise with bees, dolphins, octopi, and birds. Finally, the real is the dimension of irreducibility of a think to how it is perceived by another being (imaginary), or symbolized by another entity. It is the irreducible difference that a road has to affect us, for example, despite being created by us. The important caveat is 1) that there is no one borromean knot or RSI, and that 2) all three orders don’t need to be present for there to be being at work. The orders can become unglued, and in many instances some of the orders aren’t present at all. For example, I suspect that the order of the symbolic isn’t operative for bacteria (though the symbolic is at work for us when we talk about bacteria), though the order of the real and imaginary is at work for bacteria. How we work with bacteria in the symbolic, of course, does not undermine the real of bacteria or their ability to contribute differences irreducible to knowledge, signification, or belief. What’s important is that we practice something like what Bogost has call “alien phenomenology”, thinking the experiential world of nonhumans and others, and refusing to privilege one point of view on the universe.

#### Total disengagement from technology is disastrous—makes ecological devastation inevitable—engaging tech with care is best

Latour ’12 Bruno Latour, “Love Your Monsters,” 6/5/2012, http://convozine.com/monster-theory/31585

Frankenstein lives on in the popular imagination as a cautionary tale against technology. We use the monster as an all-purpose modifier to denote technological crimes against nature. When we fear genetically modified foods we call them "frankenfoods" and "frankenfish." It is telling that even as we warn against such hybrids, we confuse the monster with its creator. We now mostly refer to Dr. Frankenstein's monster as Frankenstein. And just as we have forgotten that Frankenstein was the man, not the monster, we have also forgotten Frankenstein's real sin. Dr. Frankenstein's crime was not that he invented a creature through some combination of hubris and high technology, but rather that he abandoned the creature to itself. When Dr. Frankenstein meets his creation on a glacier in the Alps, the monster claims that it was not born a monster, but that it became a criminal only after being left alone by his horrified creator, who fled the laboratory once the horrible thing twitched to life. "Remember, I am thy creature," the monster protests, "I ought to be thy Adam; but I am rather the fallen angel, whom thou drivest from joy for no misdeed... I was benevolent and good; misery made me a fiend. Make me happy, and I shall again be virtuous." Written at the dawn of the great technological revolutions that would define the 19th and 20th centuries, Frankenstein foresees that the gigantic sins that were to be committed would hide a much greater sin. It is not the case that we have failed to care for Creation, but that we have failed to care for our technological creations. We confuse the monster for its creator and blame our sins against Nature upon our creations. But our sin is not that we created technologies but that we failed to love and care for them. It is as if we decided that we were unable to follow through with the education of our children.4 Let Dr. Frankenstein's sin serve as a parable for political ecology. At a time when science, technology, and demography make clear that we can never separate ourselves from the nonhuman world -- that we, our technologies, and nature can no more be disentangled than we can remember the distinction between Dr. Frankenstein and his monster -- this is the moment chosen by millions of well-meaning souls to flagellate themselves for their earlier aspiration to dominion, to repent for their past hubris, to look for ways of diminishing the numbers of their fellow humans, and to swear to make their footprints invisible? The goal of political ecology must not be to stop innovating, inventing, creating, and intervening. The real goal must be to have the same type of patience and commitment to our creations as God the Creator, Himself. And the comparison is not blasphemous: we have taken the whole of Creation on our shoulders and have become coextensive with the Earth.

#### Prefer our politics of difference over their reductive identitarianism

Connolly ’99 William Connolly, Krieger-Eisenhower Professor of Political Science at Johns Hopkins University, Why I Am Not a Secularist, 1999, p. 51-54

The most difficult cases require a public ethos of critical engagement between interdependent, contending constituencies entangled in asymmetrical structures of power. Indeed, sometimes acting upon obligations to the deserving poor and victims of natural disaster, while important, also provides a moral cover for the obstinate refusal to negotiate a generous ethos of engagement with constituencies in more ambiguous, disturbing, competitive positions. The most complex ethical issues arise in those contexts where suffering is intense and its visitation upon some is bound up with securing the self-confidence, wholeness, transcendence, or cultural merit of others. That is, the most intense, intractable cases of suffering are political in character. They often revolve around what I will call the politics of becoming. The politics of becoming occurs when a culturally marked constituency, suffering under its negative constitution in an established institutional matrix, strives to reconfigure itself by moving the cultural constellation of identity\difference then in place. In such situations either the suffering of the subjugated constituency or the response required to open up a new line of flight for it is not acknowledged by some of the parties involved. Under these circumstances it takes a militant, experimental and persistent political movement to open up a new line of flight from culturally induced suffering. The movement strives to modify the identity institutionally imposed upon it by redefining those institutionally entrenched definitions. Success is never guaranteed. Such a movement, to succeed, must extend from those who initiate cultural experiments to others who respond sensitively to those experiments, even when the experiments disturb their own sense of identity. I bestow honor, then, upon the politics of becoming, not the politics of realization of an essence or universal condition already known in its basic structure by all reasonable persons. Indians, slaves, feminists, Jews, laborers, homosexuals, and secularists, among others, have participated in the politics of becoming in the past few centuries in Euro-American societies. But many citizens who now acknowledge the fruits of these movements, who repudiate the negative marks institutionally inscribed upon others in the past who participated in them, also forget how the politics of becoming proceeds when it is actually in motion. They treat retrospective interpretations of the politics of becoming as if the interpretations and institutional standing it helped to bring into being were “implicitly" available to participants when things were in motion. They act as if the initiating constituency either exposed hypocrisy in the profession of universal rights by the dominant group or prompted a cultural dialectic that fills out the logic already implicit in a just society. They reduce the politics of becoming to a social logic. And that attitude ill prepares them to respond to the next surprise in the politics of becoming in a reflective and sensitive way. Caputo is wary of both the model of hypocrisy and the model of dialectical progress. I am with him here. But his minimalist appreciation of culture and metaphysics flattens out the modes of suffering he can recognize. Caputo’s perspective may appear "minimal" by comparison to the models of a commanding (Christian) god and/or a teleological principle. Measured by these two perspectives, it lacks a final authority or a fundamental purpose of being. Lacking these supports, Caputo seems compelled to give (apparently) simple examples of suffering and to make obligation just "happen." For the two interdependent traditions Caputo resists appear to exhaust metaphysics only if meta is (mis)translated as “beyond."“ But if you construe metaphysics to be any reading of the fundamental character of things, it becomes clear that every positive cultural interpretation is inhabited by a metaphysical dimension. The call to metaphysical minimalism now becomes either a command to forget the perspective that moves you or a doomed attempt to live, act, judge, and respond without engaging in positive interpretation.9 Caputo takes a step in the direction I endorse when he speaks of an "intractable plurivocity“ coursing through things. But his drive to minimalism stops him from pursuing this thought. Does he lament the lass of a god who could communicate clear commands or draw us closer to the fundamental design of things? His critical reading of Nietzsche suggests this possibility, anyway, for Caputo reduces the thinker who pursued the theme of fundamental plurivocity more than anyone preceding him in the West to the visionary of a cold, cruel, world indifferent to suffering. Often Caputo bypasses the element of joyfulness, abundance, and possibility Nietzsche locates in the multiplicity of being; and the Nietzschean generosity he does acknowledge is never pure enough to fit the disinterested model of obligation he demands. My Nietzsche offers a positive metaphysic that breaks with some familiar options presented under the titles teleology, theological voluntarism, and secularism. But he does not embrace metaphysical minimalism either. He resists the "passive nihilism" that so readily accompanies such a liquid diet. Nietzsche affirms that concerted action is impossible without interpretation, that every particular interpretation invokes a fundamental conception of the world, and that every interpretive perspective remains questionable and contestable. He affirms, that is, life, in its ambiguous conditions of possibility. So Nietzsche interprets actively from within a distinctive, contestable reading of the fundaments of things. Here is one formulation of those fundaments, offered by Zarathustra, while preaching about "Old and New Tablets": When the water is spanned by planks, when bridges and railings leap over the river, verily those are believed who say, “Everything is in flux .... " But when the winter comes. . . ,then verily, not only the blockheads say, "Does not everything stand still?" "At bottom everything stands still"—that is truly a winter doctrine… O my brothers is everything not in flux now? Have not all railings and bridges fallen into the water? Who could still cling to "good" and “evil"?... The thawing wind blows—thus preach in every street, my brothers.10 Several thoughts mingle in Zarathustra’s saying. Things are mobile at bottom, rather than still or fixed. This experience of the mobility of things has profound, corrosive effects upon winter conceptions of nature, divinity, identity, truth, and ethics that have prevailed in the West. However, winter thoughts keep reinstating themselves in ways that treat the cultural ice as if it were frozen all the way down. This drive to find a solid bottom becomes powerful when suffering is intense; it can also be powerful when the identity of others unsettles your own claims to self-certainty. Moreover, the very character of language and limitations in our abilities to retain very many complex ideas at one time further reinforce the return of winter doctrines. You cannot dispense with them altogether or finally. But sometimes people struggle against these multiple pressures, doing so to open up a line of flight from intolerable suffering and/or to come to terms self-critically with cruelties against difference that often accompany the singular hegemony of winter doctrines. Zarathustra's perspective is both paradoxical and contestable. He can point to multiple disturbances and surprises that disrupt each new winter doctrine; he can provide pointers to a fundamental mobility of things that exceeds the reach of definitive demonstration. But he cannot set this contestable experience of mobility within things in the cement of truth. Truth cannot be a relation of correspondence for Nietzsche. For truth changes its place as well as its meaning in his thought. “Truth," in one of its valences, is those indispensable cultural productions that freeze things (representations of nature, identities, moral codes, and so on) temporarily and incompletely. Truth, as the cultural sedimentation of a perspective, occurs in a "regime of truth," as Foucault would say. On another register—for Nietzsche plays with "truth"—the Nietzschean true is the flux and potential for mutation circulating through the solid formations of social life and nature (for nature itself is unfinished), the surplus and noise that circulate through every solid formation, disturbing well-laid plans and creating possibilities for new becomings. Thus preach in every street my friends. Truth, when it is layered in its complexity, casts off the dimension of final solidity so crucial to the correspondence model while retaining the dimension of fundamentality invoked by that model. The true becomes unsusceptible to final or complete correspondence because of its very character. By disaggregating elements the correspondence model binds together Nietzsche, uncovers an alternative orientation to truth. Along this dimension, Nietzsche is closer to a-theologies of god(s) as absence, excess, or "nothing" than to secular conceptions of truth as correspondence, coherence, rational consensus, or pragmatic success. Nietzsche and Zarathustra tap into this fugitive experience, cultivating gratitude for the rich abundance of life. They cultivate gratitude for the surplus and porosity that endows life with mobility. Such a gratitude is "religious" without necessarily being monotheistic. It may find more intense expression in some times than others. What is astonishing about the religiosity of the ancient Greeks is the lavish abundance of gratitude that radiates from it. Only a very distinguished type of human being stands in that relation to nature and to life. Later, when the rabble came to rule in Greece, fear choked out religion and prepared the way for Christianity.11 Gratitude for the abundance of life, then, carries a contestable conception of being into ethics and politics.12 But such a temperament is not located above the play of identities, institutions, and principles. It is inserted into these media, rendering them more responsive to that which exceeds them, more generous and refined in their engagements with difference. Without the infusion of such gratitude, high-sounding principles will be applied in stingy, punitive ways. A theistic or nontheistic perspective that exudes gratitude for being can promote an ethic of generosity while trimming some of the cognitive fat from its theological or secular diet.

#### Alt cedes the political—turns the K—our advocacy solves

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

6. The democratic state, while it certainly cannot alone tame capital or reconstitute the ethos of consumption, must play a significant role in reconstituting our lived relations to climate, weather, resource use, ocean currents, tectonic instability, glacier flows, species diversity, work, local life, consumption, and investment, as it responds favorably to pressures to forge a new ethos. A New, new democratic Left will thus experimentally enact new intersections between role performance and political activity, outgrow its old disgust with the very idea of the state, and remain alert to the dangers states can pose. It will do so because, as already suggested, the fragile ecology of late capital requires state interventions of several sorts. A refusal to participate in the state today cedes too much hegemony to neoliberal markets, either explicitly or by implication. Some drives to fascism, remember, emerged the last time around in capitalist states after a total market meltdown. Most of those movements failed. But a couple became consolidated through a series of resonances (vibrations) back and forth between industrialists, state officials, and vigilante groups in neighborhoods, clubs, churches, the police, the media and pubs. You do not fight the danger of a new kind of neofascism by withdrawing from either micropolitics or state politics. You do so through a multi-sited politics designed to shift systemic interactions and to infuse a new ethos into the fabric of everyday life. Changes in ethos can sometimes open doors to new possibilities of state and interstate action, so that an advance in one domain seeds that in the other. And vice versa. A positive dynamic of mutual amplification might be generated here. Could a series of significant shifts in the routines of state and global capitalism even press the fractured system to a point where it hovers on the edge of capitalism itself? We don’t know. That is one reason it is important to focus on interim goals. Another is that in a world of becoming, replete with periodic and surprising shifts in the course of events, you cannot project far beyond an interim period. Another yet is that activism needs to project concrete, interim possibilities to gain support and propel itself forward. That being said, it does seem unlikely to me, at least, that a positive interim future includes either socialist productivism or the world projected by proponents of deep ecology.23

#### Sovereignty might get a bad rap but it isn’t nearly as bad as they make it out to be. Discourses of the law’s violent underside obscures its potential to get stuff done. We don’t always have to resist—we can see the state as strategic.

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, 2004, For What Tomorrow? A Dialogue With Elisabeth Roudinesco, p. 91-92

J.D.: A moment ago you spoke of regicide as the necessity of an ex­ception, in sum. Well, yes, one can refer provisionally to Carl Schmitt (whatever one may think of him, his arguments are always useful for prob­lematizing the “political” or the “juridical”; I examined this question in Pol­itics of Friendship). He says in effect that a sovereign is defined by his capacity to decide the exception. Sovereign is he who effectively decides the exception. The revolutionaries decided that at that moment that it was nec­essary to suspend justice and—in order to establish the law [droit] and to give the Revolution its rights—to suspend the rule of law [l’Etat de droit]. Schmitt also gives this definition of sovereignty: to have the right to sus­pend the law, or the rule of law, the constitutional state. Without this cate­gory of exception, we cannot understand the concept of sovereignty. Today, the great question is indeed, everywhere, that of sovereignty. Omnipresent in our discourses and in our axioms, under its own name or another, liter­ally or figuratively, this concept has a theological origin: the true sovereign is God. The concept of this authority or of this power was transferred to the monarch, said to have a “divine right.” Sovereignty was then delegated to the people, in the form of democracy, or to the nation, with the same the­ological attributes as those attributed to the king and to God. Today, wher­ever the word “sovereignty” is spoken, this heritage remains undeniable, whatever internal differentiation one may recognize in it. How do we deal with this? Here we return to the question of heritage with which we began. It is necessary to deconstruct the concept of sover­eignty, never to forget its theological filiation and to be ready to call this fil­iation into question wherever we discern its effects. This supposes an in­flexible critique of the logic of the state and of the nation-state. And yet—hence the enormous responsibility of the citizen and of the heir in general, in certain situations—the state, in its actual form, can resist cer­tain forces that I consider the most threatening. What I here call “responsibility” is what dictates the decision to be sometimes for the sovereign state and sometimes against it, for its deconstruction (“theoretical and practical,” as one used to say) according to the singularity of the contexts and the stakes. There is no relativism in this, no renunciation of the injunction to “think” and to deconstruct the heritage. This aporia is in truth the very condition of decision and responsibility—if there is any. I am thinking for example of the incoherent but organized coalition of international capitalist forces that, in the name of neoliberalism or the market,31 are taking hold of the world in conditions such as the “state” form; this is what can still resist the most. For the moment. But it is neces­sary to reinvent the conditions of resistance. Once again, I would say that according to the situations, I am an antisovereignist or a sovereignist—and I vindicate the right to be antisovereignist at certain times and a sovereignist at others. No one can make me respond to this question as though it were a matter of pressing a button on some old-fashioned machine. There are cases in which I would support a logic of the state, but I ask to examine each situation before making any statement. It is also necessary to recognize that by requiring someone to be not unconditionally sovereignist but rather soyvereignist only under certain conditions, one is already calling into question the principle of sovereignty. Deconstruction begins there. It demands a dif­ficult dissociation, almost impossible but indispensable, between uncondi­tionality (justice without power) and sovereignty (right, power, or potency). Deconstruction is on the side of unconditionaliry, even when it seems im­possible, and not sovereignty, even when it seems possible.

#### It isn’t helpful to think of the state as supreme and cunning to justify disengagement—it’s more important to identify methods of challenging oppression, including considerations of “non-revolutionary” alternatives.

Gilles Deleuze, “Toward Freedom” published in The Deleuze Reader, ed. Constantin V. Boundas, 1993, p.255-256

The mistake would be to say: there is a globalizing State, the master of its plans and extending its traps; and then, a force of resistance which will adopt the form of the State even if it entails betraying us, or else which fall into local spontaneous or partial struggles, even if it entails being suffocated and beaten every time. The most centralized State is not at all the master of its plans, it is also an experimenter, it performs injections, it is unable to look into the future: the economists of the State declare themselves incapable of predicting the increase in a monetary mass. American politics is forced to proceed by empirical injections, not at all by apodictic programs. What a sad and sham game is played by those who speak of a supremely cunning master, in order to present the image of themselves as rigorous, incorruptible, and "pessimist" thinkers. It is along the different lines of complex assemblages that the powers that be carry out their experiments, but along them also arise experimenters of another kind, thwarting predictions, tracing out active lines of flight, looking for the combination of these lines, increasing their speed or slowing it down, creating the plane of consistence fragment by fragment, with a war-machine that would weigh the dangers that it encountered at each step. What characterizes our situation is both beyond and on this side of the State. Beyond national States, the development of a world market, the power of multinational companies, the outline of a "planetary" organization, the extension of capitalism to the whole social body, clearly forms a great abstract machine which overcodes the monetary, industrial, and technological fluxes. At the same time the means of exploitation, control, and surveillance become more and more subtle and diffuse, in a certain sense molecular (the workers of the rich countries necessarily take part in the plundering of third world, men take part in the exploitation of women, etc.) But the abstract machine, with its dysfunctions, is no more fallible than national States which are not able to regulate them on their own territory and from one territory to another. The state no longer has at its disposal the political, institutional, or even financial means which would enable it to fend off the social repercussions of the machine; it is doubtful whether it can eternally rely on the old forms like the police, armies, bureaucracies, even trade union bureaucracies, collective installations, schools, families. Enormous land slides are happening on this side of the state, following lines of gradient or flight, affecting principally: (1) the marking of territories; (2) mechanisms of economic subjugation (new characteristics of unemployment, of inflation); (3) the basic regulatory frameworks (crisis of the school, of trade unions, of the army, of women…); (4) the nature of the demands which become qualitative as much as quantitative ("quality of life" rather than the "standard of living"). All this constitutes what can be called a right to desire. It is not surprising that all kinds of minority questions—linguistic, ethnic, regional, about sex, or youth—resurge not only as archaisms, but in up-to-date revolutionary form which call once more into question in an entirely immanent manner both the global economy of the machine and the assemblages of national States. Instead of gambling on the eternal impossibility of the revolution and on the fascist return of a war-machine in general, why not think that a new type of revolution is in the course of becoming possible, and that all kinds of mutating, living machines conduct wars, are combined and trace out a plane of consistence which undermines the plane of organization of the world and the States? For, once again, the world and its States are no more masters of their plan than revolutionaries are condemned to the deformation of theirs. Everything is played in uncertain games, "front to front, back to back, back to front…." The question of the revolution is a bad question because, insofar as it is asked, there are so many people who do not become, and this is exactly why it is done, to impede the question of the revolutionary-becoming of people, at every level, in every place.

