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### 1AC—Adv 1

**Advantage One---The DOD**

**Domestic DOD bases are vulnerable due to connectivity to the civilian grid.**

**Robitaille 12** (George, Department of Army Civilian & US Army War College, *Small Modular Reactors: The Army’s Secure Source of Energy?*, March, Strategy Research Project)

In recent years, the U.S Department of Defense (DoD) has identified a security issue at our installations related to the dependence on the civilian electrical grid. 1 The DoD depends on a steady source of electricity at military facilities to perform the functions that secure our nation. The flow of electricity into military facilities is controlled by a public grid system that is susceptible to being compromised because of the age of the infrastructure, damage from **natural disasters** and the potential for **cyber attacks**. Although most major functions at military installations employ diesel powered generators as temporary backup, the public grid may not be available to provide electricity when it is needed the most. The United States electrical infrastructure system is prone to failures and susceptible to **terrorist attacks**. 2 It is critical that the source of electricity for our installations is reliable and secure. In order to ensure that our military facilities possess a secure source of electricity, either the public system of electric generation and distribution is upgraded to increase its reliability as well as reducing its susceptibility to cyber attack or another source of electricity should be pursued. Although significant investments are being made to upgrade the electric grid, the current **investment levels** are not keeping up with the aging system. Small modular reactors (SMRs) are nuclear reactors that are about an order of magnitude smaller than traditional commercial reactor used in the United States. SMRs are capable of generating electricity and at the same time, they are not a significant contributor to global warming because of green house gas emissions. The DoD needs to look at small modular nuclear reactors (SMRs) to determine if they can provide a safe and secure source of electricity. Electrical Grid Susceptibility to Disruptions According to a recent report by the Defense Science Board, the DoD gets ninety nine percent of their electrical requirements from the civilian electric grid. 3 The electric grid, as it is currently configured and envisioned to operate for the foreseeable future, may not be reliable enough to ensure an uninterrupted flow of electricity for our critical military facilities given the influences of the aging infrastructure, its susceptibility to severe weather events, and the potential for cyber attacks. The DoD dependency on the grid is reflected in the $4.01 Billion spent on facilities energy in fiscal year 2010, the latest year which data was available. 4 The electricity used by military installations amounts to $3.76 billion. 5 As stated earlier, the DoD relies on the commercial grid to provide a secure source of energy to support the operations that ensure the security of our nation and it may not be available when we need it. The system could be taken down for extended periods of time by failure of aging components, acts of nature, or intentionally by cyber attacks. Aging Infrastructure. The U.S electric power grid is made up of independently owned power plants and transmission lines. The political and environmental resistance to building new electric generating power plants combined with the rise in consumption and aging infrastructure increases the potential for grid failure in the future. There are **components** in the U.S. electric grid that are over one hundred years old and some of the recent outages such as the 2006 New York blackout can be directly attributed to this out of date, aging infrastructure. 6 Many of the components of this system are at or exceeding their operational life and the general trend of the utility companies is to not replace power lines and other equipment until they fail. 7 The government led deregulation of the electric utility industry that started in the mid 1970s has contributed to a three decade long deterioration of the electric grid and an increased state of instability. Although significant investments are being made to upgrade the electric grid, the many years of prior neglect will require a considerable amount of time and funding to bring the aging infrastructure up to date. Furthermore, the current investment levels to upgrade the grid are not keeping up with the aging system. 8 In addition, **upgrades** to the digital infrastructure which were done to increase the systems efficiency and reliability, have actually made the system more susceptible to cyber attacks. 9 Because of the aging infrastructure and the impacts related to weather, the extent, as well as frequency of failures is expected to increase in the future. Adverse Weather. According to a 2008 grid reliability report by the Edison Electric Institute, sixty seven per cent of all power outages are related to **weather**. Specifically, lightning contributed six percent, while adverse weather provided thirty one percent and vegetation thirty percent (which was predominantly attributed to wind blowing vegetation into contact with utility lines) of the power outages. 10 In 1998 a falling tree limb damaged a transformer near the Bonneville Dam in Oregon, causing a cascade of related black-outs across eight western states. 