# Rd 3 vs Gonzaga Harper/Newton

## 1AC

### 1

#### IPI ADVANTAGE

#### Scenario 1 is Iran prolif

#### Proposed Iran-Pakistan-India pipeline wrecks coop with key security council members like China and Russia against Iran prolif

Cohen & Curtis 8 (Ariel, Senior Research Fellow in Russian and Eurasian Studies and International Energy Security in the Douglas and Sarah Allison Cen­ter for Foreign Policy Studies, a division of the Kathryn and Shelby Cullom Davis Institute for International Studies, and Lisa, Senior Research Fellow for South Asia in the Asian Studies Center; and Owen Graham is a Research Assistant in the Allison Center at The Heritage Foundation, "The Proposed Iran-Pakistan-India Gas Pipeline: An Unacceptable Risk to Regional Security," May 30, [www.heritage.org/research/reports/2008/05/the-proposed-iran-pakistan-india-gas-pipeline-an-unacceptable-risk-to-regional-security], jam)

The foreign policies of India and Pakistan are driven increasingly by energy security. To sustain their booming economies and growing populations amid tight oil and gas markets, Indian and Pakistani policymakers are turning to energy deals with unsavory regimes, such as Iran's. At the same time, energy-producing states including Iran and Russia are attempting to tap new markets, drive up oil prices, and secure their own interests by locking in demand.¶ In 1993, Pakistan and Iran announced a plan to build a gas pipeline, which Iran later proposed extending into India. Dubbed the "peace pipeline," the Iran–Pakistan–India (IPI) gas pipeline would traverse over 2,775 kilometers (1,724 miles) from Iran's South Pars gas field in the Persian Gulf through the Pakistani city of Khuzdar, with one branch going on to Karachi and a second branch extending to Mul­tan and then on to India.[1] ¶ This pipeline would give Iran an economic lifeline and increase its leverage and influence in South Asia. U.S. policymakers argue that allowing the IPI pipeline to proceed would encourage the Iranian regime to defy the will of the international community, develop nuclear weapons, and support terrorism. Furthermore, inadequate investment in Iran's oil and gas industry and increasing domestic demand could render Iran incapable of supplying natural gas through the IPI.¶ Energy Geopolitics and South Asia¶ India and Pakistan consume 537 million tons of oil equivalent (Mtoe) and 54 Mtoe per year, respec­tively.[2] Islamabad and New Delhi are facing the growing challenge of supplying enough energy to meet rising domestic demand and develop their economies. By any standard, both countries are in a tight market because their local reserves are insuf­ficient to meet these growing demands.¶ According to the U.S. Department of Energy's International Energy Outlook 2007, world demand for energy is projected to grow by 57 percent by 2030.[3] Energy demand will grow most rapidly in India and Pakistan and other Asian countries that are not members of the Organisation for Economic Co-operation and Development (OECD). Meeting this demand will require producing an additional 35 million to 37 million barrels per day of petro­leum and other liquid fuels by 2030.[4] Yet according to the International Energy Agency, only an addi­tional 25 million barrels per day is planned.[5] In this context, it is little wonder that states are endeavor­ing to lock in energy supplies even if this requires dealing with rogue regimes.¶ Iran, Pakistan, and India have been negotiating for more than a decade to build a 2,775-kilometer gas pipeline from Iran's South Pars gas field in the Persian Gulf through Pakistan to India. The pipeline talks stalled in 1999–2003 because of Indo–Pakistani tensions, but they regained some momentum in 2004–2005 after New Delhi and Islamabad started a bilateral dialogue process. More recently, pricing disputes among the three countries have hampered progress. The memoran­dum of understanding on the project dates back to the mid-1990s, but no major international inves­tors have committed to the project, largely because of continuing U.S. sanctions on companies that invest more than $20 million annually in Iran's oil and gas sector.¶ In late April 2008, India and Pakistan held ministerial-level talks on both the IPI and Turk­menistan–Afghanistan–Pakistan–India (TAPI) pipeline projects. India's Minister for Petroleum and Natural Gas Murli Deora said that both pipe­lines are equally important to Indian energy interests. In May 2007, India joined the four-party intergovernmental agreement with the Asian Development Bank (ADB) on the proposed TAPI natural gas pipeline.[6] This pipeline would run from the Dauletabad gas field in Turkmeni­stan to the Indo–Pakistani border at a cost of $7.6 billion.¶ At the same time, energy-producing states including Iran and Russia are attempting to tap new markets, drive up oil prices, and enhance their own energy security by locking in demand. As Iran has become more isolated on the world stage, it has sought economic investment and political support from members of the U.N. Security Council. In this regard, China and Russia are key diplomatic backers and military suppliers of Iran.¶ Russia is determined to maintain its supplier dominance over European gas markets and is seek­ing to open up investment opportunities for Rus­sian oil and gas companies, most of which are state-owned and flush with cash. It is also seeking to influence Iran to send its gas east through the pro­posed IPI pipeline instead of west through the pro­posed Nabucco gas pipeline, which would compete with Gazprom.¶ Russia is also interested in developing the Rus­sia-proposed north–south energy and trade corri­dor.[7] Both Iran and India have expressed interest in participating in this undertaking, which would connect them to Europe via Russia.[8] ¶ While Russia ostensibly seeks to assist the West in stopping Iran from enriching uranium, it also supports Iran's nuclear program by providing civil­ian nuclear technology, missile expertise, and sur­face-to-air missile systems to protect Iranian nuclear installations. The Kremlin hopes that IPI will mitigate Sino–Russian competition over Central Asian gas and undercut plans for the proposed TAPI pipeline.¶ China has expressed an interest in extending the IPI pipeline into China to obtain additional gas to feed its growing economy. China views Iran as a crit­ical source of oil and gas and as an important node in its strategy to develop more overland energy trans­port routes to reduce its dependence on U.S.-domi­nated sea-lanes.[9] Like Russia, China and Iran are interested in blunting U.S. influence in the region. However, as an oil importer, China shares with the U.S. an interest in stable and lower energy prices.¶ To isolate Iran because of its nuclear program and support for terrorism, the Bush Administration has expressed strong opposition to the proposed pipeline with Iran, which would give Iran an economic lifeline and increase its leverage and influence in South Asia. U.S. policymakers argue that allowing the IPI to proceed will only encourage the Iranian regime to defy the will of the international commu­nity and to continue using terrorism as a foreign pol­icy tool. U.S. opposition to the IPI is aimed at containing Iran and promoting stability and security throughout the Middle East and South Asia.¶ India and Pakistan have other options to fulfill their energy needs that will be more reliable than the IPI. Instead of the IPI, the U.S. should encourage India and Pakistan to expand liquefied natural gas (LNG) imports, focus more on the proposed TAPI pipeline, and deepen cooperation with the U.S. in developing other energy sources, including clean coal, hydroelectric, and civilian nuclear.

#### Also, natty revenues skirt the effectiveness of economic sanctions and directly bankroll Iran’s nuclear program

Cohen & Curtis 8 (Ariel, Senior Research Fellow in Russian and Eurasian Studies and International Energy Security in the Douglas and Sarah Allison Cen­ter for Foreign Policy Studies, a division of the Kathryn and Shelby Cullom Davis Institute for International Studies, and Lisa, Senior Research Fellow for South Asia in the Asian Studies Center; and Owen Graham is a Research Assistant in the Allison Center at The Heritage Foundation, "The Proposed Iran-Pakistan-India Gas Pipeline: An Unacceptable Risk to Regional Security," May 30, [www.heritage.org/research/reports/2008/05/the-proposed-iran-pakistan-india-gas-pipeline-an-unacceptable-risk-to-regional-security], jam)

Iran is an important economic power in the nat­ural gas and petroleum industry, but numerous deficiencies in its oil and gas sector have caused the overall economy to lag far behind its potential and call into question Iran's future as an oil and gas exporter, including its ability to supply gas to Paki­stan and India through the IPI pipeline.¶ Iran has the second-largest gas reserves in the world after Russia and the second-largest petro­leum reserves after Saudi Arabia. Iran has an esti­mated 974 trillion cubic feet in proven gas reserves and 136 billion barrels in proven oil reserves.[35] Oil provides more than 70 percent of Iranian govern­ment revenue.¶ Yet instead of reinvesting this money in the oil and gas sector, the Iranian government has generally spent it on ambitious weapons purchases, its nuclear pro­gram, support for terrorism, and economic subsidies. The Iranian regime is investing only about half of the funds necessary just to maintain hydrocarbon pro­duction, much less to expand production.¶ Iranian exports are declining by 10 percent to 12 percent annually according to a National Acad­emy of Sciences (NAS) study. If current trends con­tinue, Iran's oil exports will drop by half in less than five years and disappear entirely by 2015. This projected decline in production would be the result of a lack of investment in the oil sector and a short­age of natural gas for reinjection (to enhance oil recovery), caused by continuing massive growth in domestic demand for natural gas due to subsidized consumption.[36] ¶ Iran's domestic demand for natural gas is grow­ing by nearly 9 percent annually, while its produc­tion is growing by 4.5 percent per year.[37] Thus, domestic gas demand has increased at the expense of reinjection, accelerating oil depletion rates. Despite its massive gas reserves, Iran has been forced to import 23 mcm per day from Turkmeni­stan. However, on December 31, 2007, Turkmeni­stan stopped daily deliveries of gas, forcing Iran to begin importing from Azerbaijan.[38] ¶ These trends indicate that Iran will be an unreli­able oil and gas supplier and a high political risk. The NAS study concludes that without major changes, Iran will cease to be a net oil exporter by 2014 and will therefore be incapable of supplying gas to Pakistan and India through the IPI.[39]

#### Sanctions and pressure are key to continue blocking prolif

Frenkel 1-28 Sheera Frenkel, “Israel: Iran slowing nuclear program, won’t have bomb before 2015,” McClatchy Newspapers, 1/28/2013, http://www.mcclatchydc.com/2013/01/28/181276/israel-iran-slowing-nuclear-program.html#storylink=cpy

TEL AVIV, Israel — Israeli intelligence officials now estimate that Iran won’t be able to build a nuclear weapon before 2015 or 2016, pushing back by several years previous assessments of Iran’s nuclear ambitions. Intelligence briefings given to McClatchy over the last two months have confirmed that various officials across Israel’s military and political echelons now think it’s unrealistic that Iran could develop a nuclear weapons arsenal before 2015. Others pushed the date back even further, to the winter of 2016. "Previous assessments were built on a set of data that has since shifted," said one Israeli intelligence officer, who spoke to McClatchy only on the condition that he not be identified. He said that in addition to a series of "mishaps" that interrupted work at Iran’s nuclear facilities, Iranian officials appeared to have slowed the program on their own. "We can’t attribute the delays in Iran’s nuclear program to accidents and sabotage alone," he said. "There has not been the run towards a nuclear bomb that some people feared. There is a deliberate slowing on their end." Reports that Iran’s nuclear facility at Fordow had been damaged in a nuclear explosion were still being investigated Monday, Israeli officials said. Satellite imagery shared with McClatchy showed that new fortifications had been built around the perimeter of the facility. "This is already Iran’s most heavily fortified facility," said another intelligence officer, based in Israel’s central command. "The new construction we are seeing here is meant to prevent access to the facility through land routes." He speculated that Iran had taken special care to protect its facilities in Fordow because it was a "highly attractive target for an attack." "Despite repeated efforts by Iran to reinforce and protect their nuclear facilities, there have been accidents that some call sabotage that may have been carried out by a number of interested parties," he said, listing Iranian dissident groups that he said would try to attack Iranian military and nuclear facilities. "One way or another, Iran has been forced to slow down." Writing in Israel’s Hebrew-language daily newspaper Yediot Ahronot, military correspondent Alex Fishman said, "Officials responsible for assessing the state of the Iranian nuclear program, both in the West and in the International Atomic Energy Agency, believe that while the Iranians have continued to pursue their nuclear program, they have been doing so cautiously and slowly, making sure not to cross the point of no return." Fishman wrote that Israel’s allies in the West, including Europe and the United States, had been notified of the new calculations that Iran couldn’t possess nuclear weapons before 2015. That assessment, he said, has been unpopular in Israel’s highest political echelons. Prime Minister Benjamin Netanyahu repeatedly has called 2013 a "decisive year" for Iran’s nuclear program. During his speech at the United Nations General Assembly in September, Netanyahu displayed a rudimentary bomb diagram to illustrate Iran’s progress toward a nuclear weapon. "By next spring, at most next summer, at current enrichment rates, they will have finished the medium enrichment and moved on to the final stage,” Netanyahu said, laying out a timeline for the summer of 2013. “From there it’s only a few months, possibly a few weeks, before they get enough enriched uranium for the first bomb.” Netanyahu, who’s forming his country’s next government despite disappointing results in national elections, has continued to emphasize a sense of urgency on Iran’s nuclear program, citing it first among his new government’s priorities in his election victory speech. Israeli officials, however, have said there’s a widening gulf between Netanyahu’s remarks and the intelligence reports he receives. "There is a question we have to ask ourselves, of ‘Did we cry wolf too early?’ ” the intelligence officer said. An official in Israel’s Foreign Ministry who spoke with McClatchy on the condition of anonymity said that international pressure and sanctions on Iran had made a tremendous difference. "Iran is progressing carefully, and we think that is because of international pressure led by the U.S.," the official said. He added that Israel was very pleased with the tightening of sanctions, especially the recent move to block money that Iran receives for exporting oil to Asian markets. Last week, President Barack Obama signed the latest round of restrictions into law, imposing sanctions against international companies that do business with Iranian firms while blocking Iran from obtaining key materials necessary for its automobile industries.

#### One Iranian nuclear bomb causes extinction

Shavit 12 Ari, A senior correspondent at Haaretz Newspaper and a member of its editorial board and writer for the NY Times. Published by the NY Times “The Bomb and the Bomber” March 12 <http://www.nytimes.com/2012/03/22/opinion/the-bomb-and-the-bomber.html> CUT BY JOHN CLARE FUTURE NATTY CHAMP

*If Iran goes nuclear it will change our world.* An Iranian atom bomb will force Saudi Arabia, Turkey and Egypt to acquire their own atom bombs. Thus a multipolar nuclear arena will be established in the most volatile region on earth. Sooner or later, this unprecedented development will produce a nuclear event. The world we know will cease to be the world we know after Tehran, Riyadh, Cairo or Tel Aviv become the 21st century’s Hiroshima. An Iranian bomb will bring about universal nuclear proliferation. Humanity’s greatest achievement since 1945 was controlling nuclear armament by limiting the number of members in the exclusive nuclear club. This unfair arrangement created a world order that guaranteed relative world peace. But if Iran goes nuclear and the Middle East goes nuclear so will the Third World. If the ayatollahs are allowed to have Robert Oppenheimer’s deadly toy, every emerging power in Asia and Africa will be entitled to have it. The 60-year-old world order that guaranteed world peace will collapse. An Iranian atom bomb will give radical Islam overwhelming influence. Once nuclear, the rising Shiite power will dominate Iraq, the Gulf and international oil prices. It will spread terror, provoke conventional wars and destabilize moderate Arab nations. As Iranian nuclear warheads will jeopardize Israel, they will imperil Europe. For the first time, hundreds of millions of citizens of free societies will live under the shadow of the nuclear might of religious fanatics. The union of ultimate fundamentalism with the ultimate weapon will imbue the world we live in with a hellish undertone. *If Israel strikes Iran it will change our world.* An Israeli attack on Iran’s nuclear facilities will create the most dramatic international crisis of the post-cold war era. As the Jewish state and the Shiite republic exchange blows, the Middle East will be rattled. Tensions will rise between pro-Iranian Russia, China and India and anti-Iranian United States, Britain, France and Germany. As oil prices soar higher (to $250-$300 a barrel), financial markets will panic and the world economy will experience a real setback. An Israeli attack on Iran’s nuclear facilities will unleash a regional war whose consequences might be catastrophic. Iran will strike back with all it has: Hezbollah, Hamas, Shahab missiles, strategic surprises. Iran will block the Strait of Hormuz and call upon all Muslims to come to its rescue. Although most Arab regimes will be secretly supportive of the Israeli operation, the Arab masses might rise. Throughout the world, millions of Muslims will see the attack on Iran as an attack on their own dignity and pride. The religious struggle provoked by the Israeli action might go on for decades. An Israeli attack on Iran’s nuclear facilities might drag the United States into war. Israel has limited air power. Israeli cities are threatened by 200,000 rockets. If an Iranian-led counteroffensive sets Tel Aviv ablaze and kills thousands of Israeli civilians, the U.S. will feel obliged to intervene. Rather than initiate a well-planned and internationally backed American surgical strike on Iran’s nuclear project, America will become captive of an Israeli-Iranian war spiraling out of control. After getting out of the Iraqi mud and while trying to pull out of the Afghan desert, America will be bogged down by a highly charged and highly priced conflict with the Islamic Republic. The pivotal international issue the West has faced in the first 12 years of the 21st century has been Iran. The cardinal strategic challenge of the last decade has been how to prevent two threats: (an Iranian) bomb and (an Israeli) bombing. Yet the West failed to rise to the challenge in time. For years it made every possible mistake. First President George W. Bush focused on Iraq rather than Iran. Then President Barack Obama wasted precious time on idle diplomacy. Britain and France tried their best but the European Union dragged its feet before taking decisive action. The economic sanctions that should have been activated 10 years ago were activated only last year. The crippling sanctions that should have been imposed back in 2005 are yet to be imposed. The assertive-diplomacy track was not seriously pursued when it could have been effective. The creative-political-solution track was never really explored. Western leadership did not endorse a comprehensive, resourceful, consistent and tough third-way-strategy that could prevent Bomb and Bombing. Now we are witnessing a shift. Terrified by the prospect of an imminent Israeli strike, decision makers and opinion leaders in the United States and Europe have Iran on their mind. Last week Tehran was cut off from the SWIFT bank-transfer network. By July, all E.U. nations will stop purchasing Iranian oil. Yet all this is too little too late. Within nine months the Iranians will be immune to an Israeli air strike. By Christmas, Israel will lose the military capability to stop the Shiite bomb. As it will be existentially threatened, the Jewish State will feel obliged to take action. So the summer of 2012 now seems to be the summer of last opportunity. If in the coming months crippling sanctions are not imposed on Iran and Israel doesn’t get substantial guarantees that will ensure its future, anything might happen. All hell might break loose. If the West doesn’t get its act together at this very last moment, it might soon face the dire consequences of its own impotence.

#### Scenario 2 is Strait of Hormuz closure

#### High risk now

Cordesman 1/22 (Anthony H., holds the Arleigh A. Burke Chair in Strategy at CSIS, recipient of the Department of Defense Distinguished Service Medal, Bryan Gold, CSIS, Bradley Bosserman, CSIS, Sam Khazai, CSIS, "U.S. and Iranian Strategic Competition: Sanctions, Energy, Arms Control, and Regime Change," 2013, [csis.org/publication/us-and-iranian-strategic-competition-sanctions-energy-arms-control-and-regime-change], jam)

The report provides an in-depth analysis of US and Iranian competition focusing on four interrelated areas - sanctions, energy, arms control, and regime change. It shows this competition has been steadily building since the fall of 2011, when the IAEA issued a new report on the possible military applications of Iran’s nuclear program. Iran has continued to issue threats to “close the Gulf,” and has stalled negotiations, spurring a renewed round of sanctions that have had an increasingly significant impact on Iran’s economy throughout 2012 and continuing into 2013.¶ The report also shows this competition takes place at levels ranging from the bilateral to the multilateral, and encompasses the UN, EU, US, and IAEA. The patterns in this competition have become extremely complex; in practice the patterns of interaction between each form of competition have acquired a cyclical consistency that seems likely to go on indefinitely into the future.¶ The US has applied a wide range of sanctions on Iranian banks; targeting Iranian companies involved in the nuclear, petrochemical, and oil industries, as well as non-Iranian companies that have invested or have been involved with Iran’s petrochemical industries, arms industries, transport, and precious metal trafficking. To further apply pressure on Iran, the US has led efforts to strengthen Southern Gulf military forces and deterrent capabilities. The EU has joined the US by sharply increasing its role in sanctioning Iran by imposing an embargo on Iranian petrochemical imports and banning European investment in Iran’s petrochemical industry, cutting Iran out of the international banking system, and banning insurance agreements and loans.¶ It is not clear that these pressures and sanctions can succeed in altering Iranian nuclear ambitions or bringing stability to US and Iranian competition over nuclear weapons and security in the region. It is clear, however, that the push toward enhancing sanctions and growing international isolation is having a real impact on the Iranian economy. Iran’s recent actions also indicate that new sanctions and international – as well as internal – pressure is having serious effects.¶ There is some historical evidence that Iran responds pragmatically when the costs of its actions become too high. Iran’s steadily more divisive internal politics also offer some hope that a more moderate and less hostile regime may eventually emerge. The US, Britain, France, Germany, and other allies should continue to push hard to contain and isolate Iran while attempting to extract concessions and weaken the regime’s nuclear efforts.¶ But the push toward enhanced sanctions and growing international isolation of Iran may also push Tehran towards new strategic options. Iran’s threats to close the Strait of Hormuz and conspicuous missile testing are evidence that it may react to pressure in ways that lead to prolonged confrontation. Tehran may see military threats, exercises, and pressures on world oil prices as a possible way of easing sanctions and/or buying time for its nuclear and missile programs. ¶ Progress in negotiations is uncertain at best, the P5+1 negotiations that took place in 2012 did offer some hope for a peaceful resolution, but while the two sides did meet, an agreement was not reached. Iran has recently declared its willingness to again attempt negotiations, but it is unclear when they will take place. Unfortunately, history warns that Iran’s negotiating efforts may be little more than yet another round of Iranian negotiate and delay tactics and is a familiar part of the US-Iranian strategic relationship.

#### Spikes oil prices

Krauss 12 (Clifford, NYT, "Oil Price Would Skyrocket if Iran Closed the Strait of Hormuz," Jan 4, [www.nytimes.com/2012/01/05/business/oil-price-would-skyrocket-if-iran-closed-the-strait.html], jam)

HOUSTON — If Iran were to follow through with its threat to blockade the Strait of Hormuz, a vital transit route for almost one-fifth of the oil traded globally, the impact would be immediate: Energy analysts say the price of oil would start to soar and could rise 50 percent or more within days.¶ An Iranian blockade by means of mining, airstrikes or sabotage is logistically well within Tehran’s military capabilities. But despite rising tensions with the West, including a tentative ban on European imports of Iranian oil announced Wednesday, Iran is unlikely to take such hostile action, according to most Middle East political experts.¶ United States officials say the Navy’s Fifth Fleet, based in nearby Bahrain, stands ready to defend the shipping route and, if necessary, retaliate militarily against Iran.¶ Iran’s own shaky economy relies on exporting at least two million barrels of oil a day through the strait, which is the only sea route from the Persian Gulf and “the world’s most important oil choke point,” according to Energy Department analysts.¶ A blockade would also punish China, Iran’s most important oil customer and a major recipient of Persian Gulf oil. China has invested heavily in Iranian oil fields and has opposed Western efforts to sanction Iran over its nuclear program.¶ Despite such deterrents to armed confrontation, oil and foreign policy analysts say a miscalculation is possible that could cause an overreaction from one side or the other.¶ “I fear we may be blundering toward a crisis nobody wants,” said Helima Croft, senior geopolitical strategist at Barclays Capital. “There is a peril of engaging in brinkmanship from all sides.”¶ Various Iranian officials in recent weeks have said they would blockade the strait, which is only 21 miles wide at its narrowest point, if the United States and Europe imposed a tight oil embargo on their country in an effort to thwart its development of nuclear weapons.¶ That did not stop President Obama from signing legislation last weekend imposing sanctions against Iran’s Central Bank intended to make it more difficult for the country to sell its oil, nor did it dissuade the European Union from moving toward a ban on Iranian oil imports.¶ Energy analysts say even a partial blockage of the Strait of Hormuz could raise the world price of oil within days by $50 a barrel or more, and that would quickly push the price of a gallon of regular gasoline to well over $4 a gallon. “You would get an international reaction that would not only be high, but irrationally high,” said Lawrence J. Goldstein, a director of the Energy Policy Research Foundation.¶ Just the threat of such a development has helped keep oil prices above $100 a barrel in recent weeks despite a return of Libyan oil to world markets, worries of a European economic downturn and weakening American gasoline demand. Oil prices rose slightly on Wednesday as the political tensions intensified.¶ American officials have warned Iran against violating international laws that protect commercial shipping in international waters, adding that the Navy would guarantee free sea traffic.¶ “If the Iranians chose to use their modest navy and antiship missiles to attack allied forces, they would see a probable swift devastation of their naval capability,” said David L. Goldwyn, former State Department coordinator for international energy affairs. “We would take out their frigates.”¶ More than 85 percent of the oil and most of the natural gas that flows through the strait goes to China, Japan, India, South Korea and other Asian nations. But a blockade would have a ripple effect on global oil prices.¶ Since Iraq, Kuwait, Saudi Arabia, Qatar and the United Arab Emirates all rely on the strait to ship their oil and natural gas exports, a blockade might undermine some of those governments in an already unstable region.¶ Analysts say that a crisis over the Strait of Hormuz would most likely bring China and the United States into something of an alliance to restore shipments, although Mr. Goldwyn said China would more likely resort to private diplomacy instead of military force.¶ Europe and the United States would probably feel the least direct impact because they have strategic oil reserves and could get some Persian Gulf oil through Red Sea pipelines. Saudi Arabia has pipelines that could transport about five million barrels out of the region, while Iraq and the United Arab Emirates also have pipelines with large capacities.¶ But transportation costs would be higher if the strait were blocked, and several million barrels of oil exports would remain stranded, sending energy prices soaring on global markets.¶ “To close the Strait of Hormuz would be an act of war against the whole world,” said Sadad Ibrahim Al-Husseini, former head of exploration and development at Saudi Aramco. “You just can’t play with the global economy and assume that nobody is going to react.”¶ The Iranians have struck in the strait before. In the 1980s, Iran attacked Kuwaiti tankers carrying Iraqi oil, and the Reagan administration reflagged Kuwaiti ships under American flags and escorted them with American warships. Iran backed down, partially, but continued to plant mines.¶ In 1988, an American frigate hit an Iranian mine and nearly sank. United States warships retaliated by destroying some Iranian oil platforms. Attacks and counterattacks continued for months, and a missile from an American warship accidentally shot down an Iranian passenger aircraft, killing 290 passengers.¶ Energy experts say a crisis in the strait would most likely unfold gradually, with Iran using its threats as a way to increase oil prices and shipping costs for the West as retaliation against the tightening of sanctions. So far, energy experts say, insurance companies have not raised prices for covering tankers, but shipping companies are already preparing to pay bonuses for crews facing more hazardous duties.¶ “My guess is this is a lot of threats,” said Michael A. Levi, an energy expert at the Council on Foreign Relations, “but there is no certainty in this kind of situation.”

#### Oil shocks collapse the global economy – whatchu know bout stagflation?

Roubini et al 4 (Nouriel, Stern School of Business, NYU, Brad Sester, Research Associate, Global Economic Governance Programme, University College, Oxford, "The effects of the recent oil price shock on the U.S. and global economy," August, [pages.stern.nyu.edu/~nroubini/papers/OilShockRoubiniSetser.pdf], jam)

Oil prices shocks have a stagflationary effect on the macroeconomy of an oil importing ¶ country: they slow down the rate of growth (and may even reduce the level of output – ¶ i.e. cause a recession) and they lead to an increase in the price level and potentially an ¶ increase in the inflation rate. An oil price hike acts like a tax on consumption and, for a ¶ net oil importer like the United States, the benefits of the tax go to major oil producers ¶ rather than the U.S. government. ¶ The impact on growth and prices of an oil shock depends on many factors: ¶ - The size of the shock, both in terms of the new real price of oil and the percentage ¶ increase in oil prices. At its close of $43 a barrel on July 30, 2004, the current ¶ real price of oil is high – well above the levels during the 1990 and 2000 oil minishocks, but it remains well below the peak real oil price of $82 in 1980, and equal ¶ to the post 73 real price of $43. The recent 65% increase in oil prices (since the ¶ 2002 average price)¶ 3¶ is comparable to the increase in 2000 (60%, but from a very ¶ low starting point, as oil prices had fallen to a low of around $15 in 1999), higher ¶ than the increase in 1990 (40%), but much smaller than the increases in 1973 ¶ (210%) and 1979-80 (135%). ¶ - The shock’s persistence. This will depend on many things, many as much ¶ political as economic, since the current high oil price reflects both booming Asian ¶ demand (China alone is expected to account for roughly 40% of the increase in ¶ demand for oil in 2004) and geopolitical risk in the Middle East (the “fear ¶ premium” estimated to add between $4 and $8 to current prices). ¶ - The dependency of the economy on oil and energy. The U.S. economy is much ¶ less energy intensive than it was in the 1970s, but it also much bigger and ¶ produces comparatively less domestic oil. Net oil imports of 1.2% of GDP in ¶ 2003 are higher than net oil imports of 0.9% of GDP in 1970. ¶ - The policy response of monetary and fiscal authorities ¶ These effects are not trivial: oil shocks have caused and/or contributed to each one of the ¶ US and global recessions of the last thirty years. Yet while recent recessions have all ¶ been linked to an increase in the price of oil, not all oil price spikes lead to a recession. ¶ The 2003 spike associated with the invasion of Iraq is a good example. ¶ Private sector estimates generally suggest that a persistent 10% increase in the price of oil ¶ – say an increase from $30 to an average of $35 over the course of 2004 -- would reduce ¶ the US and the G7 growth rate by about 0.3%-0.4% within a year. Some (Goldman¶ Sachs) are more pessimistic, and calculate that if oil prices were to increase further to ¶ levels closer to $45, the reduction in the G7 growth rate may be closer to 1% of GDP. ¶ Thus, private estimates of the negative effects of an oil shock currently range between ¶ 0.3% to 1% of US and G7 GDP growth. This means that the US economy, which was ¶ growing in Q4:2003 and Q1:2004 at about a 4.3% average rate could be expected to see a ¶ slowdown of its growth to a level between 4.0% and 3.3%. Global growth would also ¶ de-accelerate from its current very strong pace. And, indeed, the first estimate for ¶ Q2:2004 U.S. GDP growth was 3.0%, confirming that high oil prices in the first half of ¶ 2004 put a dent on real consumer demand. Looking ahead, persistence of oil prices at ¶ recent high levels of $43-44 per barrel (or even higher prices) could further slow down ¶ the U.S. economy below a 3% growth rate. ¶ However, there are several reasons to worry that the current oil price shock may have ¶ larger growth effects than currently expected by most economists: ¶ • Most forecasters did not expect the 2000 shock to lead to a recession, yet it clearly ¶ contributed to the resulting slowdown. While current oil prices are high mostly as ¶ a result of booming global demand, not a fall in supply, high oil prices stemming ¶ from a booming Asia have a similar impact on the U.S. as high oil prices that ¶ arise from limits on supply. ¶ • The tight oil market gives market power to Saudi Arabia, which is the only ¶ producer with significant spare capacity. It also makes the world extremely ¶ vulnerable to any major interruptions in supply. Major price spikes -- like that of ¶ 1973 -- happen when supplies are already tight. On the other hand, oil consuming ¶ nations do hold larger strategic stockpiles now than in 1973, providing some ¶ protection against supply disruption. ¶ • Other financial vulnerabilities may exacerbate the output effects of an oil shock. ¶ Financial markets are quite unsettled, as market players are trying to reposition ¶ themselves ahead of the Fed’s anticipated tightening and are taking off the carry ¶ trades they put on to profit from extremely low U.S. interest rates. ¶ • The U.S. economy has other sources of vulnerability as well. U.S. consumers are ¶ by many measures already overstretched: consumption growth has been spurred ¶ by borrowing in the face of stagnant real incomes for many wage earners. High ¶ oil prices might dent their confidence. Recent data suggests that a slowdown in ¶ consumer spending linked in part to higher oil prices accounted for the fall in the ¶ pace of U.S. growth in the second quarter of 2004. ¶ • The Fed also has less room to direct monetary solely toward policy to maintaining ¶ output than it did in 2000: unlike in 2000, when inflation was falling, inflation ¶ was already picking up in 2004 - admittedly from a very low level - prior to the ¶ recent surge in oil prices; and recent inflation news have shown a worrisome pickup in the inflation rate. The combination of low pre-existing rates, a weak dollar ¶ and high oil prices limit the Fed’s ability to maneuver. With some concerned that ¶ the Fed is already “behind the curve” in terms of responding to the recent inflation ¶ increase, the Fed would have to increased the Fed Funds rate more and faster than ¶ currently expected by the markets if further oil price shocks were to feed into the ¶ inflation rate. • Finally, markets are concerned about the size and pace of the Chinese slowdown ¶ following a period of unsustainable overheating. While a slowdown in China ¶ would reduce demand driven pressures on oil and likely would lead to lower ¶ prices barring any changes in supply, it also would remove one of the main ¶ engines of world growth. ¶ All these factors add to the downside risks and may lead to a more severe growth ¶ slowdown following the recent oil price shock.

#### Economic collapse causes global wars

Royal ‘10 director of Cooperative Threat Reduction at the U.S. Department of Defense (Jedediah, Economics of War and Peace: Economic, Legal, and Political Perspectives, pg 213-215)

Less intuitive is how periods of economic decline may increase the likelihood of external conflict. Political science literature has contributed a moderate degree of attention to the impact of economic decline and the security and defence behaviour of interdependent stales. Research in this vein has been considered at systemic, dyadic and national levels. Several notable contributions follow. First, on the systemic level. Pollins (20081 advances Modclski and Thompson's (1996) work on leadership cycle theory, finding that rhythms in the global economy are associated with the rise and fall of a pre-eminent power and the often bloody transition from one pre-eminent leader to the next. As such, exogenous shocks such as economic crises could usher in a redistribution of relative power (see also Gilpin. 19SJ) that leads to uncertainty about power balances, increasing the risk of miscalculation (Fcaron. 1995). Alternatively, even a relatively certain redistribution of power could lead to a permissive environment for conflict as a rising power may seek to challenge a declining power (Werner. 1999). Separately. Pollins (1996) also shows that global economic cycles combined with parallel leadership cycles impact the likelihood of conflict among major, medium and small powers, although he suggests that the causes and connections between global economic conditions and security conditions remain unknown. Second, on a dyadic level. Copeland's (1996. 2000) theory of trade expectations suggests that 'future expectation of trade' is a significant variable in understanding economic conditions and security behaviour of states. He argues that interdependent states are likely to gain pacific benefits from trade so long as they have an optimistic view of future trade relations. However, if the expectations of future trade decline, particularly for difficult to replace items such as energy resources, the likelihood for conflict increases, as states will be inclined to use force to gain access to those resources. Crises could potentially be the trigger for decreased trade expectations either on its own or because it triggers protectionist moves by interdependent states.4 Third, others have considered the link between economic decline and external armed conflict at a national level. Momberg and Hess (2002) find a strong correlation between internal conflict and external conflict, particularly during periods of economic downturn. They write. The linkage, between internal and external conflict and prosperity are strong and mutually reinforcing. Economic conflict lends to spawn internal conflict, which in turn returns the favour. Moreover, the presence of a recession tends to amplify the extent to which international and external conflicts self-reinforce each other (Hlomhen? & Hess. 2(102. p. X9> Economic decline has also been linked with an increase in the likelihood of terrorism (Blombcrg. Hess. & Wee ra pan a, 2004). which has the capacity to spill across borders and lead to external tensions. Furthermore, crises generally reduce the popularity of a sitting government. "Diversionary theory" suggests that, when facing unpopularity arising from economic decline, sitting governments have increased incentives to fabricate external military conflicts to create a 'rally around the flag' effect. Wang (1996), DcRoucn (1995), and Blombcrg. Hess, and Thacker (2006) find supporting evidence showing that economic decline and use of force arc at least indirecti) correlated. Gelpi (1997). Miller (1999). and Kisangani and Pickering (2009) suggest that Ihe tendency towards diversionary tactics arc greater for democratic states than autocratic states, due to the fact that democratic leaders are generally more susceptible to being removed from office due to lack of domestic support. DeRouen (2000) has provided evidence showing that periods of weak economic performance in the United States, and thus weak Presidential popularity, are statistically linked lo an increase in the use of force. In summary, rcccni economic scholarship positively correlates economic integration with an increase in the frequency of economic crises, whereas political science scholarship links economic decline with external conflict al systemic, dyadic and national levels.' This implied connection between integration, crises and armed conflict has not featured prominently in the economic-security debate and deserves more attention.

#### Killing the IPI prevents it

Cohen & Curtis 8 (Ariel, Senior Research Fellow in Russian and Eurasian Studies and International Energy Security in the Douglas and Sarah Allison Cen­ter for Foreign Policy Studies, a division of the Kathryn and Shelby Cullom Davis Institute for International Studies, and Lisa, Senior Research Fellow for South Asia in the Asian Studies Center; and Owen Graham is a Research Assistant in the Allison Center at The Heritage Foundation, "The Proposed Iran-Pakistan-India Gas Pipeline: An Unacceptable Risk to Regional Security," May 30, [www.heritage.org/research/reports/2008/05/the-proposed-iran-pakistan-india-gas-pipeline-an-unacceptable-risk-to-regional-security], jam)

Finally, by forgoing the IPI pipeline and thus constraining Iran's overland export capability, India and Pakistan would make the Iranian regime more dependent on sea exports through the Strait of Hormuz. As the second-largest gasoline importer after the United States, Iran is already dependent on seaborne imports for 40 percent of its fuel needs.[70] This dependence stems from its reliance on its tanker fleet's access to international mar­kets.[71] Blocking the overland option may increase Iran's interest in promoting stability in this extremely important chokepoint.

### 2

#### INDIAN ENERGY ADVANTAGE

#### India is competing for LNG imports – key to growth

Reuters ‘11 (This date was straight up fabricated, can’t find the date, [http://www.deccanherald.com/content/164939/indias-future-lies-liquified-natural.html], jam)

Imports of liquefied natural gas (LNG) by India will soar in the next decade to fuel an expanding economy, pitting India against China and Japan for supplies as it domestic gas output struggles and overland delivery remains a dream. India’s trillion-dollar economy is already one of world’s largest importers of LNG. “The rapid increase in LNG demand from Japan will limit the ability of emerging markets such as India to source LNG,” Bank of America Merrill Lynch Head Fransisco Blanch said. The extra supplies that India needs are more likely to come from Qatar and Australia, experts said. Qatar already supplies India on long-term contracts. While buyers often complain of the link with expensive oil in long-term Asian contracts for liquefied natural gas, India will have no choice but to sign up quickly if it wants to avoid being beaten to the supply by Japan and China. Competition for supply is likely to be intense. Japanese companies have had to increase imports to fuel gas generators after shutting down nuclear power generation capacity after the earthquake and tsunami. China’s imports are expected to rise about fivefold, to 46 million tonnes it imported in 2020 from about 9 million tonnes in 2010. Indian buyers have already had to outbid Japan for spot, or immediate delivery, shipments of LNG from Qatar. With costs rising for already pricey Australian LNG projects, holding off on securing of long-term supply deals could end up costing Indian buyers. “For many years, Indian companies have held back from signing long-term contracts, hoping to get a better price for LNG” PFC Energy’s energy analyst Natalie Bravo said. “But in retrospect, this strategy is going to prove costly.” Signing long-term deals now would ensure more profitable operations for importers of LNG, who are planning to build expensive import facilities, said Amitava Sengupta, former head of Petronet, largest importer of LNG in the country. “Indian companies should definitely go for midterm, 10 to 15 year LNG contracts,” he said. By 2020, with galloping economic growth of about 8 per cent increasingly attractive against coal and oil, which produce heavier carbon emissions, India could need twice as much natural gas as it consumes now. The gulf between domestic demand and supply is widening. Hopes, for a hefty contribution to meet demand earlier this year when Reliance Industries acknowledged that production was slipping at its D6 field. Lacklustre domestic exploration results give little reason to expect a turnaround at home. Geopolitical hurdles to pipeline supplies through fractious neighbours like Iran, Pakistan and Afghanistan have made LNG only serious source of supplies. To cope with rising imports, India plans to spend billions to increase the capacity of import terminals for LNG to 26 million tonnes per year from from 13.7 million. Existing terminals are operated by Petronet and Royal Dutch Shell. India’s pipeline network would need an overhaul and expansion to get the gas to market, work that would require an investment of as much as Rs 350 billion, GAIL Chairman B C Tripathi.

#### Indian energy demand has forced policymakers into a fundamentally unsustainable acquisition strategy – precipitates conflict with Pakistan, China, and Maoist insurgents which will collapse Indian political stability

Kugelman 11 (Michael, senior program associate for South and Southeast Asia at the Woodrow Wilson Center, M.A., International Relations, The Fletcher School, Tufts University, "Integrating Energy Concerns into India's National Security Strategy," Dec 14, Journal of Energy Security, [www.ensec.org/index.php?option=com\_content&view=article&id=334:integrating-energy-concerns-into-indias-national-security-strategy&catid=121:contentenergysecurity1111&Itemid=386], jam)

India’s externally oriented energy security strategy holds troubling implications for national security. First, with many of its prized energy assets (and the sea-lanes needed to convey them back home) situated in volatile regions, Indian nationals – from overseas-based NOGC staff to seamen transporting energy supplies – operate under dangerous conditions. The Middle East – convulsed by uprisings and violence in 2011 – houses Indian hydrocarbon blocks from Egypt and Iran to Syria and Yemen. Indian energy trade must navigate the piracy-choked coast of Somalia. And war in Afghanistan and perennial unrest in Pakistan will pose security risks for Indians involved with the envisioned Trans-Afghanistan (TAPI) pipeline, which, if ever constructed, will pass through both of those nations. Second, India’s race for overseas energy resources brings it into close competition with China. The latter, which is already embroiled in a border conflict with India, often angers New Delhi with its aggressive efforts to acquire oil and gas reserves in and around the Indian Ocean Region (IOR), which India regards as its backyard. Some Indians believe that such activities constitute part of a Chinese “string of pearls” strategy, meant to encircle India from East Africa to Burma and the Bay of Bengal. India makes little secret of the fact that its current military modernization is driven by a desire to accelerate efforts to keep up with China’s own modernizing trend. Critically, even the more modest internally oriented elements of India’s energy security policies endanger national security. For instance, India is blessed with ample hydropower resources in Kashmir. With economic growth and energy demand soaring, the nation has increased its development of hydro dams along the western rivers of the Indus Basin. This policy enhances energy security but adds to tensions with neighboring Pakistan, where the anti-India militant group Lashkar-e-Taiba (LeT) routinely accuses India of “water theft” and threatens to retaliate with violence. Additionally, one of the rallying cries of the summer 2010 uprising in Jammu and Kashmir revolved around the perception that India’s state-owned hydro companies were not allocating sufficient electricity to energy-starved locals. Meanwhile, sizable quantities of India’s coal reserves are located in the central and eastern portions of the country that serve as the bastions of a virulent Maoist insurgency. This has implications for both access and security. On the one hand, it is difficult to extract these reserves. On the other hand, when coal is excavated from these areas, locals are often displaced and living conditions become toxic. In so doing, New Delhi and the nation’s powerful mining corporations fan the flames of the insurgency, which India’s top leadership repeatedly describes as the country’s gravest internal security threat. The great significance of political instability in India’s coal-rich areas cannot be emphasized enough. Coal constitutes the majority resource in India’s energy mix (53%), and about 70% of the country’s electricity generation occurs in coal-fired power plants. In India, no indigenous energy resource occurs in greater supply than coal (in fact, only two countries produce more coal than India does). If access to coal is jeopardized in India, the country’s energy security is immediately imperiled.

#### Sino-India war escalates to nuclear war

Mazza & Blumenthal 11 (Michael, M.A., international relations (strategic studies and international economics), Paul H. Nitze School of Advanced International Studies (SAIS), Johns Hopkins University, and Dan, M.A., School of Advanced International Studies, Johns Hopkins University, Apr 6, [http://www.npolicy.org/article.php?aid=813&tid=30] AD: 8-8-11, jam)

The Sino-Indian nuclear relationship is, however, much more complicated. India is China’s tenth largest trading partner and China is India’s largest. From an economic perspective, it would appear that Asia’s two giants have an interest in maintaining friendly, peaceful relations. Still, Beijing and Delhi have a long history of distrust and incompatible strategic interests. The most obvious areas of tension are the ongoing border disputes and China’s close military relations with Pakistan—Beijing has provided assistance to Islamabad in its nuclear weapons and ballistic missile programs. Additionally, with its “look east” policy, Delhi aims to increase its reach into an area considered by China to be its own sphere of influence; the reverse is true for China’s “string of pearls” strategy, through which it is increasing its presence in the Indian Ocean and leaving India feeling encircled. Perhaps more than any other region in the Asia-Pacific, South Asia has great potential for an arms race and for explosive conflict. India has shown remarkable restraint in response to terror attacks emanating from Pakistan in recent years, though things could spiral downhill very quickly. And even though both India has strategic weapons, that has not kept China from provoking Delhi, especially in recent years. References to China’s victory in the 1962 war have appeared much more frequently in official Chinese statements, some Chinese officials have laid claim to sovereignty over all of Arunachal Pradesh—or “Southern Tibet”—and PLA forces have crossed the line of actual control and destroyed Indian military bunkers and outposts. 17 Tibet—now reportedly home to nuclear weapons targeted on India 18 —is also a flashpoint. India is home to the Dalai Lama and the Tibetan government-in-exile and to this day recognizes only Chinese suzerainty (rather than sovereignty) over Tibet. Some of Tibet’s holiest sites are in Indian territory and the Chinese fear that the Dalai Lama may name a successor somewhere outside of China. According to India scholar Dan Twining, “some Indian strategists fear that China may act to preempt, or respond to, an announcement of the Dalai Lama’s chosen successor in India…by deploying the People’s Liberation Army to occupy contested territory along the Sino-Indian border.” 19 Chinese officials often list Tibetan separatism as one of China’s top three threats, so Beijing may have an itchy trigger finger (on its conventional forces) when it comes to ensuring security on the Tibetan plateau. Though China certainly does not want a war with India at this time, it seems like Beijing does not necessarily fear one either—and that’s a frightening thought, given the nuclear component of the relationship. And though both countries at the moment maintain NFU pledges and have relatively small arsenals, these arsenals are likely to grow. As China modernizes its nuclear force and potentially changes its nuclear doctrine to meet the needs of deterring America, India will need to respond to China’s build-up, which will have a domino affect on Pakistan’s nuclear forces as well. Similar logic applies to conventional build-ups. And while China must now consider its economic relationship with India when providing (conventional) arms to Pakistan, Beijing’s strategic logic has not changed all that much since the days of the Cold War—India presents a threat to China’s sovereignty and territorial integrity (and economy, given that it sits astride key shipping lanes). Arming Pakistan complicates India’s strategic environment and forces Delhi to divide its attention. As China modernizes its conventional and strategic arsenals and develops its own missile defense system, it will pose a greater and more varied threat to India. In turn, India may believe it necessary to adjust its own nuclear doctrine. Moreover, given the apparent change in India’s strategic thinking as it prepares for a potential two-front war against both Pakistan and China, Delhi may in the future rely more heavily on its strategic weapons if it fails to develop conventional forces sufficient to deal with both foes at once. All of this is to say that the nuclear balance in South Asia may soon enter a period of flux, with potentially destabilizing consequences for the region.