11 In August of 2003 the lights went out in the biggest blackout in North America, plunging over fifty million people into darkness over eight states and two Canadian provinces. Most areas did not have power restored four or five days. In addition, drinking water had to be distributed by the National Guard when water pumping stations and/or purification processes failed. The estimated economic losses associated with this incident were about five billion dollars. Furthermore, this incident also affected the operations of twenty two nuclear plants in the United States and Canada. 12 In 2008, Hurricane Ike caused approximately seven and a half million customers to lose power in the United States from Texas to New York. 13 The electric grid suffered numerous power outages every year throughout the United States and the number of outages is expected to increase as the infrastructure ages without sufficient upgrades and weather-related impacts continue to become more frequent. Cyber Attacks. The civilian grid is made up of three unique electric networks which cover the East, West and Texas with approximately one hundred eighty seven thousand miles of power lines. There are several weaknesses in the electrical distribution infrastructure system that could compromise the flow of electricity to military facilities. The flow of energy in the network lines as well as the main distribution hubs has become totally dependent on **computers** and internet-based communications. Although the digital infrastructure makes the grid more efficient, it also makes it more susceptible to cyber attacks. Admiral Mr. Dennis C. Blair (ret.), the former Director of National Intelligence, testified before Congress that “the growing connectivity between information systems, the Internet, and other infrastructures creates opportunities for attackers to disrupt telecommunications, electrical power, energy pipelines, refineries, financial networks, and other critical infrastructures. 14 ” The Intelligence Community assesses that a number of nations already have the technical capability to conduct such attacks. 15 In the 2009 report, Annual Threat Assessment of the Intelligence Community for the Senate Armed Services Committee, Adm. Blair stated that “Threats to cyberspace pose one of the most serious economic and national security challenges of the 21st Century for the United States and our allies.”16 In addition, the report highlights a growing array of state and non-state actors that are targeting the U.S. critical infrastructure for the purpose of creating chaos that will subsequently produce detrimental effects on citizens, commerce, and government operations. These actors have the ability to compromise, steal, change, or completely destroy information through their detrimental activities on the internet. 17 In January 2008, US Central Intelligence Agency senior analyst Tom Donahue told a gathering of three hundred international security managers from electric, water, oil & gas, and other critical industry, that data was available from multiple regions outside the United States, which documents cyber intrusions into utilities. In at least one case (outside the U.S.), the disruption caused a power outage affecting multiple cities. Mr. Donahue did not specify who executed these attacks or why, but did state that all the intrusions were conducted via the Internet. 18 During the past twenty years, advances in computer technologies have permeated and advanced all aspects of our lives. Although the digital infrastructure is being increasingly merged with the power grid to make it more efficient and reliable, it also makes it more vulnerable to cyber attack. In October 2006, a foreign hacker invaded the Harrisburg, PA., water filtration system and planted malware. 19 In June 2008, the Hatch nuclear power plant in Georgia shut down for two days after an engineer loaded a software update for a business network that also rebooted the plant's power control system. In April 2009, The Wall Street Journal reported that cyber spies had infiltrated the U.S. electric grid and left behind software that could be used to disrupt the system. The hackers came from China, Russia and other nations and were on a “fishing expedition” to map out the system. 20 According to the secretary of Homeland Security, Janet Napolitano at an event on 28 October 2011, cyber–attacks have come close to compromising the country’s critical infrastructure on multiple occasions. 21 Furthermore, during FY11, the United States Computer Emergency Readiness Team took action on more than one hundred thousand incident reports by releasing more than five thousand actionable cyber security alerts and information products. 22 The interdependence of modern infrastructures and digital based systems makes any cyber attacks on the U.S. electric grid potentially significant. The December 2008 report by the Commission on Cyber Security for the forty fourth Presidency states the challenge plainly: “America’s failure to protect cyberspace is one of the most urgent national security problems facing the new administration”. 23 The susceptibility of the grid to being compromised has resulted in a significant amount of resources being allocated to ensuring the systems security. Although a substantial amount of resources are dedicated to protecting the nation’s infrastructure, it may not be enough to ensure the continuous flow of electricity to our critical military facilities. SMRs as they are currently envisioned may be able to provide a secure and independent alternative source of electricity in the event that the public grid is compromised. SMRs may also provide additional DoD benefit by supporting the recent government initiatives related to energy consumption and by circumventing the adverse ramifications associated with building coal or natural gas fired power plants on the environment.