#### Indo-Pak war rapidly escalates, causes nuclear winter

Hundley ’12 Tom Hundley, senior editor at the Pulitzer Center on Crisis Reporting, MA in International Relations from Penn, and professor of Communication at the American University in Dubai. “Race to the end: Pakistan’s terrible, horrible, no-good very bad idea to develop battlefield nukes.” Foreign Policy 9/5/12 <http://www.foreignpolicy.com/articles/2012/09/05/race_to_the_end?page=full> wg

The arms race could make a loose nuke more likely. After all, Pakistan's assurances that its nuclear arsenal is safe and secure rest heavily on the argument that its warheads and their delivery systems have been uncoupled and stored separately in heavily guarded facilities. It would be very difficult for a group of mutinous officers to assemble the necessary protocols for a launch and well nigh impossible for a band of terrorists to do so. But that calculus changes with the deployment of mobile battlefield weapons. The weapons themselves, no longer stored in heavily guarded bunkers, would be far more exposed.¶ Nevertheless, military analysts from both countries still say that a nuclear exchange triggered by miscalculation, miscommunication, or panic is far more likely than terrorists stealing a weapon -- and, significantly, that the odds of such an exchange increase with the deployment of battlefield nukes. As these ready-to-use weapons are maneuvered closer to enemy lines, the chain of command and control would be stretched and more authority necessarily delegated to field officers. And, if they have weapons designed to repel a conventional attack, there is obviously a reasonable chance they will use them for that purpose. "It lowers the threshold," said Hoodbhoy. "The idea that tactical nukes could be used against Indian tanks on Pakistan's territory creates the kind of atmosphere that greatly shortens the distance to apocalypse."¶ Both sides speak of the possibility of a limited nuclear war. But even those who speak in these terms seem to understand that this is fantasy -- that once started, a nuclear exchange would be almost impossible to limit or contain. "The only move that you have control over is your first move; you have no control over the nth move in a nuclear exchange," said Carnegie's Tellis. The first launch would create hysteria; communication lines would break down, and events would rapidly cascade out of control. Some of the world's most densely populated cities could find themselves under nuclear attack, and an estimated 20 million people could die almost immediately.¶ What's more, the resulting firestorms would put 5 million to 7 million metric tons of smoke into the upper atmosphere, according to a new model developed by climate scientists at Rutgers University and the University of Colorado. Within weeks, skies around the world would be permanently overcast, and the condition vividly described by Carl Sagan as "nuclear winter" would be upon us. The darkness would likely last about a decade. The Earth's temperature would drop, agriculture around the globe would collapse, and a billion or more humans who already live on the margins of subsistence could starve.

#### Maoists will win – causes widespread political instability

Vira 11 (Varun, writes on Middle Eastern and South Asian security affairs, coauthored *Pakistan: Violence vs. Stability* with Dr. Anthony Cordesman of the Center for Strategic and International Studies, pursuing an M.A. in international relations at George Washington University, has written for the Program for Culture and Conflict Studies at the Naval Postgraduate School, National Defense University’s Joint Forces Quarterly, the Diplomat, and the Diplomatic Courier, "Counterinsurgency in India: The Maoists," Dec 7, [smallwarsjournal.com/jrnl/art/counterinsurgency-in-india-the-maoists], jam)

India’s Prime Minister identifies the Maoist (or “Naxalite”) insurgency as India’s “single biggest internal security challenge.” The insurgency is today severe in scale and violence with 2,212 violent incidents in 2010 causing 1,175 casualties (713 civilian, 285 security force and 171 guerilla), a 63% increase since 2008.[i] Today, about 10,000 – 40,000 full-time insurgents wage a protracted peoples war to overthrow the Indian state across a vast “Red Corridor,” affecting 20 of India’s 28 states. India is currently waging a large-scale counterinsurgency campaign against the Maoists, deploying 70,000 paramilitary police in November 2009, many to the insurgent heartland in Jharkhand and Chhattisgarh, where 50 percent of all attacks were recorded in 2010.[ii] The Maoists benefit from “two Indias living side by side.”[iii] India is rapidly modernizing, but many inequalities are also widening – between rich and poor, town and country and upper and lower castes. Conditions for large swathes of rural India still compare with the worst of sub-Saharan Africa, and in many remote areas the state has long been absent. However, economic grievances alone do not correlate with Maoism, and in net terms, the Indian state has tremendous internal legitimacy – only 26 of India’s 100 poorest districts, and 20 of its 100 most illiterate are Maoist afflicted.[iv] In truth, Maoist legitimacy is restricted to the extreme end of India’s deprivation scale – amongst the adivasis (tribals) and dalits (“untouchables”) – where in addition to extreme human misery, a broader set of social and status grievances are being inflamed. Analyst Eric Randolph astutely noted on the issue that, “People can put up with a great deal of structural violence in their lives […] particularly when it is all they have known. Instead, what tends to trigger acts of violent rebellion are specific flashpoints of injustice.”[v] For the adivasis and tribals, there are plenty such flashpoints. India’s tribals – in particular the Gonds of Central India[vi] – are under intense assault from state and private corporate interests, and are being pushed off their forestlands by giant hydro, logging and mining projects for little compensation and rehabilitation. The dalits, already the bottom rung of landless agricultural farmers, are similarly disproportionately impacted by the tumultuous changes of modernization on the Indian countryside, and discriminated against daily despite legislation. Tribals make up the core fighting strength of the Maoist insurgency – their narrow eight percent share of the population is still sizeable given India’s 1.2 billion peoples. The Maoist insurgency follows on a long history of peasant and tribal rebellion against predatory state structures on the subcontinent. It originated in its present form in a small village in Naxalbari, West Bengal, where in 1967, villagers armed with bows and arrows resisted police and feudal landlords with bows and arrows.[vii] The incident galvanized the Indian Communist movement, which found a fertile audience for its Chinese-inspired Maoist rhetoric of land reform and overthrow of feudal class structures. Militant Communism has since waxed and waned for the past half century, crushed by security forces and de-legitimized by the Indo-Chinese War of 1962, but the current phase of escalation is the strongest and most violent in history. In 2004, the two largest insurgent groups – the People’s War Group and the Maoist Communist Center – merged to form the new Communist Party of India Maoist (CPI-M). The merger elevated security hardliners in insurgent command, reiterated their commitment to violent and large-scale “peoples war,” and immediately increased insurgent kinetic activity. Today, the CPI-M accounts for 90% of attacks and 95% of fatalities from “left-wing terrorism,” according to the Indian Home Ministry.[viii] Maoist insurgents are tactically effective and intimately familiar with their jungle terrain. They employ classic guerilla tactics, dispersing in the face of organized force and prioritize their links with the population –often through violent intimidation. Their dispersed organizational structure mitigates the risk of being decisively impacted by targeted counterinsurgent (CI) operations. Local cells have tremendous autonomy, reflected in the fact that since 2007, six of the fourteen members of the Politburo, the highest echelon of insurgent command, have been arrested, to little discernible impact in the field.[ix] Unusual in COIN campaigns, Maoist guerillas have the tactical advantage over Indian security forces, and have demonstrated the ability to conduct sophisticated large-scale operations. Insurgents assault training centers and police stations to capture weaponry, attack jails to break out captured comrades and target judges and state functionaries to weaken state presence. Their lethality has grown with the use of IEDs, which now result in the majority of CI casualties. Despite a total lack of external support, the Maoists have ready access to funding – territories under their control are resource-rich and the insurgents maintain an extensive and lucrative extortion network that may net them as much as 14 billion rupees ($300 million) annually.[x] Part of the insurgent “tax” is explosives used in the mining sector, which companies are often in no position to refuse.[xi] A Military-Centric Response India has grown acutely aware of the Maoist threat, but the effort to date remains vastly inadequate, both in mobilizing capacity and in implementing policy. The current counterinsurgent (CI) strategy is typically Indian – manpower-intensive and enemy-centric. It emphasizes building up force numbers to “saturate” areas with government forces and prioritizes kinetic action to suffocate the insurgency by attrition. Only lip service is paid to Western-style population-centric strategy; CI forces are present to target insurgents, not secure the population. The resultant flood of ill-trained and ill-equipped soldiers conducting large-scale sweep and commando operations has exposed civilian populations to collateral damage and abuse, increased Maoist legitimacy and recruitment, and left populations open to reprisal attacks by insurgents. As such, it likely that the scale and intensity of violence will increase in the short-term, but over the longer-term, the sheer mass of government capacity may tip the balance. Even so, brute military force is unlikely to ever fully extinguish an insurgency that is driven primarily, if not exclusively, by social and status grievances. In India’s federalist structure, states assume primary responsibility for combating Maoism, but their inadequacy has forced central “paramilitary” police forces to assume the leading COIN role. “Operation Green Hunt” launched in November 2009 deployed about 70,000 Central Reserve Police Forces (CRPF) personnel (split roughly evenly between combat and support staff) to reach a 2011 end-strength of 73 battalions across Maoist-affected states.[xii] The CRPF is India’s largest internal security force and is a resource provider of sorts for the central government – sending emergency infusions of armed police to insecure areas across the country.[xiii] The nomenclature of “paramilitary” typically attributed to the CRPF may overestimate its true capabilities – it is nowhere close to being a specialized CI force.[xiv] In Kashmir, some CRPF units received intensified resourcing and training allowing them to independently secure key terrain districts, [xv] but in net terms, the CRPF is subject to all the problems of the Indian police sector including chronic shortfalls of equipment, training, leadership, and logistical and administrative support. It struggles in basic constabulary operations – let alone open combat against a tactically proficient insurgent on home terrain. Symbolic of the challenge, some CRPF units’ still lack protective vests, even while deployed in frontline combat roles![xvi] For anti-Maoist operations, the CRPF is supported by other state armed police forces, i.e. those state police units trained for higher grade law and order problems, including India Reserve Battalions (IRB). These forces are more competent than the regular police, but there is generally a net decline in combat capacity, discipline and professionalism down the hierarchy of security institutions. Scale, capacity and terrain challenges severely hamper the CI force. 70,000 troops cannot by themselves realistically expect to affect any measurable difference over a population of at least 450 million people across 1.86 million square kilometers of tough, remote terrain[xvii] – especially without adequate support from effective civil police for regular law and order functions. The UN recommends a peacetime police-to-population ratio of 222 policemen per 100,000 members of the population, which India – and especially its insurgency-affected areas – falls far short of. [xviii] In the Maoist heartland of Chhattisgarh and Jharkhand, new figures show their police-to-population ratios at 226 and 206 in 2010,[xix] a dramatic improvement (at least on paper) from 2000, when the ratio was a mere 50![xx] Other states lag far behind. Orissa remains at 136, West Bengal at 100, and Bihar at just 74.[xxi] Numbers tell only part of the story. Indian police are notoriously corrupt and brutal by Western standards. Draconian sedition laws punish even the semblance of sympathy for the Maoist cause,[xxii] and anti-Maoist operations regularly leave behind a trail of destruction – including serious abuses such as torture, extrajudicial killings, arbitrary detentions and rape.[xxiii] In the field many units – other than some elite forces – are tactically outmatched. Maoists benefit from the guerilla’s ability to choose the time and place of engagement, allowing them to confront the state at its weakest points. Coordinated attacks have penetrated high-security areas with relative impunity, but most notable was the 2010 Maoist ambush in Dantewada that killed 76 soldiers of the 62nd CRPF Battalion, the single largest loss of life in Indian COIN history. The event deeply undercut the Indian government’s claims of progress, and revealed systemic failures. 62 Bn. had served previously in anti-Naxal operations in Bihar, but like other CRPF units was shifted in an ad hoc manner on the basis of availability rather than suitability for the mission. As a result, it failed to acclimatize to the local physical and human terrain, evident when the force found itself trapped on a narrow jungle path. An IED was able to halt the entire column by disabling the lead vehicle, and well-positioned guerillas prevented any retaliatory maneuver.[xxiv] Chronic deficiencies in leadership were also evident – not uncommon in a force that sees its best officers poached by other agencies.[xxv] The unit commander reportedly lied about his position to avoid a long-range field patrol, and failed to report a lost radio that likely allowed guerillas to track to column over several days.[xxvi] Insurgent intelligence dominance was easily evident – the Maoists were able to maneuver 1,000 men into place without detection, no doubt benefiting from at least some local support. Dantewada was an exceptional incident, but there are a legion other equipment and training challenges that limit CI abilities. Drastic expansion in force size has come without a commensurate emphasis on building up an adequate support base. Troops are barracked in terrible living conditions and there is widespread resentment at the perceived lack of political support, as well as the lack of clarity and resources with which to conduct their missions. Force protection is low, especially against IEDs. Deployed counter-IED equipment is limited[xxvii] and current armored vehicles provide inadequate protection, forcing a reliance on vulnerable dismounted patrols. New armored vehicles are being introduced – but Maoists have generally adapted by increasing the size of their bombs.[xxviii] Unsurprisingly, morale is low. One soldier angrily declared to an embedded reporter, “Have you ever seen a war being fought like this? We don’t know if we are here to assist the state police on law and order or to flush out Naxals, or merely to oscillate between troubled territories, getting our jawans (soldiers) killed for no fault of theirs.”[xxix] He went on to point out various shortcomings including inadequate and sporadic rations, virtually no support for injured and killed soldiers, and points out that even “when I go on leave or when I am on my way back home [from camp], I travel that distance at the mercy of God or the Naxals. What morale are you talking about?”[xxx] Despite their tactical capabilities, Maoists adhere to classic guerilla tactics, readily ceding territory in the face of organized state offensives, even “liberated areas” such as Lalgarh district. Their mobility and trans-bordered nature allows them to exploit weak intra-state cooperation, making border areas between states particularly troublesome. Some states such as Chhattisgarh have multiple tri-junctions – where the borders of three states meet – allowing insurgents to mount attacks across state lines before retreating to safe havens.[xxxi] Success in one state – such as Andhra Pradesh – may only displace insurgents into others; the neighboring states of Orissa and Chhattisgarh have seen significant spikes in violence since. Several initiatives have been unveiled to overcome the jurisdictional conflicts that plague effective trans-border policing, most notably by creating unified commands in insurgency-affected states. Designed to act as ‘fusion centers’ to facilitate cooperation between states, between state and federal forces, and between civilian and military personnel, their result has so far been underwhelming, not least because of the pushback from many state and local governments. On the local level, a political-criminal interface ensures that many politicians are eager to collude with Maoists and profit from their control of mines and resources. In some states – such as Jharkhand and Bihar – political rivalries mean that states refuse to cooperate with federal efforts, and in others, leaders collude with the Maoists for self-preservation. In West Bengal, the state government has greatly slowed CI activity and all but allowed a Maoist sanctuary earning them greatly reduced levels of violence in the state, but damaging the overall COIN effort.[xxxii] The easy availability of central forces has also resulted in many states neglecting their own police modernization efforts. Unsurprisingly, simply augmenting force numbers has not paid dividends. Chhattisgarh and Jharkand both saw insurgent attacks rise despite a police surge, whereas in Andhra Pradesh, the state which has most effectively combated Maoists, the police force in population terms remained constant. Credit for reversing insurgent momentum is generally given to the state’s elite ‘Greyhound’ force built to live and operate in the jungle as the guerilla did, and fight the Indian jungle equivalent of a “bush war.” The force’s 1,000 personnel across 30 “assault units,” benefited from rigorous training and superior equipment (particularly communications technology) and were able to rapidly deploy and effectively operate on Maoist terrain. The Greyhounds have been extremely effective, but they did not operate in a vacuum. Beyond elite forces, Andhra Pradesh pursued an effective state police capacity-building effort, spreading tactically trained personnel across the force, and building synergistic relationships between the district police, intelligence assets and the Greyhounds.[xxxiii] The state also benefited from focused efforts to improve its COIN doctrine. It coordinated police strategies, created fortified police districts in vulnerable areas, improved intelligence sharing between security agencies,[xxxiv] cross-trained regular police units with elite police commando forces, and measurably implemented well-crafted community development programs. Unfortunately through the militarized lens of India’s COIN campaign, only the warfighting elements of Andhra Pradesh’s strategy have been replicated with earnest. The CRPF is raising ten Commando Battalion for Resolute Action (COBRA) battalions to reach an envisioned end-strength of about 10,000 men.[xxxv] COBRA battalions are expected to be some of the best-equipped paramilitary troops in the country, and are trained specifically for the Maoist fight. They are armed like a regular Army infantry platoon and are trained in counter-guerilla and jungle warfare operations at the elite Counterinsurgency and Jungle Warfare School (CIJWS), the Indian Army’s premier unconventional warfare training institution. State police forces – such as the India Reserve (IR) battalions are also are tasked with raising two companies of specialized ‘commando’ forces per battalion[xxxvi] - and more state police forces are being given at least some advanced warfare training. This militarization of the police may yield results in terms of removing insurgents from the field, but comes with the tradeoff in diverting attention and resources away from the equally crucial task of increasing and professionalizing regular policing capacity to “hold” cleared territory. Another worrying trend has been the outsourcing of security responsibilities to auxiliary non-state militias that operate with little oversight, training or accountability, and yet are deputized under the aegis of ‘Special Police Officers’ (SPOs) with official government sanction. Most prominent was the Salwa Judum (literally translated to “Purification Hunt” in the local Gondi dialect), a Chhattisgarh government-sponsored and equipped militia of about 5,000 lightly armed tribal people. Salwa Judum may have benefited from support and funding from mining companies, and was widely accused of extreme human rights abuses including forcible displacements of villages, killings and rape. In response, in July 2011, the Indian Supreme Court declared SPOs illegal and unconstitutional and ordered their disbandment. Indian security officials had routinely justified these forces as helping them ‘localize’ their force presence, build up human intelligence networks and provide alternative employment opportunities for tribal youth. They came, however, with substantial tradeoffs including the militarization of tribal society and the emergence of ‘warlords’ who maintain control over refugee camps and swathes of territory – making disbandment and reintegration difficult.[xxxvii] However, despite their record, SPOs did provide an important “force multiplier” for culturally foreign CI forces, and their replacement with regular police will take time – by some accounts at least a year.[xxxviii] Moreover even if SPOs are abandoned fully – itself a dubious prospect – other shadowy vigilante groups also exist, including the several “Cobra” organizations in Andhra Pradesh that retaliate against Maoist violence, particularly if committed against military and government officials.[xxxix] As detailed, Indian CI forces suffer many capacity shortfalls that impede their operational effectiveness, but major reforms are currently ongoing that could significantly increase the quality of anti-Maoist CI forces. Israeli assault rifles are being purchased,[xl] helicopters being redeployed back from peacekeeping missions ostensibly for anti-Maoist operations,[xli] and retired army soldiers being recruited as trainers.[xlii] Two of three sanctioned UAVs have been inducted to improve ISR capabilities and detect massed insurgent forces – although forested terrain restricts their utility[xliii] - and a variety of other new equipment is being inducted. All these if utilized effectively can improve the CI capacity to kill insurgents, but it is less certain that they can strategically end the insurgency.

#### Continued Indian development solves multiple extinction scenarios

Kamdar 7 (Mira Kamdar, World Policy Institute, 2007, Planet India: How the fastest growing democracy is transforming America and the world, p. 3-5)

No other country matters more to the future of our planet than India. There is no challenge we face, no opportunity we covet where India does not have critical relevance. From combating global terror to finding cures for dangerous pandemics, from dealing with the energy crisis to averting the worst scenarios of global warming, from rebalancing stark global inequalities to spurring the vital innovation needed to create jobs and improve lives—India is now a pivotal player. The world is undergoing a process of profound recalibration in which the rise of Asia is the most important factor. India holds the key to this new world. India is at once an ancient Asian civilization, a modern nation grounded in Enlightenment values and democratic institutions, and a rising twenty-first-century power. With a population of 1.2 billion, India is the world’s largest democracy. It is an open, vibrant society. India’s diverse population includes Hindus, Muslims, Sikhs, Christians, Buddhists, Jains, Zoroastrians, Jews, and animists. There are twenty-two official languages in India. Three hundred fifty million Indians speak English. India is the world in microcosm. Its geography encompasses every climate, from snowcapped Himalayas to palm-fringed beaches to deserts where nomads and camels roam. A developing country, India is divided among a tiny affluent minority, a rising middle class, and 800 million people who live on less than $2 per day. India faces all the critical problems of our time—extreme social inequality, employment insecurity, a growing energy crisis, severe water shortages, a degraded environment, global warming, a galloping HIV/AIDS epidemic, terrorist attacks—on a scale that defies the imagination. India’s goal is breathtaking in scope: transform a developing country of more than 1 billion people into a developed nation and global leader by 2020, and do this as a democracy in an era of resource scarcity and environmental degradation. The world has to cheer India on. If India fails, there is a real risk that our world will become hostage to political chaos, war over dwindling resources, a poisoned environment, and galloping disease. Wealthy enclaves will employ private companies to supply their needs and private militias to protect them from the poor massing at their gates. But, if India succeeds, it will demonstrate that it is possible to lift hundreds of millions of people out of poverty. It will prove that multiethnic, multireligious democracy is not a luxury for rich societies. It will show us how to save our environment, and how to manage in a fractious, multipolar world. India’s gambit is truly the venture of the century.

#### Imports are also key to meet growing fertilizer demand

Mukherjee and Panandiker ’12 Kaustav Mukherjee and Rahool Panandiker, “Natural Gas: The Achilles’ Heel of India’s Energy Security,” Boston Consulting Group, 8/22/2012, https://www.bcgperspectives.com/content/articles/energy\_environment\_natural\_gas/#chapter1

Appetite for natural gas from fertilizer producers, another major demand source, is also poised to increase sharply. Natural gas is the most cost-efficient source of feedstock for manufacturing urea, which accounts for 80 percent of all nitrogenous fertilizers produced in India. Besides being an efficient feedstock, natural gas is comparatively inexpensive, thus allowing for a smaller fertilizer subsidy from the government. The latent demand for gas in the fertilizer industry is significant. Although urea consumption in India grew by approximately 40 percent overall from 2001 through 2010, no major new production capacity came online during that period or since, largely owing to uncertainty over the availability of efficient and inexpensive feedstock coupled with a less-than-satisfactory investment policy. As a result, imports of urea have grown, representing nearly 20 percent of India’s urea consumption in 2010. Yet imports impose a cost burden. Analysts’ preliminary estimates indicate that India could save up to $500 million a year in fertilizer subsidies if urea imports were replaced by domestic production. Taking note of the situation, the government is finalizing its new urea-development policy to attract more investment in domestic production capacity. The government also plans to support some existing urea plants to meet growing domestic demand. Additionally, at least six existing plants have announced expansion plans that collectively amount to more than 7 million metric tons per annum (MMTPA) of additional production. All told, we expect that the capacity of domestic urea plants that utilize natural gas as a feedstock will grow at a CAGR of roughly 11 percent from 2011 through 2015, reaching about 27 million metric tons in 2015. This will drive demand for natural gas from fertilizer makers to approximately 62 million metric standard cubic meters per day (MMSCMD), representing 14 to 19 percent of the total demand for natural gas in 2015.

#### Fertilizer production’s falling behind now

Commodity Online 1/24 “'Natural Gas production declines affecting supply to Indian fertilizer companies'” Commodity Online, 1/24/2013, http://www.commodityonline.com/news/natural-gas-production-declines-affecting-supply-to-indian-fertilizer-companies-52402-3-52403.html

MUMBAI (Commodity Online): Decreasing gas production from KG Basin and lack of material improvement in discoveries of new sources of gas has affected the supply of gas to many Indian fertilizer companies, stated a report by Investment Information and Credit Rating Agency of India Limited (ICRA). Further, with the announcement of the New Investment Policy, the gas requirement for the new urea projects may be around 21-27 mmscmd. As the domestic availability of natural gas may not materially increase in the near to medium term, the fertilizer companies have to increasingly rely on R-LNG to meet their requirements.

#### Shortages will spill over and increase prices hurting global supply

Katakey ’10 Rakteem Katakey, “Reliance Gas Delay Halts India's First Fertilizer Investments in a Decade,” Bloomberg, 9/21/2010, http://www.bloomberg.com/news/2010-09-21/reliance-gas-delay-halts-india-s-first-fertilizer-investments-in-a-decade.html

India’s fertilizer makers will need to increase imports after Reliance Industries Ltd. fell behind schedule to raise natural gas supply used in making crop nutrients. The companies say the lack of gas will delay plans to invest $5.9 billion in factories. “We planned to set up a new plant about a year ago when we were told Reliance would increase gas production,” said K.L. Singh, director of technical services at the Indian Farmers Fertiliser Cooperative Ltd. Overseas purchases may rise to 7 million tons this fiscal year as food demand rises and domestic urea fertilizer output remains stagnant, he said. India, the biggest importer of potash fertilizer, needs to boost farm output to feed its 1.2 billion people. Global population growth is driving demand for crop nutrients, prompting BHP Billiton Ltd.’s $40 billion hostile bid for Potash Corp. of Saskatchewan Inc., the world’s biggest fertilizer producer. “Delays in Reliance’s production have had this ripple effect and expansion plans have been put off by a couple of years,” said Arvind Mahajan, executive director and head of energy and natural resources at KPMG Advisory Services Pvt. in Mumbai. “Fertilizer plants are affected the most.” Mumbai-based Reliance’s gas discovery off India’s east coast in 2002 encouraged companies including the fertilizer cooperative, known as Iffco, and Rashtriya Chemicals & Fertilizers Ltd. to build six plants and reduce imports, increasing urea capacity for the first time in a decade. Reliance said July 27 that output at the KG-D6 block in the Bay of Bengal, the country’s largest gas field, will be below capacity while it reviews the reservoir and safety procedures. Critical Component The fertilizer companies are reducing the use of naphtha, an alternative feedstock derived from crude oil, to make urea. The cost of producing the nutrient with naphtha is more than double than with domestic gas, for which the government sets the price, currently below spot liquefied natural gas levels, and allocates supply. “The plants can’t be built now because without gas commitments we can’t close finances,” Satish Chander, director- general of the Fertilizer Association of India, said by telephone from New Delhi. “Gas supply is the most critical part if imports are to be reduced.”

#### Insecure food production causes global instability

Ehrlich and Ehrlich 2-21 Paul R. Ehrlich is Professor of Population Studies, Department of Biological Sciences, Stanford University, Anne H. Ehrlich is the associate director and policy coordinator of the Center for Conservation Biology, Stanford University, “The Food Threat to Human Civilization,” Project Syndicate, 2/21/2013, http://www.project-syndicate.org/commentary/human-population-growth-has-become-unsustainable-by-paul-r--ehrlich-and-anne-h--ehrlich

But our guess is that the most serious threat to global sustainability in the next few decades will be one on which there is widespread agreement: the growing difficulty of avoiding large-scale famines. As the 2013 World Economic Forum Report put it: “Global food and nutrition security is a major global concern as the world prepares to feed a growing population on a dwindling resource base, in an era of increased volatility and uncertainty.” Indeed, the report notes that more than “870 million people are now hungry, and more are at risk from climate events and price spikes.” Thus, measures to “improve food security have never been more urgently needed.”

### Solvency

#### SOLVENCY

#### Energy markets are waiting on a U.S. signal on liquefied natural gas exports – exports revitalize the domestic industry

Johnston & Palti-Guzman 1/9 (Robert, director of global energy and natural resources at Eurasia Group, and Leslie, global gas analyst, "Johnston and Palti-Guzman: The Foreign Policy Uses of an Energy Bounty," 2013, [online.wsj.com/article/SB10001424127887324374004578217803412316408.html], jam)

The United States is poised to become a global gas superpower. Thanks to innovation and investment in shale-gas technology, the production of natural gas in America has surged by 20% since 2006. But this story is about to enter a new phase—one in which success will depend on whether and how well the White House prepares the way for exports of America's energy bounty. American gas production has grown so much that the global market is now intently focused on the "U.S. LNG export play," or shipments of liquefied natural gas overseas. The export demand is a win for U.S. gas producers, who are struggling with weak prices at home due to a domestic glut. Yet the surge of U.S. natural gas into global gas markets will have major implications for U.S. policy abroad, too. As the Obama administration considers energy-policy priorities for its second term, LNG exports could also be an attractive new tool in the State Department foreign-policy box. A boom in U.S. gas exports would help rebalance relationships between producers and consumers, largely to the advantage of America's allies. The current market consensus is that the U.S. will export about six billion cubic feet per day of natural gas (also measurable as 45 million tons of LNG) by 2020. That's the equivalent of about 8% of current U.S. gas production or 16% of global LNG production. Globally, that would place America just behind the world's largest current LNG exporters, Australia and Qatar. Liquefied natural gas (along with the shale-gas revolution) has brought the U.S. to the top of the list of global gas-reserves holders. Some contracts are being made already and as exports begin in 2016 after export facilities are completed, the U.S. will compete with other large gas-reserve holders such as Russia, Iran and Venezuela. The geopolitical impact of American gas exports will be felt in many ways. For instance, the rise of a major alternative supplier diminishes the likelihood of cartel behavior by rival suppliers such as Iran and Russia. These countries were among the key founding members of the Gas Exporting Country Forum, often described as a potential "gas OPEC." Although today there is already more gas produced and exported by countries outside the GECF than by its members, this trend will be accentuated by U.S. gas exports.

#### Doesn’t require new staffing, funding, or action by Congress

Levi 12 (Michael, PhD in war studies from the University of London (King's College), where he was the SSHRC William E. Taylor fellow, MA in physics from Princeton University, where he studied string theory and cosmology, BSc (Hons.) in mathematical physics from Queen's University (Kingston), David M. Rubenstein senior fellow for energy and the environment at the Council on Foreign Relations, director of the CFR program on energy security and climate change, testified before Congress and presented expert scientific evidence to the National Academy of Sciences on climate change and on nuclear security, former director of the Federation of American Scientists' Strategic Security Project, "A Strategy for U.S. Natural Gas Exports," Jun, [www.brookings.edu/~/media/research/files/papers/2012/6/13%20exports%20levi/06\_exports\_levi.pdf], jam)

In Chapter 4, I laid out a framework for consideration of the wisdom of allowing LNG exports. An examination of these components indicates that the benefits of allowing LNG exports outweigh the risks and costs, so long as downside risks to the local environment are mitigated, as discussed previously. Allowing exports would boost the U.S. economy, create jobs, reduce greenhouse-gas emissions, and create new geopolitical leverage for the United States. In particular, the likely benefits to the U.S. economy outweigh the benefits that would be realized by trapping natural gas in the United States in the hope that it will be used to replace oil. Barring exports would also weaken the U.S. hand in international trade diplomacy, including in the ongoing fight over Chinese restrictions on minerals exports. Strongly constraining U.S. gas exports would also require substantial interference in the currently integrated North American energy market, with the potential for economically and politically damaging fallout. The most acute risks associated with allowing natural gas exports are distributional and environmental; both could also spur a backlash against natural gas production more broadly. Both can and should be mitigated, however, with appropriate policies, as outlined earlier. The details are largely beyond the scope of this paper, but options include the many steps outlined in DOE (2011), severance taxes or impact fees that fund infrastructure and regulatory capacity, and bonding requirements for drillers that help communities recover damages from bankrupt operators (Davis 2012). I thus propose that, to facilitate potential natural gas exports, the DOE should approve applications for LNG exports to non-FTA countries that are pending before it, barring specific concerns about individual applications that are not related to the broader wisdom of allowing LNG exports. In doing so, the DOE is required to find that allowing exports is in the “public interest.” The framework outlined in this paper provides one way of presenting such an assessment. The FERC must also approve modifications to terminals in order for exports to be allowed (Ebinger et al. 2012). I propose that it approve any applications to operate export terminals that have been approved by the DOE, barring problems with individual applications that are unrelated to the broader wisdom of allowing LNG exports. Implementing these steps will not require any new staffing, funding, or action by Congress, which has already put in place the legislative framework needed to approve and monitor LNG exports. Congress need only refrain from placing new statutory restrictions on LNG exports.

#### LNG exports prevent IPI pipeline – US source credibility is key

Johnston & Palti-Guzman 1/9 (Robert, director of global energy and natural resources at Eurasia Group, and Leslie, global gas analyst, "Johnston and Palti-Guzman: The Foreign Policy Uses of an Energy Bounty," 2013, [online.wsj.com/article/SB10001424127887324374004578217803412316408.html], jam)

Furthermore, the rise of American LNG exports makes it easier for Washington to convince allies not to do business with rogue states, particularly Iran. With the prospect of American LNG imports, India, for example, now has more attractive alternatives to the Iran-Pakistan-India pipeline. Pipelines are like a marriage, where the partners may be locked into supply and pricing arrangements that can last decades. A reliable and stable supplier of LNG such as the U.S. eliminates the need for risky long-term infrastructure projects and contracts. With U.S. gas exports set to add to the global supply, there is also less interest in riskier Iranian and Venezuelan LNG export projects, which may now never materialize, as they would have to compete with more advanced U.S., Canadian, East and West African projects. Russia's Gazprom OGZPY +0.67% is now positioning itself in anticipation of more competition from the U.S. In the past two months, Gazprom announced that it is launching a gas program in eastern Russia with the development of the Chayanda field and new export infrastructures to increase its market share in Asia. Gazprom also is investing in the offshore section of the South Stream pipeline from Russia under the Black Sea to Bulgaria, to bypass Ukraine and focus instead on locking in European market share. Yet in Europe, American LNG exports will be a welcome source of diversification to cut energy dependence on Russia. Gas from the U.S. could be as important for Europeans as the planned Nabucco West pipeline that will bring 10 billion cubic meters of Azerbaijani gas into Europe. U.S. LNG will also play a central role in helping the U.K. reduce its dependence on Qatar—a risk to watch closely, especially in light of the Iranian threat to close the Strait of Hormuz, which is the only sea access to Qatar. In Asia, Japan and India are enthusiastic about the potential of U.S. LNG. News reports that say diplomats of both countries have urged the Department of Energy and the State Department to authorize enough production and export projects to satisfy their goals of importing cheaper gas from the U.S. In post-Fukushima Japan, American LNG is part of a new acquisition strategy designed to yield a more diversified supply portfolio, both in terms of sources and pricing. Another appeal of new U.S. LNG supply is that American gas prices are linked to Henry Hub futures, a benchmark system (named after a major distribution hub in Louisiana) where prices reflect supply and demand. In the rest of the world, however, most gas sales until now have been contracted at a price calculated as a certain percentage of the oil price. As a result, buyers are currently paying a premium for oil-market risks that have little to do with global gas supply and demand. Exports of LNG from the U.S. could further encourage the decoupling of international gas prices from oil prices, and push down gas-market prices. This pressure on traditional LNG pricing mechanisms in Asia—where buyers are especially burdened by the premium for oil-market risks that have little to do with the global LNG market—will take time and will not only be the result of U.S. LNG exports. But the prospect of buying gas from America has already improved the bargaining position of European and Asian importers, largely to the benefit of U.S. allies. Negotiations on sales-purchase agreements for many such projects are under way, ahead of final investment decisions by project developers in Australia, Canada, the U.S. and East Africa. Unlike in many other major gas-producing nations, the U.S. government does not dictate investment decisions or contractual arrangements by American oil and gas companies. Yet through its power to permit exports of U.S. gas and set the regulatory and environmental framework for domestic production, the White House will effectively say yea or nay to the emergence of the U.S. as a global gas superpower. The world is waiting for its answer.

#### Also Indian energy security

Kugelman 11 (Michael, senior program associate for South and Southeast Asia at the Woodrow Wilson Center, M.A., International Relations, The Fletcher School, Tufts University, "Integrating Energy Concerns into India's National Security Strategy," Dec 14, Journal of Energy Security, [www.ensec.org/index.php?option=com\_content&view=article&id=334:integrating-energy-concerns-into-indias-national-security-strategy&catid=121:contentenergysecurity1111&Itemid=386], jam)

Better inter-agency and international coordination, enhanced naval and reserves capacity, and greater efforts toward regional peace can all bring positive outcomes for both energy and national security. Admittedly, however, they do little to lessen India’s dependence on overseas hydrocarbons – an addiction that fuels the very insecurity these three recommendations are meant to reduce. Therefore, New Delhi’s official policy of energy resource diversification –particularly in terms of focusing on a broader array of indigenous supplies – is a welcome one. In the last few years, 15 trillion cubic feet of natural gas deposits have been discovered in the Bay of Bengal off Andhra Pradesh state, and ample oil reserves unearthed in the state of Rajasthan. Such finds have prompted the Indian energy giant Reliance to promise that it will increase indigenous oil and gas output by 40%. Indeed, while gas currently constitutes only 9% of India’s primary energy mix, Reliance has taken major steps to ensure that the fruits of the Bay of Bengal discovery are exploited to the fullest. Soon after the gas deposits were found, the firm built a pipeline of nearly 50 diameters, with production capacity of nearly 3 billion cubic feet per day. This should prove advantageous for India’s energy security, given that natural gas consumption in India has risen faster than any other fuel in recent years (demand has grown at a 6.5% rate over the last decade). Additionally, the power generation, fertilizer, and petrochemical production industries are all moving toward natural gas. The gas discovery may prove to be more of a boon for energy security than the oil one. Even with the oil found in Rajasthan, India houses less than 0.5% of the world’s proven reserves of crude oil. Not surprisingly, a significant majority of India’s oil consumption (two-thirds) originates from abroad. Furthermore, oil constitutes a relatively small portion of electricity generation in India (see chart below).

#### High price elasticity prevents price convergence – that increases export volumes and cost-competitiveness

Levi ‘12 (Michael, PhD in war studies from the University of London (King's College), where he was the SSHRC William E. Taylor fellow, MA in physics from Princeton University, where he studied string theory and cosmology, BSc (Hons.) in mathematical physics from Queen's University (Kingston), David M. Rubenstein senior fellow for energy and the environment at the Council on Foreign Relations, director of the CFR program on energy security and climate change, testified before Congress and presented expert scientific evidence to the National Academy of Sciences on climate change and on nuclear security, former director of the Federation of American Scientists' Strategic Security Project, "A Strategy for U.S. Natural Gas Exports," Jun, [www.brookings.edu/~/media/research/files/papers/2012/6/13%20exports%20levi/06\_exports\_levi.pdf], jam)

More intriguing is the possibility that U.S. natural gas prices will turn out to be far less sensitive to export volumes than most expect. This might allow much larger quantities of exports. Deloitte (2011) projects a mere 12-cent increase in the price of a thousand cubic feet of natural gas were the United States to export six billion cubic feet of natural gas each day. Such high elasticity would likely mean that U.S. exports would rise until the gap between U.S. and overseas prices was fully closed, net of liquefaction and transport costs (including normal profits), through a combination of rising U.S. prices and falling prices overseas. In this case, the macroeconomic benefits to the United States would be higher than those estimated above, both because of larger export volumes, and because export volumes would be sourced more from increased production than from decreased domestic use. The climate benefits might also be greater, because more natural gas would be available to displace coal overseas, and less would be drawn away from U.S. power plants. And the geopolitical and trade policy benefits would be larger, since greater U.S. LNG exports would give U.S. exporters a more dominant position in overseas markets. On the flipside, the consumer consequences would not change: the price impact of exports would remain the same; it is only export volumes that would increase. The greatest risk from much larger exports would be to the local environment; greater exports would further reinforce the importance of ensuring that proper protections for water, air, and local communities were in place.

### Plan

#### The United States Department of Energy should approve applications for liquefied natural gas exports to the Republic of India.

## 2AC

### Topicality

#### Plan meets restriction and incentive

Pudner, Law degree from Georgetown, Financial Institutions Lawyer at Baker Donelson, 9-5-12 (Stephen, “Can Cheap Natural Gas Save the U.S. Construction Industry?” 9-5-12, <http://www.bakerdonelson.com/baker_bricks/blog.aspx?entry=224>)

These large supply increases have driven the price of natural gas in the U.S. down substantially compared to the prices in other countries, with U.S. prices currently approximately one-fourth the price for natural gas in Japan and half the price for natural gas in the United Kingdom. These price differentials give companies a large financial incentive to convert U.S. natural gas into liquefied natural gas (LNG) and export it to the global market, if they can obtain the necessary regulatory approvals and necessary financing to fund the multi-billion dollar projects. Before a company can build and operate an export terminal capable of chilling natural gas to convert it into exportable LNG, it must receive authorization from both the U.S. Department of Energy’s (DOE) Office of Fossil Energy and the Federal Energy Regulatory Commission (FERC). To date, only one proposed export terminal has received the necessary approval from both the DOE and FERC: the Cheniere/Sabine Pass LNG export terminal project in Sabine, Louisiana. Cheniere Energy anticipates spending between $4.5 billion and $5 billion to convert its existing LNG import terminal in Sabine, Louisiana into an LNG export terminal, and has already awarded a $3.9 billion contract to Houston, Texas based engineering company Bechtel Oil, Gas and Chemicals Inc. to design and construct the natural gas processing units. This project should spur many opportunities in and around Louisiana and Texas for contractors, suppliers, and manufacturers of the equipment and labor necessary to build the massive, and technologically advanced facility.

#### Export restrictions are production restriction

Crosby, law partner at Budin and Partners, Geneva, 9-29- ‘9 (Daniel, “Panel 2: Import, Export and Production ¶ Restrictions on Energy Goods and ¶ Services,” 9-29-09, <http://graduateinstitute.ch/webdav/site/ctei/shared/CTEI/events/Energy%20Conf/CTEI%20Energy%20Conference%20Crosby%20background%20note.pdf>,)

No WTO rules apply to Members’ decisions on whether or not to produce natural resources, including water, agricultural products, timber, ores, and energy resources like coal, oil, and natural gas. Arguments have been made that decisions to regulate natural resource production could be considered “export restrictions” under Article XI of the General Agreement on Tariffs and Trade (1947), which prohibits quantitative export restrictions. However, most Members consider that the exploitation of natural resources is reserved permanently and exclusively to nations’ internal sovereignty and remains outside the scope of the WTO Agreements.

#### Restrictions are policy barriers that block energy production

USEA, 2003 [United States Energy Association, Energy Policy Bulletin, Issue 5, 4-16-03, “Energy Supply Diversity” <http://w.sari-energy.org/Publications/Documents/bulletins/bulletin5.pdf>, p.1)

Government policy makers should identify barriers to energy resource development and to energy efficiency and wherever possible strive to remove these barriers. Often these barriers were created by government action, either legislative or regulatory actions in an era vastly different from the first decade of the twenty first century. ¶ Restrictions on energy production, transportation and utilization may not recognize strides in technology changing economies, domestic geopolitical shifts, environmental protection and more recently, the need to drastically improve our homeland security.

#### NG production includes extraction and liquefaction

IEA Energy Statistics Division ‘5 (International Enegy Administration, “Energy Statistics Manual,” 2005, <http://www.iea.org/stats/docs/statistics_manual.pdf>)

The production of primary fossil fuels is usually measured close to the point of extraction from the reserves. The quantities produced should be those measured when the fuels are in a marketable state. Any quantities which are not saved for use or sale should be excluded from the production figure. For example, some of the gases extracted from a gas or oil field may be returned to the field to maintain pressure (reinjected gas), flared or released into the atmosphere (vented gas). The remaining gases may then be processed to remove some of the heavier gases (natural gas liquids). The production of marketable natural gas should be measured or calculated only after the reinjected gas, waste gas and the natural gas liquids have been removed (see chapter on natural gas).