**SMR’s solve. They address weaknesses which otherwise leads to nuclear retaliation.**

**Andres 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. Breetz – 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*, Strategic Forum, National Defense University, Institute for National Strategic Studies, February 2011, http://www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf)

Small reactors and energy Security The DOD interest in small reactors derives largely from problems with base and logistics vulnerability. Over the last few years, the Services have begun to reexamine virtually every aspect of how they generate and use en- ergy with an eye toward cutting costs, decreasing carbon emissions, and reducing energy-related vulnerabilities. These actions have resulted in programs that have signif- icantly reduced DOD energy consumption and green- house gas emissions at domestic bases. Despite strong efforts, however, two critical security issues have thus far proven resistant to existing solutions: bases’ vulnerability to civilian power outages, and the need to transport large quantities of fuel via convoys through hostile territory to forward locations. Each of these is explored below. 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 re- port sponsored by the Department of Homeland Secu- rity suggests that a coordinated cyber attack 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 func- tion 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 black- out could **escalate to nuclear war**. America’s current opponents, however, may not share this fear or be deterred by this possibility. 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 ef- forts 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 renew- ables, 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 de- mands 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.

**That causes nuclear world war three.**

**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 Escalation*, May 13th 2009, http://www.seanlawson.net/?p=477)

Introduction 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 makerÃ¢â‚¬â„¢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]: 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] Asked by the New York Times to comment on this, U.S. defense officials would not deny that nuclear retaliation remains an option for response to a massive cyberattack: “Pentagon and military officials confirmed that the United States reserved the option to respond in any way it chooses to punish an adversary responsible for a catastrophic cyberattack. While the options could include the use of nuclear weapons, officials said, such an extreme counterattack was hardly the most likely response.” [8] The rationale for this policy: “Thus, the United States never declared that it would be bound to respond to a Soviet and Warsaw Pact conventional invasion with only American and NATO conventional forces. The fear of escalating to a nuclear conflict was viewed as a pillar of stability and is credited with helping deter the larger Soviet-led conventional force throughout the cold war. Introducing the possibility of a nuclear response to a catastrophic cyberattack would be expected to serve the same purpose.” [9] Non-unique, Dangerous, and In-credible? There are a couple of interesting things to note in response. First is the development of a new acronym, WMD/E (weapons of mass destruction or effect). Again, this acronym indicates a weakening of the requirement of physical impacts. In this new definition, mass effects that are not necessarily physical, nor necessarily destructive, but possibly only disruptive economically or even psychologically (think “shock and awe”) are seen as equivalent to WMD. This new emphasis on effects, disruption, and psychology reflects both contemporary, but also long-held beliefs within the U.S. defense community. It reflects current thinking in U.S. military theory, in which it is said that U.S. forces should be able to “mass fires” and “mass effects” without having to physically “mass forces.” There is a sliding scale in which the physical (often referred to as the “kinetic”) gradually retreats–i.e. massed forces are most physical; massed fire is less physical (for the U.S. anyway); and massed effects are the least physical, having as the ultimate goal Sun Tzu’s “pinnacle of excellence,” winning without fighting. But the emphasis on disruption and psychology in WMD/E has also been