#### Topic education – natural gas production is at an all-time high, which makes reading straight-up increase production affs impossible. The only topical gas affs that have any unique advantages are ones like export – it’s the only way to ensure natural gas education

Williamson, Well Servicing Magazine, ’12 (Brandon, Well Servicing is about natural gas wells, not servicing people/things well, whatever that means, “Exporting America’s Natural Gas,” May/June 2012, <http://wellservicingmagazine.com/exporting-america%E2%80%99s-natural-gas>)

Domestic natural gas production in America is at record levels. According to Andrew Ware, 32 of the 50 states in America produce natural gas. This saturated market is one of many factors contributing to low natural gas prices. With prices at current levels, there is little incentive to produce natural gas.The resulting climate is one in which there are massive amounts of natural gas in America with few profitable markets to sell to. This imbalance is compounded by the closed-market loop in the American natural gas market — importing is allowed but not exporting.

#### Ground – the plan is key to increase production – that solves their offense

Boman, Rigzone, ‘12(Karen, “Paper: US LNG Export Benefits Outweigh Modest Impacts on Industrial Output,” 6-6-12, <http://www.downstreamtoday.com/news/article.aspx?a_id=36408>)

The impact of U.S. LNG exports on U.S. industrial output is modest, as most U.S. industries are not particularly energy intensive. Some parts of the chemical industry that rely on natural gas liquids – ethane in particular – could benefit, as U.S. natural gas production is expected to rise to meet LNG export demand, said Levi.¶ "When you really drill down to EIA [Energy Information Administration] modeling, you see NGL supply growing as increased production in response to exports," Levi told Rigzone.

### CIR Bad

#### Plan is incredibly controversial—causes heated senate fights

Gustke ’12 Constance Gustke, “Domestic Critics Slow Potential LNG Export Boom,” CNBC, 6/20/2012, http://www.cnbc.com/id/47279981

Heated debate over the impact of liquefied natural gas exports on domestic prices is threatening to derail them at a crucial time for the U.S. industry. A sudden abundance of natural gas and unprofitably low prices — the result of fracking technology that's opened up previously unreachable shale-gas reserves — has the industry looking for new markets. But Massachusetts Rep. Edward Markey, a top Democrat on the House Natural Resources Committee, is pulling out the stops to slow exports. He began worrying about the impact of liquefied natural gas (LNG) exports on U.S. prices, when he saw permit applications piling up at the Department of Energy. So, Markey and Sen. Ron Wyden, D-Ore., another key voice on U.S. energy policy, introduced bills requesting a timeout on LNG permit approvals until 2025. “We saw a policy shift to exports without even a debate,” says Jonathan Phillips, a senior policy adviser to Markey on the Democratic staff of the Natural Resources Committee. “Yet all the studies show that exports will increase domestic prices. We’re not going to race ahead, allowing oil and gas companies to reap large profits at a cost to consumers." Consumer and environmental groups are also dead-set against the export of LNG, which converts natural gas into liquid form through a rapid chilling process for easier transport. The chemical industry has voiced dissent because it depends on cheap natural gas to produce fertilizers and feed stock.

#### Strong industry opposition to LNG exports – alienates key dems and manufacturing lobbies

Geman 1/10 (Ben, the Hill, "Manufacturers go to war with oil industry over gas exports," 2013, [thehill.com/blogs/e2-wire/e2-wire/276585-oil-industry-manufacturers-lock-horns-over-gas-exports])

The petroleum industry and several big manufacturing companies are warring over whether U.S. regulators should allow a major expansion of liquefied natural-gas exports. Dow Chemical, Eastman Chemical, Alcoa and others have launched a coalition called “America’s Energy Advantage” to warn against “unfettered” exports, alleging it would harm U.S. manufacturing growth and cost jobs. The new coalition is calling on the Energy Department to “disregard” a federally commissioned consultant’s recent study that said exporting gas will be a net economic win for the nation, calling it inaccurate. Energy-thirsty manufacturers have welcomed the U.S. gas production boom and low costs, and fear price spikes if the Energy Department approves a slew of pending applications to export gas from the Gulf Coast, Oregon and elsewhere. The coalition drew a strong rebuke Thursday from the American Petroleum Institute, a powerful lobbying group that represens oil and natural-gas companies. “Short-sighted efforts by a few industrial users to restrict exports in an apparent attempt to control prices would deprive American families of the wider benefits of lower costs and increased job creation,” said API President Jack Gerard in a statement. “Restricting exports of energy as a ‘strategic resource’ makes no more sense than unnecessarily restricting the export of chemicals, agriculture products or cars, and such a backward move could violate international trade rules,” he said. The public jousting between big industries is just one front in growing political and lobbying battles over gas exports. A pair of senior Democrats, Sen. Ron Wyden (D-Ore.) and Rep. Edward Markey (D-Mass.), are also warning that the exports could harm consumers and domestic manufacturing. In the near term, the lawmakers and the new coalition are both attacking the DOE-commissioned report, which concluded that exports would put some upward pressure on prices but won’t pose a major threat to domestic industries. America’s Energy Advantage has launched an online petition drive with messages to DOE alleging the study underestimates the effect that exports would have. It “fails to recognize the significant increase in demand from manufacturing that is a direct result of more affordable natural gas supplies,” the petition states. The other members of the new coalition are the chemical company Celanese, steel giant Nucor and the American Public Gas Association, which represents publicly owned local gas utilities. The group says federal officials should “move cautiously on permitting natural gas exports in order to measure impact on price, security and jobs.” DOE is weighing over a dozen applications to export more than 22 billion cubic feet of per day to nations that don't have free-trade agreements with the U.S., and has said the study unveiled last month will help inform its reviews.   Federal law, according to DOE, generally requires approval of exports to nations that have the deals with the U.S., but other applications face more scrutiny. While there are divides over exports among industries, the powerful U.S. Chamber of Commerce favors sending U.S. gas abroad, Chamber CEO Tom Donohue said in his annual “state of American business” address Thursday. But Wyden, the chairman of the Senate Energy and Natural Resources Committee, urged Energy Secretary Steven Chu to redo the study in a letter Thursday. He said the study, conducted by NERA Economic Consulting, did not properly account for natural-gas demand.

#### CIR passes—Obama pushing

Nakamura 2/21 (David, WaPo, “Labor, business leaders declare progress in immigration talks” <http://www.washingtonpost.com/blogs/post-politics/wp/2013/02/21/labor-business-leaders-declare-progress-in-immigration-talks/>) will

Labor and business leaders on Thursday said they have made progress toward a pact over how to implement reforms of immigration laws in the workplace, but they stopped short of agreeing on a new guest worker program for foreigners.¶ ¶ In a joint statement, AFL-CIO President Richard Trumka and U.S. Chamber of Commerce President Thomas Donohue expressed optimism over their negotiations and emphasized they are committed to finding a solution that would allow companies to more quickly and easily hire foreigners when Americans are not available.¶ “Over the last months, representatives of business and labor have been engaged in serious discussions about how to fix the system in a way that benefits both workers and employers, with a focus on lesser-skilled occupations,” the two leaders said. “We have found common ground in several important areas, and have committed to continue to work together and with Members of Congress to enact legislation that will solve our current problems in a lasting manner.”¶ A bipartisan Senate group that is developing immigration reform legislation had asked the AFL-CIO and Chamber to come up with an agreement over a potential guest worker program, a controversial provision that has helped sink previous attempts to overhaul immigration laws.¶ Donohue has called for a new guest worker program that would allow companies to hire more foreigners in low-skilled occupations such as farming where there have been shortages of U.S. workers, and to allow foreign workers increased mobility to change jobs when necessary. Trumka has said the labor union would agree only if the number of visas are reduced during times of high umemployment and if foreign workers are provided a path to citizenship to help protect wages and benefits to all workers.¶ In the joint statement, the two sides said they have agreed to three principles. The first is that American workers should have the first crack at all jobs, and the second would provide a new visa that “does not keep all workers in a permanent temporary status, provides labor mobility in a way that still gives American workers a first shot at available jobs, and that automatically adjusts as the American economy expands and contracts.”¶ The third principle is a call for a new, quasi-independent federal bureau that would monitor employment statistics and trends to inform Congress about where to set visa caps for foreign workers each year.¶ “We are now in the middle – not the end – of this process, and we pledge to continue to work together and with our allies and our representatives on Capitol Hill to finalize a solution that is in the interest of this country we all love,” Donohue and Trumka said in the statement.¶ The Senate working group, comprised of four Democrats and four Republicans, is aiming to develop legislative proposals by next month, and President Obama has affirmed his support of the group’s general principles.¶ Obama’s own legislative proposals, contained in a draft bill that the White House says is a backup plan if the Senate effort fails, does not include a guest worker provision. As a senator in 2007, Obama voted in favor of an amendment to a comprehensive immigration bill that would have sunset a guest worker program after five years; that immigration bill ultimately failed in the Senate, and some Republicans cite the amendment as a reason why.¶ White House press secretary Jay Carney said the joint statement represented “yet another sign of progress, of bipartisanship and we are encouraged by it. At the same time, it is an agreement on principles. We remain focused on encouraging the Senate to develop a comprehensive bill.”

#### No CCP collapse—the government represses instability

Pei 9 (Minxin, Senior Associate in the China Program at the Carnegie Endowment for International Peace, 3/12. “Will the Chinese Communist Party Survive the Crisis?” Foreign Affairs. http://www.foreignaffairs.com/articles/64862/minxin-pei/will-the-chinese-communist-party-survive-the-crisis)

It might seem reasonable to expect that challenges from the disaffected urban middle class, frustrated college graduates, and unemployed migrants will constitute the principal threat to the party's rule. If those groups were in fact to band together in a powerful coalition, then the world's longest-ruling party would indeed be in deep trouble. But that is not going to happen. Such a revolutionary scenario overlooks two critical forces blocking political change in China and similar authoritarian political systems: the regime's capacity for repression and the unity among the elite. Economic crisis and social unrest may make it tougher for the CCP to govern, but they will not loosen the party's hold on power. A glance at countries such as Zimbabwe, North Korea, Cuba, and Burma shows that a relatively unified elite in control of the military and police can cling to power through brutal force, even in the face of abysmal economic failure. Disunity within the ruling elite, on the other hand, weakens the regime's repressive capacity and usually spells the rulers' doom. The CCP has already demonstrated its remarkable ability to contain and suppress chronic social protest and small-scale dissident movements. The regime maintains the People's Armed Police, a well-trained and well-equipped anti-riot force of 250,000. In addition, China's secret police are among the most capable in the world and are augmented by a vast network of informers. And although the Internet may have made control of information more difficult, Chinese censors can still react quickly and thoroughly to end the dissemination of dangerous news. Since the Tiananmen crackdown, the Chinese government has greatly refined its repressive capabilities. Responding to tens of thousands of riots each year has made Chinese law enforcement the most experienced in the world at crowd control and dispersion. Chinese state security services have applied the tactic of "political decapitation" to great effect, quickly arresting protest leaders and leaving their followers disorganized, demoralized, and impotent. If worsening economic conditions lead to a potentially explosive political situation, the party will stick to these tried-and-true practices to ward off any organized movement against the regime.

### Con Con CP

#### Only the DOE can approve export applications

Winston 2/4 (Kate, writer at Platts, "New LNG study just one factor in export decisions: US DOE official," 2013, [www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/6115375], jam)

A recent study highlighting the net economic benefits of US liquefied natural gas exports is not the final word on whether to approve pending export applications, according to a top official at the US Department of Energy.¶ "One thing to emphasize is that the department has not outsourced this decision making process," Christopher Smith, deputy assistant secretary at DOE's Office of Oil and Gas, told state regulators Monday.¶ "That is a process that is still managed by the DOE, and the secretary of energy has the ultimate responsibility for making that decision," Smith said at a meeting of the National Association of Regulatory Utility Commissioners in Washington.¶ DOE recently collected the first round of comments on a study conducted by NERA Economic Consulting that found the broad economic benefits of LNG exports would outweigh domestic price hikes and other negative consumer impacts.¶ The study was the second of two LNG reports commissioned by DOE. The first, conducted by DOE's Energy Information Administration, found that US LNG exports could increase domestic wellhead gas prices by up to 54% by 2018, depending on factors such as the volume exported and the rate of domestic gas production.¶ "We will be considering the study that was done by NERA ... we will be considering the results of the EIA study that was done last year and we will be considering all of the comments as part of a package to help us understand what is the totality of issues," Smith said. ¶ But DOE will have the final word on whether to approve more LNG exports to countries that do not have free trade agreements with the US, he said.¶ The law requires DOE to quickly approve applications to ship gas to countries that have FTAs with the US. However, the department can limit or block exports to non-FTA nations if it finds exports are not in the public interest. So far, only Cheniere Energy's Sabine Pass terminal in Louisiana has won approval to export to both FTA and non-FTA countries.

#### Even the perception of delay takes out the case

Bayless 3 (Robert, President – Independent Petroleum Association of Mountain States, “Energy Production on Federal Lands,” Hearing before the Committee on Energy and Natural Resources, United States Senate, 4-30)

Mr. BAYLESS. Senator, if I could follow up, not only is it an issue of whether those lands are available, but as you pointed out, the timing, if there is a long delay, it impedes industry. You are not worried about the industry; you are worried about gas supply. There are signals that come out of the market, price signals, that say we need more gas. We need greater—the price has gone up. Where is the supply? With these long delays, it creates uncertainty for companies to be able to drill those additional wells, to budget for drilling those additional wells. It really puts a bad filter on those price signals.

### SEP CP

#### Or they allow for future rollback of the plan – guts investor confidence

Loris 8-6 (Nicolas, Fellow in the Roe Institute for Economic Policy Studies – Heritage Foundation “Senate Energy Bill: Good Start, Room for Improvement,” Heritage Foundation, 2012, http://www.heritage.org/research/reports/2012/08/domestic-energy-and-jobs-act-good-start-room-for-improvement)

Lease certainty is another critical issue. The act states that the DOI cannot cancel or withdraw a lease sale after the winning company pays for the lease. Ensuring that the federal government does not pull the rug out from under a company that wins the lease sale would provide the certainty necessary to pursue energy projects.

#### That’s key to nat gas development

Kabelitz 6 (Dr. Klaus-Robert, Chief Economist – E.on Ruhrgas, one of the leading European players in natural gas, “Strategy, Economy, and Regulation,” International Gas Union, June, http://www.igu.org/html/wgc2006/pdf/com/PGC%20B%20final%20report.pdf)

It goes without saying that abundant gas reserves and favourable pre-tax economics may not deliver investment and production growth if the fiscal terms are so onerous as to make post-tax economics uncompetitive. Investors’ political risk perceptions are critical to gas developments. Political risk includes the risk of social and political disturbances, and the risk of unforeseen changes in legal and regulatory conditions. Political risk is a key component of total project risk for long term, large, capital intensive, complex projects involving installations that may easily be targeted or accidentally damaged in times of war or civil strife. Gas projects typically meet all these criteria. Concerning the regulatory aspect of political risk, an uneven playing field, an unstable fiscal framework and/or suspicions of a lack of commitment across the board to the sanctity of contracts can make otherwise low risk areas high risk from the point of view of investors.

#### No correlation with ecosystem stability

Calgary Herald, August 30, 1997

Ecologists have long maintained that diversity is one of nature's greatest strengths, but new research suggests that diversity alone does not guarantee strong ecosystems. In findings that could intensify the debate over endangered species and habitat conservation, three new studies suggest a greater abundance of plant and animal varieties doesn't always translate to better ecological health. At least equally important, the research found, are the types of species and how they function together. "Having a long list of Latin names isn't always better than a shorter list of Latin names," said Stanford University biologist Peter Vitousek, co-author of one of the studies published in the journal Science. Separate experiments in California, Minnesota and Sweden, found that diversity often had little bearing on the performance of ecosystems -- at least as measured by the growth and health of native plants. In fact, the communities with the greatest biological richness were often the poorest when it came toproductivity and the cycling of nutrients. One study compared plant life on 50 remote islands in northern Sweden that are prone to frequent wildfires from lightning strikes. Scientist David Wardle of Landcare Research in Lincoln, New Zealand, and colleagues at the Swedish University of Agricultural Sciences, found that islands dominated by a few species of plants recovered more quickly than nearby islands with greater biological diversity. Similar findings were reported by University of Minnesota researchers who studied savannah grasses, and by Stanford's Vitousek and colleague David Hooper, who concluded that functional characteristics of plant species were more important than the number of varieties in determining how ecosystems performed. British plant ecologist J.P. Grime, in a commentary summarizing the research, said there is as yet no "convincing evidence that species diversity and ecosystem function areconsistently and causally related." "It could be argued," he added, "that the tide is turning against the notion of high biodiversity as a controller of ecosystem function and insurance against ecological collapse."

### Australia DA

#### Doesn’t trade off

Choi et al 13 (Tom, international energy economist, ¶ having led projects for leading energy companies around the ¶ world, M.S. degree in ¶ Engineering-Economic Systems from Stanford University and ¶ B.A. degree in Economics from University of California, Los ¶ Angeles, and Peter J. Robinson, Deloitte Center, A report by the Deloitte Center for Energy Solutions and Deloitte MarketPoint LLC, quals, "Exporting the American Renaissance Global impacts of LNG exports from the United States," [https://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/Energy\_us\_er/us\_er\_GlobalImpactUSLNGExports\_AmericanRenaissance\_Jan2013.pdf], jam)

The largest LNG source that is displaced is Australian ¶ LNG. This result follows the rapid growth of Australian ¶ LNG projected by WGM, particularly in the BAU scenario ¶ in which Australian LNG grows from its current level of ¶ about 20 MTPA (3 Bcfd) to 130 MTPA (17 Bcfd) by 2030. ¶ By comparison, Qatar, currently the world’s largest LNG ¶ producer, has 77 MTPA (10 Bcfd) of LNG production ¶ capacity. Due to its high supply costs, particularly from ¶ coal-bed methane sourced projects, and its distance from ¶ market, Australian LNG is partially displaced by U.S. LNG ¶ exports and comprises almost 20% of the total displaced ¶ volumes by U.S. LNG exports to Asia and 10% with exports ¶ to Europe. However, bear in mind that Australian LNG is still ¶ projected to grow rapidly and become the global leader ¶ in LNG production even with U.S. LNG exports. Australian ¶ LNG production is projected to grow, but just not quite as ¶ high with U.S. LNG exports. Even in the case with U.S. LNG ¶ exports to Asia, Australia’s projected LNG volumes are just ¶ reduced by a little over 10%. Asian LNG is little affected ¶ because it has a transportation cost advantage over other ¶ LNG sources and the fact that most Asian LNG supplies are ¶ already under contract for firm delivery.

#### Terrorism dead now—radical action doesn’t appeal to the Middle Eastern public

Kurzman ’11 Charles Kurzman, professor of Sociology at UNC-Chapel Hill who specializes in Middle East and Islamic studies, “Why Is It So Hard to Find a Suicide Bomber These Days?” Foreign Policy, 8/15/2011

If terrorists like Taheri-Azar can be recruited through the Internet and books, then why aren't there more attacks? What is stopping people? I propose five answers. The first and most obvious answer is that most Muslims oppose terrorist violence. According to surveys by Gallup and the Pew Global Attitudes Project, support for attacks on civilians is a minority position in almost every Muslim community. (By way of comparison, a 2006 survey found that 24 percent of Americans consider attacks on civilians to be justified.) But even if only 10 percent of the world's billion Muslims supported terrorism, we would still expect to see far more terrorist activity than we do. The second answer is that much of the support for Islamist radicalism is soft. Al Qaeda and bin Laden may be "sheik" in the way that Che Guevara and Malcolm X are chic: objects of aspirational pop culture more than inspirations for revolutionary militancy. Terrorism expert Jessica Stern likens this to the fad for gangster rap: "Most of the youth attracted to the jihadi idea would never become terrorists, just as few of the youths who listen to gangsta rap would commit the kinds of lurid crimes the lyrics would seem to promote." This "radical sheik" was visible, for example, on Arabic-language bulletin boards telling the story of a vision that bin Laden was said to have had when he was 9 years old. In this dream, an angel supposedly told bin Laden that he would play a major role in a titanic clash with the West. Islamist revolutionaries were not the only ones to offer warm notes of appreciation for the story. One enthusiastic online response, for example, featured pictures of a woman with flowing black hair and a male model with blond highlights. "Hallelujah," wrote someone whose signature icon was a blond female with a bare midriff. This is radical sheik in action -- people who are impressed by bin Laden but do not share his conservative Islamic mores and are unlikely to translate their symbolic support into strategic action. Even among militants who share the terrorists' goals of establishing a strict Islamic state, al Qaeda faces competition. Islamist revolutionaries are divided, and that is a third reason for their relatively small numbers. Al Qaeda's most effective rivals are local Islamist revolutionaries such as the Afghan Taliban and the Palestinian group Hamas, which shy away from al Qaeda's global agenda and siphon off its support and recruitment base. The Afghan Taliban and Hamas have specific territorial goals and do not wish to widen the conflict to include Western targets outside their territories. In addition to revolutionary rivals, al Qaeda faces competition from more liberal Islamic movements. The fourth reason jihadi numbers are low is that the combination of democratic politics and cultural conservatism is far more popular among Muslims than the revolutionaries' anti-democratic violence. Pro-democracy Islamic organizations strike some observers as stalking horses for revolutionary violence, and in some cases they have been, but they are far more frequently the targets of revolutionary violence. In June 2009, for example, a young man armed with explosives walked into the Jamia Naeemia seminary complex in Lahore, Pakistan, just after midday prayers. He made his way to the office of the director, an Islamic scholar named Sarfraz Naeemi, and then detonated his bomb, killing Naeemi and several others, including himself. Naeemi was targeted for his outspoken opposition to Islamist revolutionaries. Several weeks earlier, he had participated in two large conventions of Pakistani Islamic scholars that condemned the "killing of those having dissenting opinion" as "manifestly against Islam" and complained about the assassination of Islamic scholars. And yet Naeemi was active in an Islamic political party that sought to implement sharia as the law of the land -- but through electoral politics, not through revolutionary means. That made him a threat to the revolutionaries. Anxiety over their unpopularity has divided the revolutionaries. Some have responded by converting to liberalism, while others have turned to ever-more-heinous attempts to purify their societies through violence. They have targeted cafes that the revolutionaries consider decadent, weddings that do not observe the revolutionaries' rituals, and mosques that do not follow their creed. This escalation is an intentional attempt to "drag the masses into battle," according to al Qaeda strategist Abu Bakr Naji. "We must make this battle very violent, such that death is a heartbeat away, so that the two groups will realize that entering this battle will frequently lead to death. That will be a powerful motive for the individual to choose to fight in the ranks of the people of truth in order to die well, which is better than dying for falsehood and losing both this world and the next." But this strategy has backfired. The more that terrorists target Muslims, the less popular the terrorists become -- the fifth reason that their numbers are so low. After terrorists bombed a wedding reception in Amman, Jordanians' positive attitudes toward al Qaeda plummeted by two-thirds. When terrorists bombed a cafe in Casablanca, Moroccans' confidence in bin Laden dropped by half. As terrorist campaigns have mounted in Pakistan, public opposition to violence against civilians has more than doubled. It is no surprise that the most popular revolutionary movements in the Middle East today are not Islamist terrorists but the pro-democracy uprisings of the Arab Spring, which offer the stirring narrative of ousting corrupt and oppressive rulers through peaceful protest. Why strap on a suicide vest when demonstrations and sit-ins are proving to be more effective?

# Rd 5 vs Whitman Emlet/King

## 1AC

### 1

#### #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.”

### 2

#### 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

### DARPA Demo CP

#### 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.

#### DoD installations are key – market pull

Jeffrey Marqusee 12, Executive Director of the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP) at the Department of Defense, “Military Installations and Energy Technology Innovation”, March, <http://bipartisanpolicy.org/sites/default/files/Energy%20Innovation%20at%20DoD.pdf>

The key reason that DoD cannot passively rely on the private sector to provide a suite of new, cost-effective energy technologies is the difficulty of the transition from research and development to full deployment. Many have noted this challenge; it is often described as the “Valley of Death,” a term widely used in the early and mid-1990s to describe the obstacles to commercialization and deployment of environmental technologies. DoD’s environmental technology demonstration program, the Environmental Security Technology Certification Program (ESTCP), was created to overcome that hurdle. Why can’t DoD rely on the Department of Energy (DOE) to solve the commercialization and deployment problem? DOE has a mixed record in this area. Reasons for past failures at DOE are: 1) the lack of a market within DOE for the technologies; 2) overly optimistic engineering estimates; 3) lack of attention to potential economic or market failures; 4) a disconnect between business practices at DOE and commercial practices, which leads to demonstration results that are not credible in the private sector; and 5) programs completely driven by a technology “push,” rather than a mix of technology push and market-driven pull.81 Many of these issues can be viewed as arising from the first: the lack of a market within DOE. Since DOE is neither the ultimate supplier nor buyer of these technologies at the deployment scale, it is not surprising that there are challenges in creating a system that can bring technologies across the Valley of Death. DoD’s market size allows it to play a critical role in overcoming this challenge for the energy technologies the department’s installations require, as it has for environmental technologies. In addressing the barriers energy technologies face, and understanding the role DoD installations can play, it is important to understand the type and character of technologies that DoD installations need. Energy technologies span a wide spectrum in costs, complexities, size, and market forces. Installation energy technologies are just a subset of the field, but one that is critical in meeting the nation’s and DoD’s energy challenges. DOE, in its recent strategic plans and quadrennial technology review, has laid out the following taxonomy (figure 3.5): It is useful to divide these energy technologies into two rough classes based on the nature of the market and the characteristics of deployment decisions. There are technologies whose capital costs at full scale are very high, for which a modest number of players will play a key role in implementation decisions. Examples include utility-scale energy generation, large-scale carbon sequestration, commercial production of alternative fuels, nextgeneration utility-grid-level technologies, and manufacturing of new transportation platforms. Some of these technologies produce products (e.g., fuel and power from the local utility) that DoD installations buy as commodities, but DoD does not expect to buy the underlying technology. A second but no less important class of energy technologies are those that will be widely distributed upon implementation, and the decisions to deploy them at scale will be made by thousands, if not millions, of decision makers. These include: 1) Technologies to support improved energy efficiency and conservation in buildings; 2) Local renewable or distributed energy generation; and 3) Local energy control and management technologies. Decisions on implementing these technologies will be made in a distributed sense and involve tens of thousands of individual decision makers if they are ever to reach large-scale deployment. These are the energy technologies that DoD installations will be buying, either directly through appropriated funds or in partnership with third-party financing through mechanisms such as Energy Saving Performance Contracts (ESPCs) or Power Purchase Agreements (PPAs). In the DOE taxonomy shown above, these distributed installation energy technologies cover the demand space on building and industrial efficiency, portions of the supply space for clean electricity when restricted to distributed generation scale, and a critical portion in the middle where microgrids and their relationship to energy storage and electric vehicles reside.

### Case

#### DOE incentives by themselves do nothing

ANA 12 (Alliance for Nuclear Accountability, “ Documents Reveal Time-line and Plans for “Small Modular Reactors” (SMRs) at the Savannah River Site (SRS) Unrealistic and Promise no Funding” June 8, 2012, <http://www.ananuclear.org/Issues/PlutoniumFuelMOX/tabid/75/articleType/ArticleView/articleId/558/Default.aspx>)

“While SRS may superficially appear to present certain attractive aspects for the location of SMRs, the site has not had experience with operation of nuclear reactors in over twenty years and has no current expertise in reactor operation,” said Clements. “While DOE is set to chose two SMR designs to fund for further development, SRS affirms that no construction funds will be provided, leaving vendors with the difficult and perhaps insurmountable task to find private funding for SMR construction.” Two of the three separate “Memoranda of Agreement” for three different and still hypothetical SMR designs include deployment timelines which are already admitted by DOE to be inaccurate since they were signed less than six months ago.

#### 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.

#### LFTRs don’t meltdown

Lerner 12 (George, president of Lerner Consulting, a consulting firm, "Can Use LFTRs to Consume Nuclear Waste," Jan 17, [liquidfluoridethoriumreactor.glerner.com/2012-can-use-lftrs-to-consume-nuclear-waste/], jam)

If the reactor overheats, a frozen plug melts and the fuel quickly drains out of the core into tanks where nuclear reaction is physically impossible. Radiation is contained by materials that remain solid at temperatures much higher than inside the reactor, with passive air cooling. (In solid-fueled reactors, you have to override everything that normally happens in the core and bring in coolant.) Fuel draining to the storage tanks could be triggered by seismic alert, chemical or temperature sensors, power outage, or the operators. [The 1989 Loma Prieta earthquake about 60 miles from Oakland, CA, reached Oakland about 30 seconds later. Japan has a seismic alert network, industrial plants shut down, elevators open at the nearest floor, trains stop, etc. California is building one.] “LFTR designs have a freeze plug at the bottom of the core—a plug of salt, cooled by a fan to keep it at a temperature below the freezing point of the salt. If temperature rises beyond a critical point, the plug melts, and the liquid fuel in the core is immediately evacuated, pouring into a subcritical geometry in a catch basin. This formidable safety tactic is only possible if the fuel is a liquid.” Hargraves, American Scientist, July 2010 “A passive core drain system activated by a melt plug enables draining the radioactive inventory into geometrically subcritical drain tanks that are passively thermally coupled to the environment.” Fast Spectrum Molten Salt Reactor Options, Oak Ridge National Laboratory, July 2011 “One of the current requirements of the Nuclear Regulatory Commission (NRC) for certification of a new nuclear plant design is that in the event of a complete electricity outage, the reactor remain at least stable for several days if it is not automatically deactivated. As it happens, the freeze-plug safety feature is as old as Alvin Weinberg’s 1965 Molten Salt Reactor Experiment design, yet it meets the NRC’s requirement; at ORNL, the [engineers] would routinely shut down the reactor by simply cutting the power to the freeze-plug cooling system. This setup is the ultimate in safe poweroutage response. Power isn’t needed to shut down the reactor, for example by manipulating control elements. Instead power is needed to prevent the shutdown of the reactor.” Hargraves, American Scientist, July 2010 Inherent Safety: Low Pressure LFTRs operate at atmospheric pressure. No high pressure to contain, no risk of pressure containment explosively failing. In a LFTR, there is no coolant boiling away. “A signature safety feature of the LFTR design is that the coolant — liquid fluoride salt — is not under pressure. The fluoride salt does not boil below 1400 degrees Celsius. Neutral pressure reduces the cost and the scale of LFTR plant construction by reducing the scale of the containment requirements, because it obviates the need to contain a pressure explosion. Disruption in a transport line would result in a leak, not an explosion, which would be captured in a noncritical configuration in a catch basin, where it would passively cool and harden.” Hargraves, American Scientist Volume 98, July 2010 “Only a low pressure vessel is needed as the salts run near atmospheric pressure as opposed to the thick walled vessels needed for LWR or PBMR. No water or sodium means no possible steam explosion or hydrogen production within the containment. In designs without graphite moderator, there is not even combustible material present.” D. LeBlanc / Nuclear Engineering and Design 240 (2010) p.1644-1656 “The containment walls are only required to contain a low-pressure internal environment and endure when subjected to external seismic and impact stressors. Halide salts are chemically inert, so they do not have exothermic reactions with the environment (oxygen, water) as would hot sodium or hot zirconium. With a greater than 500°C margin to boiling, the halide salts also do not have a credible route to pressurizing containment as would a water-cooled reactor. FS-MSRs also do not have any hydrogenous material within containment; thus they cannot generate hydrogen.” Fast Spectrum Molten Salt Reactor Options, Oak Ridge National Laboratory, July 2011 Inherent Safety: Containing Radioactive Material Radioactive cesium and iodine that were released in Fukushima-Daiichi would not be released in a LFTR accident. Cesium fluoride, strontium bi-fluoride are very stable salts. “Fluoride combines ionically with almost any transmutation product. This is an MSFR’s first level of containment. It is especially good at containing biologically active ‘salt loving’ wastes such as Cesium 137. The salts do not burn, explode or degrade in air or water, and the fluoride salts of the radioactive actinides and fission products are generally not soluble in water or air.” Wikipedia There are much less fissile materials (compared with LWR) in the fuel salt at any time, as continuous refueling enables operating with just enough to sustain reactivity. About half of the total fissile material is in the reactor core, the rest in the heat transfer and chemical processing loops. Thorium is one of the least radioactive materials, so (unless the LFTR is for waste burning, at a high security storage site) there is no hazardous fuel storage. Gasseous fission byproducts are easily and continuously removed from the reactor and safely stored. There is far less radioactive gas (that could leak in an accident) than in a LWR, and it isn’t pressurized. Inherent Safety: Self-Regulating The temperature in the reactor is self-regulating. The liquid fuel naturally expands if it gets hotter, slowing nuclear reaction, and contracts if it gets cooler (strong negative temperature coefficient of reactivity). [The nuclear reaction in the poorly-designed Chernobyl reactor got Hotter and Stronger as coolant boiled away.] Remove less heat (making less electricity), and the reactor throttles down. Remove more heat (making more electricity) and the reactor throttles up. “Most MSR designs have very strong negative temperature and void coefficients which act instantly, aiding safety and allowing automatic load following operation.” D. LeBlanc / Nuclear Engineering and Design 240 (2010) 1644-1656 Gasseous fission products are easily removed from the molten salt, making the reactor much more stable. (Xenon gas in LWR absorbs neutrons so readily it affects fission rate, so restarting the LWR must be done very carefully.) “Removing the most significant neutron poison xenon-135 made the reactor safer and easier to restart. In solid-fuel reactors, on restart the 135Xe in the fuel absorbs neutrons, followed by a sudden jump in reactivity as the 135Xe is burned out. Conventional reactors may have to wait hours until xenon-135 decays after shutting down and not immediately restarting.” Wikipedia – Molten Salt Reactor Experiment “The MSRE confirmed expectations and predictions. For example, it was demonstrated that: the fuel salt was immune to radiation damage, the graphite was not attacked by the fuel salt, and the corrosion of Hastelloy-N was negligible. Noble gases were stripped from the fuel salt by a spray system, reducing the 135Xe poisoning by a factor of about 6. The bulk of the fission product elements remained stable in the salt. Additions of uranium and plutonium to the salt during operation were quick and uneventful, and recovery of uranium by fluorination was efficient.” Wikipedia – Molten Salt Reactor Experiment Inherent Safety: Stable Chemistry “FS-MSRs have a negative salt void coefficient (expanded fuel is pushed out of the core) and a negative thermal reactivity feedback that avoids a set of major design constraints in solid-fuel fast reactors. A passive core drain system activated by a melt plug enables draining the radioactive inventory into geometrically subcritical drain tanks that are passively thermally coupled to the environment. FS-MSRs have a low operating pressure even at high temperatures; and FS-MSR salts are chemically inert, thermodynamically lacking the energetic reactions with environmental materials seen in other reactor types (hot zirconium and sodium with water). FS-MSRs do involve more intensive manipulation of highly radioactive materials than other reactor classes and thus small spills and contamination accidents appear to be more likely with this reactor class.” Fast Spectrum Molten Salt Reactor Options, Oak Ridge Nat’l Lab 2011

#### 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.

#### 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.

### CIR DA

#### Reform won’t pass—grid lock, impossibility of “securing” the border, and ag

Capital Press 2/22 By DAN WHEAT “Experts split on immigration reform chances” Posted: Friday, February 22, 2013 10:13 AM <http://www.capitalpress.com/washington/djw-ImmigrationChances-w-mugs-022213>

YAKIMA, Wash. -- Optimism and pessimism about immigration reform passing Congress were voiced at this week's Washington Farm Labor Association's Labor Conference in Yakima.¶ Kristi Boswell, director of congressional relations for the American Farm Bureau Federation, said congressional energy on the issue is high and that the Agriculture Workforce Coalition, of which AFBF is a founder, is negotiating differences with United Farm Workers of America and talking with Sens. Dianne Feinstein, D-Calif., and Marco Rubio, R-Fla., as agriculture champions of any bill.¶ "I'm optimistic, but I'm new to the game so I'm not cynical yet," Boswell said.¶ "Both sides recognize ag has to be part of the bill to pass. We have that in our favor but there's a lot of politics to get through," she said and commented favorably on the bipartisan Senate bill proposed by eight senators.¶ "I wish I could share your optimism, but it ain't gonna happen," retired U.S. Army Col. Felix Vargas said at the end of Boswell's speech.¶ The U.S.-Mexican border hasn't been secure for over 200 years, it won't happen in a year and that's a prerequisite to reform for Republicans, noted Vargas, a retired Foreign Service Officer at the U.S. State Department and an adviser to the Washington Farm Labor Association.¶ He urged Boswell to explore executive orders by the president to get immigration reform done. She responded that she questions if the president has that authority and that congressional action is better as a long-term fix.¶ The Agriculture Workforce Coalition is negotiating with United Farm Workers on its desire for the adverse effect wage rate and employer-paid housing and transportation to be part of any new guestworker program, Boswell said.¶ The coalition supports five-year terms of work authorization for undocumented agricultural workers in the U.S. and a new market-based foreign guestworker visa program that allows at-will and contract employment and year-round availability to help dairies and nurseries, Boswell said.¶ The House is further along on the issue than the Senate and Rep. Doc Hastings, R-Wash., "has been a tremendous asset," she said.¶ Later Vargas said he thinks Democrats and Republicans are posturing for "political optics" on immigration reform.¶ "The gridlock is such that they can't agree on the economy, a budget or gun control. I feel the chances of any immigration reform are very slim," he said.¶ An ag-only labor reform bill would be next best to comprehensive immigration reform for lasting change with presidential executive orders as a last resort, Vargas said.

#### GOP border paranoia is unfulfillable

Star Tribune 2/23 “Immigration debate renews demands for a `secure border,' but what does that mean?” Article by: ELLIOT SPAGAT, JUAN CARLOS LLORCA, CHRISTOPHER SHERMAN and BRIAN SKOLOFF , Associated Press Updated: February 23, 2013 - 9:27 AM <http://www.startribune.com/world/192707081.html>

Once, the barren mesas and shrub-covered canyons that extend east of the Pacific Ocean held the most popular routes for illegal immigrants heading into the U.S. Dozens at a time sprinted to waiting cars or a trolley stop in San Diego, passing border agents who were too busy herding others to give pause.¶ Now, 20 years after that onslaught, crossing would mean scaling two fences (one topped with coiled razor wire), passing a phalanx of agents and eluding cameras positioned to capture every incursion.¶ The difference, Homeland Security Secretary Janet Napolitano said on a recent tour, is like "a rocket ship and a horse and buggy."¶ In pure numbers it is this: Where border agents made some 530,000 arrests in San Diego in fiscal year 1993, they had fewer than 30,000 in 2012.¶ There is no simple yardstick to measure border security. And yet, as the debate over immigration reform ramps back up, many will try.¶ "Secure the border first" has become not just a popular mantra whenever talk turns to reform but a litmus test for many upon which a broader overhaul is contingent.¶ "We need a responsible, permanent solution" to illegal immigration, U.S. Sen. Marco Rubio, the Florida Republican who is working to develop a reform plan, said in his State of the Union response this month. "But first," he added, "we must follow through on the broken promises of the past to secure our borders and enforce our laws."¶ In fact, the 1,954-mile border with Mexico is more difficult to breach than ever. San Diego is but one example.¶ Two decades ago, fewer than 4,000 Border Patrol agents manned the entire Southwest border. Today there are 18,500. Some 651 miles of fence have been built, most of that since 2005.¶ Apprehensions, meantime, have plummeted to levels not seen since the early 1970s — with 356,873 in FY2012. Compare that to 1.2 million apprehensions in 1993, when new strategies began bringing officers and technology to border communities in California, Texas, New Mexico and Arizona. Now sensors have been planted, cameras erected, and drones monitor the borderlands from above.¶ But for those who live and work in communities along the international boundary, "secure" means different things. In Arizona, ranchers scoff at the idea. In New Mexico, locals worry about what's heading south in addition to flowing north. And in Texas, residents firmly believe that reform itself would finally help steady the flow of people and drugs.¶ These places have been transformed. Sealed? No. But as one border mayor asked: "How secure is secure?"¶

#### 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.

#### McCain and Rubio are the key players on immigration – they’ll shape the Republican line

Politico 1/29 (“"Obama, McCain, Rubio begin immigration dance” by Carrie Brown and Kate Nocera, featured in Mike Allen’s Playbook)

"[T]he president's top legislative priority rests in the hands of McCain, his former 2008 rival, and Rubio, one of GOP's leading candidates to take back the White House in 2016. That means the odds of passing a bill depend on whether the key players can ... navigate the tricky dynamics among them. ... Both parties want Latino voters to give them the credit for solving the problem - or at the very least, absolve them of the blame if nothing comes to pass. ... Obama, McCain and Rubio each face a crucial calculation of their own - how much jockeying they're going to do and how much credit they'll be willing to share across their personal and political divides to get the deal they all say they want done. ... The Senate group jumped ahead of the president, one Senate Republican aide involved in the process said, because their proposal would've been 'lost in the noise.' ...¶ "At the center are two people whom the White House really doesn't trust , but whose absence would raise serious questions about the viability of immigration reform. ... Rubio, who repeatedly criticized Obama during a conservative media blitz this month, softened up a bit when conservative radio show host Michael Medved ... Monday asked whether he expected the White House undermine him. ... 'I heard somewhere today their comments were generally positive, so that's good' ... Obama is prepared to give [the senators] time to reach an agreement on legislative language, and he won't release his own bill as long as they are making progress ... But the president will ... appeal directly to voters in an election-style campaign" starting today.

#### McCain loves nuclear

Boston Globe 8 (“McCain pushes nuclear power” 8/6/08 http://www.boston.com/news/nation/articles/2008/08/06/mccain\_pushes\_nuclear\_power/)

John McCain toured a nuclear power plant yesterday, the first such visit in recent history by a presidential candidate and one that highlighted the promise and peril of a technology central to reducing reliance on foreign oil.¶ The Enrico Fermi Nuclear Plant outside Detroit, named for the first physicist to split the atom, is home to both an operating power plant and another reactor that had a partial meltdown in the 1960s. It was decommissioned in 1972, while its successor continues to operate.¶ McCain is placing great stock in modern-day nuclear technology by calling for the construction of 45 nuclear power plants by 2030.¶ "Solving our national energy crisis requires an 'all of the above' approach," McCain said. "That will require aggressive development of alternative energies like wind, solar, tidal, and bio-fuels. It also requires expanding traditional sources of energy like off-shore drilling, clean coal, and nuclear power like the power produced at this plant here in Michigan."

#### Rubio loves nuclear

CFP 9 (Central Florida Politics, “Marco Rubio comments on house national energy tax” <http://centralfloridapolitics.com/2009/06/26/marco-rubio-comments-on-house-%E2%80%9Cnational-energy-tax%E2%80%9D/>)

U.S. Senate candidate and former Florida House Speaker Marco Rubio today issued the following statement regarding the Waxman-Markey cap-and-tax legislation currently being considered by the U.S. House of Representatives:¶ “As a U.S. senator, I would oppose this national energy tax on American consumers, farmers and business owners. At a time when our economy is struggling, a national energy tax would further strain family budgets and destroy jobs.¶ “Creating jobs in the energy sectors and becoming more energy efficient requires entrepreneurial innovation, not big government mandates. Instead of higher energy bills and job losses, the American people deserve a comprehensive, job-creating energy policy that promotes energy efficiency, alternative energy production and the development of our own natural resources. I would fully support a plan that encourages nuclear energy, exploration in the Arctic National Wildlife Refuge and environmentally safe leasing of oil and natural gas fields in the outer continental shelf and on federally owned lands with oil shale in the West.

#### Winners win

Hirsh 2/7 (Michael, National Journal, “There’s no such thing as political capital” 2-7-13 <http://www.nationaljournal.com/magazine/there-s-no-such-thing-as-political-capital-20130207>) will

Some political scientists who study the elusive calculus of how to pass legislation and run successful presidencies say that political capital is, at best, an empty concept, and that almost nothing in the academic literature successfully quantifies or even defines it. “It can refer to a very abstract thing, like a president’s popularity, but there’s no mechanism there. That makes it kind of useless,” says Richard Bensel, a government professor at Cornell University. Even Ornstein concedes that the calculus is far more complex than the term suggests. Winning on one issue often changes the calculation for the next issue; there is never any known amount of capital. “The idea here is, if an issue comes up where the conventional wisdom is that president is not going to get what he wants, and he gets it, then each time that happens, it changes the calculus of the other actors” Ornstein says. “If they think he’s going to win, they may change positions to get on the winning side. It’s a bandwagon effect.”