a key component of much of 20th century military thought in the West. Industrial theories of warfare in the early 20th century posited that industrial societies were increasingly interdependent and reliant upon mass production, transportation, and consumption of material goods. Both industrial societies and the material links that held them together, as well as industrial people and their own internal linkages (i.e. nerves), were seen as increasingly fragile and prone to disruption via attack with the latest industrial weapons: airplanes and tanks. Once interdependent and fragile industrial societies were hopelessly disrupted via attack by the very weapons they themselves created, the nerves of modern, industrial men and women would be shattered, leading to moral and mental defeat and a loss of will to fight. Current thinking about the possible dangers of cyber attack upon the U.S. are based on the same basic premises: technologically dependent and therefore fragile societies populated by masses of people sensitive to any disruption in expected standards of living are easy targets. Ultimately, however, a number of researchers have pointed out the pseudo-psychological, pseudo-sociological, and a-historical (not to mention non-unique) nature of these assumptions. [10] Others have pointed out that these assumptions did not turn out to be true during WWII strategic bombing campaigns, that modern, industrial societies and populations were far more resilient than military theorists had assumed. [11] Finally, even some military theorists have questioned the assumptions behind cyber war, especially when assumptions about our own technology dependence-induced societal fragility (dubious on their own) are applied to other societies, especially non-Western societies (even more dubious). [12] Finally, where deterrence is concerned, it is important to remember that a deterrent has to be credible to be effective. True, the U.S. retained nuclear weapons as a deterrent during the Cold War. But, from the 1950s through the 1980s, there was increasing doubt among U.S. planners regarding the credibility of U.S. nuclear deterrence via the threat of “massive retaliation.” As early as the 1950s it was becoming clear that the U.S. would be reluctant at best to actually follow through on its threat of massive retaliation. Unfortunately, most money during that period had gone into building up the nuclear arsenal; conventional weapons had been marginalized. Thus, the U.S. had built a force it was likely never to use. So, the 1960s, 1970s, and 1980s saw the development of concepts like “flexible response” and more emphasis on building up conventional forces. This was the big story of the 1980s and the “Reagan build-up” (not “Star Wars”). Realizing that, after a decade of distraction in Vietnam, it was back in a position vis-a-viz the Soviets in Europe in which it would have to rely on nuclear weapons to offset its own weakness in conventional forces, a position that could lead only to blackmail or holocaust, the U.S. moved to create stronger conventional forces. [13] Thus, the question where cyber war is concerned: If it was in-credible that the U.S. would actually follow through with massive retaliation after a Soviet attack on the U.S. or Western Europe, is it really credible to say that the U.S. would respond with nuclear weapons to a cyber attack, no matter how disruptive or destructive? Beyond credibility, deterrence makes many other assumptions that are problematic in the cyber war context. It assumes an adversary capable of being deterred. Can most of those who would perpetrate a cyber attack be deterred? Will al-Qa’ida be deterred? How about a band of nationalistic or even just thrill-seeker, bandwagon hackers for hire? Second, it assumes clear lines of **command and control**. Sure, some hacker groups might be funded and assisted to a great degree by states. But ultimately, even cyber war theorists will admit that it is doubtful that states have complete control over their armies of hacker mercenaries. How will deterrence play out in this kind of scenario?

**And attacks collapse the militaries war fighting capability.**

**Loudermilk 11** (Micah, Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University*, Small Nuclear Reactors: Enabling Energy Security for Warfighters*, Small Wars Journal, March 27th 2011, http://smallwarsjournal.com/blog/small-nuclear-reactors-enabling-energy-security-for-warfighters)