#### No link uniqueness –

#### Budget

Rothman 2/24 (Noah, Real Clear Politics, “The GOP’s biggest advantage: time” <http://www.realclearpolitics.com/2013/02/24/the_gop039s_biggest_advantage_time_302651.html>) will

Therefore, it is Obama's job to usher in meaningful reforms in his second term "“ the most promising being a reform of the immigration system that leads to citizenship for most of the nation's 11 million illegal immigrants.¶ But nothing can be done without the consent of Congress "“ the lower chamber of which is dominated by the opposition party. Presently, really since the tea party's ascension, budget battles have dominated Washington. Today's fight over “sequestration” was born in 2011 and is essentially an extension of the same issues that have dominated Washington since the 2010 midterm elections: how best to implement federal spending and debt reduction measures.¶ Budget tweaks do not a legacy make. Just ask former President Bill Clinton. Budget battles dominated the Clinton presidency for the entirety of his first term and a large part of his second term. He raised income tax rates and is the last president to preside over a balanced budget. But this achievement cannot be said to have defined the Clinton presidency, particularly since both the tax rates and the balanced budget were undone by his immediate successor. Budget battles rarely constitute a legacy achievement.¶ Obama wants to be able to sign major social reforms into law on the scale of President Lyndon Johnson's Great Society. However unpopular Johnson was at the close of his first and only full elected term in office, his achievements ensured that the judgment of history would at least be measured if not kind.¶ The president and his opponents in Congress know he is running out of time. As they always do, exogenous factors will soon interrupt Obama's pursuit of a domestic legacy achievement. A European debt crisis or an Iranian nuclear breakout could derail Obama's legislative goals with little warning.

#### Hagel, sequester

O’Brien 2/17 (Michael, NBC News, “McCain concedes: Hagel 'will probably have the votes necessary'” http://firstread.nbcnews.com/\_news/2013/02/17/16993619-mccain-concedes-hagel-will-probably-have-the-votes-necessary?lite)

The Hagel fight has consumed Congress in recent weeks, threatening to expend Obama's political capital as he enters a second term. It's yet to be seen whether this fight, and the looming fight to replace the sequester with other equivalent savings, would affect other elements of the Obama agenda — including gun control, and immigration.

#### DOE already announced nuclear SMR grants – that’s Halper

#### Nuclear fights now – loan guarantees

Dow Jones 2-14 (“South Co, US government close to nuclear loan guarantee deal <http://www.foxbusiness.com/news/2013/02/14/southern-co-us-government-close-to-nuclear-loan-guarantee-deal/>)

Nuclear Energy Institute President Marvin Fertel said Thursday that the U.S. government is close to closing a loan guarantee deal with Southern Co. (SO) that would back two new nuclear power reactors under construction in Georgia.¶ The Department of Energy and Southern reached a preliminary agreement on an $8.33 billion loan guarantee about three years ago, but talks have languished since then.¶ "I've been told recently that they are close to getting resolution and the government wants to do this," said Mr. Fertel, head of the industry's main trade group, in a briefing with Wall Street analysts.¶ Mr. Fertel stressed that he isn't involved directly in the negotiations. He said his understanding is that Southern believes the issues holding up the loan guarantee aren't "insurmountable."

### CCS DA

#### CCS will never happen in the U.S. because of tech problems and cheap natty gas – China becomes a leader anyway though

Biello 10/16 (David, associate editor at Scientific American, "Critical Carbon-Capture Technology Stalled," 2012, [www.scientificamerican.com/article.cfm?id=carbon-capture-and-storage-not-happening-fast-enough-to-combat-climate-change&page=2], jam)

But the Quest project is a rare example of a technology that seems stuck, much like the CO2 after it is pumped underground. The 2012 survey by industry group the Global CCS Institute found that although nine new projects were announced this year, eight previously announced ones failed, bringing the total number of CCS projects worldwide to 75. Of those 75, eight are in actual operation, storing some 23 million metric tons of carbon dioxide per year—or slightly more than the annual emissions of Bahrain—most of it from the processing of natural gas to remove CO2 so the fuel is ready to burn.¶ Despite the slow start, "CCS is an existing, real technology today," argues institute CEO Brad Page, adding that it is needed to meet any global goal to restrain global warming cheaply. The International Energy Agency estimates that the world needs more than 100 operational CCS projects—storing some 270 million metric tons of CO2 annually—by the end of this decade to keep global warming from surpassing a 2-degree rise in global average temperatures, given that more than 80 percent of the world's energy continues to come from fossil fuels. Or, as Page adds, it's about economics: "At stake is a very substantial power bill for the world's energy consumers if we don't get CCS up and running by 2050."¶ China prize¶ The U.S. was once the world leader in CCS experimentation, ranging from injecting CO2 underground to scour oil out of old wells to running the world's first combined carbon-capture-and-storage unit at the Mountaineer power plant in West Virginia. But Mountaineer's experiment came to an end in 2011, thanks to an inability to get customer-sourced funding approved by local regulators, given an absence of national legislation to restrain greenhouse gas emissions. "The hardware is still untapped," says chemical engineer Gary Spitznogle, director of new technology development and policy support at American Electric Power, the utility that owns and operates the Mountaineer coal-fired power plant. "We shut it down and laid it up in case someone wanted to reuse it."¶ That's not likely to happen anytime soon—or as Spitznogle puts it: "There'd have to be a reason more than just a deep scientific fascination with doing it." New projects are underway in the U.S.—the Plant Barry project in Alabama is capturing CO2 and burying it in an old oil field, and a new coal-fired power plant with CCS is being built in Kemper County, Miss. But progress on CCS for coal-fired power plants in the U.S. has slowed for one major reason: natural gas.¶ Coal plants are shutting down because of a rise in the availability of cheap natural gas, largely as a result of hydraulic fracturing, which is opening up new deposits of the fuel in places such as the Marcellus Shale Formation in Pennsylvania. That's good news for the global climate because burning natural gas emits roughly half as much CO2 as burning coal. But it's also bad news for the climate because burning natural gas still emits CO2. "There are more than enough discovered hydrocarbons that if we burn them, we fry the planet," Lord Nicholas Stern told this reporter at the Durban climate conference last December while discussing carbon capture and storage. "You can do CCS or you can bust the 2-degree target."¶ As a result of the shale gas revolution in the U.S., the bulk of new CCS projects worldwide are in China, which hopes to become a leader in the technology. Carbon capture and storage even snuck into the Communist Party's 12th Five-Year Plan. Eleven projects are under development across the country, ranging from advanced coal-fired power plants to a chemical plant that will turn coal into liquid fuel.¶ The Chinese are even considering investing in a CCS project in Texas, known as the Texas Clean Energy Project. But the key there, as in most ongoing projects, is not a price on CO2 pollution that emitters want to avoid, but a price on CO2 that is used to help get more oil out of the ground—a process known as "enhanced oil recovery," a potentially large market given the world's thirst for petroleum.

#### CCS can’t get off the ground even with government support

Hone 12 (David, Senior Climate Change Advisor for Royal Dutch Shell, Chairman of the International Emissions Trading Association (IETA), “Encouraging CCS in Europe,” Aug 3, [http://theenergycollective.com/davidhone/99781/encouraging-ccs-europe?utm\_source=feedburnerandutm\_medium=emailandutm\_campaign=The+Energy+Collective+%28all+posts%29])

All this still points to the need for some CCS activity in Europe this decade and for project development to proceed next decade for startup around 2030 (at the very latest). It may also be the case that a need for deeper cuts in emissions brings CCS forward.¶ The question of how to promote CCS activity today, in the midst of difficult economic times and carbon markets that are clearly not calling for it, is discussed in a new report issued today by the European Technology Platform for Zero Emission Fossil Fuel Power Plants (ZEP).The ZEP report, Creating a Secure Environment for Investment in Europe, looks comprehensively at short (through to 2020), medium (the 2020s) and long term (post 2030) measures. In the short term the focus must be on recalibrating the ETS, but the report also calls for a number of the measures similar (but not necessarily identical) to those being implemented in the UK as part of the Electricity Market Reform. CCS Feed-In Tariffs, CCS Purchase Contracts and CCS Capacity Payments are all discussed. These measures could also continue in some form into the 2020s, but securing early clarity on 2030 and 2040 EU carbon targets is seen as the key priority for the medium term. For the longer term, the 2050 emissions target is the key driver, but the introduction of an auction reserve price for ETS allowances post 2030 would provide investment certainty for large scale project decisions made in the 2020s. Such investments would be exposed to the prevailing carbon price in the 2030s and beyond.¶ The EU has put considerable effort into stimulating CCS, but the goal of early demonstration has proved to be intractable. The ZEP report provides some further thinking on the issue and because of the ZEP constituency, is backed by industry, academia and NGOs.

#### No new coal plants – utilities are investing into natty

Plumer 12 (Brad, reporter focusing on energy on environmental issues at the Washington Post, previously an associate editor at The New Republic, contributor to Ezra Klein’s ‘WonkBlog’, "Why EPA’s new carbon rules won’t have much impact — for now," Mar 27, [http://www.washingtonpost.com/blogs/ezra-klein/post/how-much-carbon-will-the-epas-new-power-plant-rules-actually-cut/2012/03/27/gIQAuaTDeS\_blog.html/], jam)

On Tuesday, the Environmental Protection Agency unveiled its first-ever rules on carbon-dioxide emissions from new power plants. These rules are part of the EPA’s program to tackle global-warming pollution. But what sort of impact will they actually have? Not a whole lot — at least for the foreseeable future. First, a quick refresher: These latest carbon rules are the third step in the EPA’s ongoing effort to regulate greenhouse gases under the Clean Air Act. The first two phases involved setting stricter fuel-economy standards for cars and light trucks. Today’s rule, which falls under the New Source Performance Standard portion of the law, sets rules for power plants that haven’t been built yet. The rule, in short, is this: Any new plant built in the United States will have to emit no more than1,000 pounds of carbon-dioxide per megawatt-hour. The vast majority of modern natural-gas plants meet that standard, so they should be fine. Conventional coal plants, however, average upward of 1,800 pounds per megawatt-hour. They’re not so fine. This effectively means, analysts agree, that it will be impossible to build any new coal-fired power plant in the United States that can’t capture and store its own carbon emissions. Right now, there are two carbon-capture projects in development, one out in West Virginia and one in Texas, but the technology is still costly and unproven. For the time being, then, this is a moratorium on all new coal plants. Practically, though, that might not have a huge impact in the short term. The rule won’t affect existing power plants, and it won’t affect any coal-fired plants that are already permitted or set to begin construction within a year. According to a Department of Energy report (pdf), there are 24 such plants in the works. This rule would affect any future coal-fired plants — but right now there are hardly any such plants being planned in the United States. In recent years, utilities have been shifting away from coal on their own, largely due to other pollution regulations and the influx of cheap natural gas. The Energy Information Adminstration was already projecting that no coal plants would come online between 2017 and 2035. So this latest rule might be mostly symbolic — a way of recognizing that global warming is a problem but not taking dramatic steps to cut emissions further. Conventional coal-fired plants were looking increasingly uneconomical anyway, and the EPA’s rules mostly codify that trend. (On the other hand, as Grist’s Dave Roberts notes in his excellent primer, these rules might matter if natural gas prices were to ever spike again. In that case, these EPA rules would require utilities to seek out either renewables, nuclear power, or coal with carbon-capture as alternatives.) Meanwhile, this rule is only a first step. The EPA is still mulling over how to deal with existing power plants under a different section of the New Source Performance Standards program, section 111(d), that governs otherwise-unregulated pollutants. Details on these latter regulations are still murky, and it’s not clear when they’ll emerge.\* In theory, the EPA has a lot of flexibility under section 111(d) and could even give states the authority to set up a cap-and-trade system for existing plants. Yet many analysts think that option is unlikely. “The EPA has had a series of listening sessions on this topic,” said William Bumpers, a lawyer with Baker Botts, in a recent interview. “But it’s still struggling to develop these rules.” Beyond that, the EPA is also crafting carbon regulations for oil refineries and other stationary pollution sources. All of these future rules could matter a lot: A 2010 report from the World Resources Institute found that the EPA’s carbon rules, when fully deployed, could cover about three-quarters of the country’s greenhouse-gas sources and reduce U.S. carbon emissions anywhere from 5 percent to 12 percent below 2005 levels by 2020. For reference, the Obama administration pledged a 17 percent cut at the Copenhagen climate change conference. But that’s only if the rules are used to their fullest extent. For the time being, the EPA is just a little bit of the way there.

#### No CCP collapse—the government represses instability

Pei 9 (Minxin, Senior Associate in the China Program at the Carnegie Endowment for International Peace, 3/12. “Will the Chinese Communist Party Survive the Crisis?” Foreign Affairs. http://www.foreignaffairs.com/articles/64862/minxin-pei/will-the-chinese-communist-party-survive-the-crisis)

It might seem reasonable to expect that challenges from the disaffected urban middle class, frustrated college graduates, and unemployed migrants will constitute the principal threat to the party's rule. If those groups were in fact to band together in a powerful coalition, then the world's longest-ruling party would indeed be in deep trouble. But that is not going to happen. Such a revolutionary scenario overlooks two critical forces blocking political change in China and similar authoritarian political systems: the regime's capacity for repression and the unity among the elite. Economic crisis and social unrest may make it tougher for the CCP to govern, but they will not loosen the party's hold on power. A glance at countries such as Zimbabwe, North Korea, Cuba, and Burma shows that a relatively unified elite in control of the military and police can cling to power through brutal force, even in the face of abysmal economic failure. Disunity within the ruling elite, on the other hand, weakens the regime's repressive capacity and usually spells the rulers' doom. The CCP has already demonstrated its remarkable ability to contain and suppress chronic social protest and small-scale dissident movements. The regime maintains the People's Armed Police, a well-trained and well-equipped anti-riot force of 250,000. In addition, China's secret police are among the most capable in the world and are augmented by a vast network of informers. And although the Internet may have made control of information more difficult, Chinese censors can still react quickly and thoroughly to end the dissemination of dangerous news. Since the Tiananmen crackdown, the Chinese government has greatly refined its repressive capabilities. Responding to tens of thousands of riots each year has made Chinese law enforcement the most experienced in the world at crowd control and dispersion. Chinese state security services have applied the tactic of "political decapitation" to great effect, quickly arresting protest leaders and leaving their followers disorganized, demoralized, and impotent. If worsening economic conditions lead to a potentially explosive political situation, the party will stick to these tried-and-true practices to ward off any organized movement against the regime.

#### CCS down – natty, no investment

Volcovici 12 (Valerie, Reuters, Shale boom derails U.S. investments in clean coal technology, 10/18/12 <http://www.reuters.com/article/2012/10/18/usa-coal-natgas-idUSL1E8LFFNL20121018>)

Undercut by competition from cheap and cleaner-burning natural gas, analysts believe the expensive technology needed to make "clean coal" plants is unlikely to become commercialized in the United States without heavy government subsidies.¶ To remain part of the long-term energy mix, coal plants need to invest in systems that capture carbon dioxide emissions from coal-fired power plants and bury the emissions underground to keep them out of the atmosphere -- technology known as carbon capture and storage (CCS).¶ Coal used to account for more than half of U.S. power production, but that has shrunk to only a bit more than a third. CCS was touted as a way to keep coal jobs in the United States, but the technology's heavy reliance on financial, political and regulatory support has deterred progress.¶ Meanwhile, breakthroughs in horizontal drilling techniques and hydraulic fracturing, or fracking, have unlocked massive gas reserves trapped in shale formations, prompting a major shift away from using coal at power and industrial plants.¶ "Unquestionably, without a carbon price and with low natural gas prices these technologies are having problems drawing investment and attention," said Tim Profeta, director of the Nicholas Institute of Environmental Policy at Duke University.¶ President Barack Obama and Republican presidential candidate Mitt Romney have both pledged their support for "clean coal" on the campaign trail, but both campaigns have been short on details about how to pay for CCS.¶ Between the availability of cheap natural gas and the worsening fiscal crisis in Washington, the government has little incentive to prioritize these investments, Profeta said.

#### US CCS fails – R&D blunders, natty, enviro concerns

Yang 12 (Catherine, National Geographic, Amid U.S.-China Energy Tension, "Clean Coal" Spurs Teamwork, http://news.nationalgeographic.com/news/energy/2012/12/120213-us-china-teamwork-on-clean-coal/)

Although the United States has poured billions of dollars into CCS research and development over 25 years, progress has been halting, and several high-profile projects have been abandoned due to high costs. The building of coal power plants has been so slowed by environmental concerns and the rise of natural gas as an alternative that the United States has not proven to be a fertile ground for accelerating CCS.

#### Chinese coal gasification solves

Yang 12 (Catherine, National Geographic, Amid U.S.-China Energy Tension, "Clean Coal" Spurs Teamwork, http://news.nationalgeographic.com/news/energy/2012/12/120213-us-china-teamwork-on-clean-coal/)

China took the lead from the United States as the world's top carbon emitter in recent years, but China deems clean technology a national priority, spelled out in its 12th Five-Year Plan (2011-2015). Big state-owned enterprises, such as the electric generation giant Huaneng Group and Shenhua Group, China's largest coal-mining firm, are investing heavily in technologies, especially coal gasification. Capturing the CO2 from gasified coal has advantages over technologies that aim to capture CO2 after combustion from the power plant flue, where it is mixed with other gases and contaminants. China has been working on both pre-combustion and post-combustion carbon capture, but it's been expensive to develop.¶ China's fast-growing coal industry, however, has been investing the funds. "Projects of $1 to $2 billion apiece are just noise there," says Armond Cohen, founder of the Clean Air Task Force (CATF), a Boston-based nonprofit that brokers partnerships between U.S. and Chinese clean tech companies. "In the U.S., we could live off the fumes and table scraps" from China's megaprojects, he said.

## 1AR

### Case

#### 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 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.

### CCS DA

#### China growth unsustainable—aging demographics

Liang 12-25 James Liang, “Dealing with an Old Problem,” Caixin, 12/25/2012, http://english.caixin.com/2012-12-25/100476434\_all.html

From the end of WWII to today, Japan's fertility rate has fallen from 4 births per woman 1.3 births. This is far lower than that of the U.S., at 2.1 births per woman. That is to say, as Japan's newborn population continues to dwindle, young people as a proportion of the total population are shrinking. This has become a great disadvantage in terms of economic competitiveness. A decline in the fertility rate impedes the growth of new companies not just because of the absolute decline of young people but because more mature structures require more resources. The elderly constitute a powerful voting bloc so social resources and benefits will tilt in their favor. Once when I was flying out of Japan, I noticed that there were three pairs of glasses at different prescription levels available for airline passengers at the customs office. I couldn't help but see them as a sign of a shift in society. When a Japanese person retires, they will still enjoy 70 percent of his previous wages at work, far higher than the salaries of young people just starting their career. This is enviable. The government's taxation and corporate seniority system virtually put the economic output created by the young to directly to the elderly. Under such circumstances, it's hard for Japanese youth to have any chance of getting ahead. In the 1970s, 32 percent of mid-level division managers in Japanese firms were under 35 years old. This figure dropped to 16 percent in the 1990s. At higher managerial levels, there used to be 25 percent of managers under the age of 45 years, whereas this number dropped to less than 8 percent in the 1990s. Turning to China In the past when people analyzed the gloom and doom of the Japanese economy they usually focused on factors such as the changes in exchange rates and the economic policies, but they ignored Japan's demographic structure. It's particularly worth noting that when policies deviate, it's possible they can be corrected in the short term. However, the correction of population issues uniquely imposes much higher long-term costs. Today's population policy has its impact on the ratio of youngsters only in 20 or 30 years' time. Were Japan able to use a time machine presumably they would have chosen to launch a fertility policy decades ago. Japan is now desperately trying to encourage child-bearing so as to fight its way out of the rapidly-aging demographic structure. Meanwhile, as the country's 2010 population census showed, China has a 1.2 fertility rate and is still implementing the one-child policy that limits childbearing. Such a contrast looks particularly glaring. Perhaps the gaze of Chinese policymakers remains fixed upon the crowds filling up Beijing and Shanghai's subways, and they are concerned that China has an overpopulation problem. The effect of a population policy takes time to show its results. This is why policymakers must keep in mind that the formulation of policy today must correspond to estimates in 20 or 30 year's time. If China maintains the current fertility rate, its demographic structure by 2040 will be nearly the same compared to Japan today. The series of issues that Japanese society must reckon with are likely to befall us.

#### China’s economy is resilient – Asian financial crisis proves

Steven F. Jackson, Assoc. Prof and Chair Poly Sci @ Indiana U Penn, 2000, Is China Unstable? Ed. Shambuagh

These problems, however, do not necessarily mean that China is on the verge of economic collapse—far from it. As Pieter Bottelier demonstrates, China possesses some substantial economic advantages. First and foremost, China is not directly vulnerable to the Asian financial crisis in the ways that other countries in the region have been. China’s massive foreign exchange reserves of $144 billion, minimal short-term debt exposure, and its current account surplus provides the ability to ride out short-term trade deficits. China also does not have a freely convertible currency for capital account transfers or a large amount of short- term debt as did South Korea, and thus the Renminbi (RMB) is not vulnerable to monetary speculation in the ways that the rupiah, won, baht, yen, and other currencies have been in the last year. In fact, the RMB has appreciated against the U.S. dollar, the only Asian currency to do so. In short, Bottelier concludes, “...the probability of instability in China due to external economic pressures or macroeconomic imbalances remains low.” Second, China continues to have a high rate of GDP growth, though it has slowed in recent years. The key question is whether the government can maintain a rate of growth around 8 percent. Third, rural discontentment notwithstanding (see below), harvests in China have been good for the past three years and grain stocks are at an all-time high, a relief for any nation which must feed 1.3 billion people. Externally, China has great strengths, but internally it must solve its financial problem before it becomes a crisis.