Last month, the Institute for National Strategic Studies at National Defense University released a report entitled Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications. Authored by Dr. Richard Andres of the National War College and Hanna Breetz from Harvard University, the paper analyzes the potential for the Department of Defense to incorporate small reactor technology on its domestic military bases and in forward operating locations. According to Andres and Breetz, the reactors have the ability to solve two critical vulnerabilities in the military's mission: the dependence of domestic bases on the civilian electrical grid and the challenge of supplying ample fuel to troops in the field. Though considerable obstacles would accompany such a move -- which the authors openly admit -- the benefits are significant enough to make the idea merit serious consideration. At its heart, a discussion about military uses of small nuclear reactors is really a conversation about securing the nation's war fighting capabilities. Although the point that energy security **is** national security has become almost redundant -- quoted endlessly in government reports, think tank papers, and the like -- it is repeated for good reason. Especially on the domestic front, the need for energy security on military bases is often overlooked. There is no hostile territory in the United States, no need for fuel convoys to constantly supply bases with fuel, and no enemy combatants. However, while bases and energy supplies are not directly vulnerable, the civilian electrical grid on which they depend for 99% of their energy use is -- and that makes domestic installations highly insecure. The U.S. grid, though a technological marvel, is extremely old, brittle, and susceptible to a wide variety of problems that can result in power outages -- the 2003 blackout throughout the Northeast United States is a prime example of this. In the past, these issues were largely limited to accidents including natural disasters or malfunctions, however today, intentional threats such as cyber attacks represent a very real and growing threat to the grid. Advances in U.S. military technology have further increased the risk that a grid blackout poses to the nation's military assets. As pointed out by the Defense Science Board, **critical missions** including national strategic awareness and national command authorities depend on the national transmission grid. Additionally, capabilities vital to troops in the field -- including drones and satellite intelligence/reconnaissance -- are lodged at bases within the United States and their loss due to a blackout would **impair the ability** of troops to operate in forward operating areas. Recognition of these facts led the Defense Science Board to recommend "islanding" U.S. military installations to mitigate the electrical grid's vulnerabilities. Although DOD has undertaken a wide array of energy efficiency programs and sought to construct renewable energy facilities on bases, these endeavors will fall far short of the desired goals and still leave bases unable to function in the event of long-term outages. As the NDU report argues though, small nuclear reactors have the potential to alleviate domestic base grid vulnerabilities. With a capacity of anywhere between 25 and 300 megawatts, small reactors possess sufficient generation capabilities to power any military installation, and most likely some critical services in the areas surrounding bases, should a blackout occur. Moreover, making bases resilient to civilian power outages would reduce the incentive for an opponent to disrupt the grid in the event of a conflict as military capabilities would be unaffected. Military bases are also secure locations, reducing the associated fears that would surely arise from the distribution of reactors across the country. Furthermore, small nuclear reactors, by design, are significantly safer than prior generations of reactors due to passive safety features, simplified designs, sealed reactor cores, and lower operational requirements.

**Conventional wars are inevitable. Ineffectiveness leads to major power aggression and violent competition.**

**Horowitz 9** (Michael C. Horowitz and Dan A. Shalmon, Professor of Political Science @ University of Pennsylvania & Senior Analyst @ Lincoln Group, LLC. *The Future of War and American Military Strategy*, Orbis, Spring 2009)

It is important to recognize at the outset two key points about United States strategy and the potential costs and benefits for the United States in a changing security environment. First, the United States is very likely to remain fully engaged in global affairs. Advocates of restraint or global withdrawal, while popular in some segments of academia, remain on the **margins** of policy debates in Washington D.C. This could always change, of course. However, at present, **it is a given** that the United States will define its interests globally and pursue a strategy that requires capable military forces able to project power around the world. Because ‘‘indirect’’ counter-strategies are the rational choice for actors facing a strong state’s power projection, irregular/asymmetric threats are inevitable given America’s role in the global order.24 Second, the **worst-case scenario** is a loss of U.S. conventional superiority. Losing military control of the sea and the air, ‘‘the global commons,’’25 would render American global strategy **outmoded in an instant**. The idea that the United States must improve its capacity to fight counterinsurgency operations presumes a need to do so beyond defending the homeland and that the United States will have the capacity to intervene in future conflicts around the world. However, while it seems unlikely at present, what if developments in warfare cut down and then eliminated the conventional military superiority of the United States? The loss of conventional military superiority by the United States would probably make the current strategic environment **look like a picnic**.26 For example, currently a Marine unit deploying to Afghanistan or Iraq focuses most on the post-deployment battlefield tasks. However, imagine a world where commanders and soldiers, like their World War II forbears, must fear being sunk on a transport ship or shot out of the sky on the way over, or being targeted by electronic, nanotechnological, or directed energy or precision guided munitions when preparing to search a village for insurgents.27 In such a strategic environment, overseas deployments to win hearts and minds in a low intensity war or wipe out radical jihadi groups would likely—and logically— take a backseat to more ‘‘traditional’’ concerns: convoys, tank battles, air and coastal defenses, and crash programs to build a new generation of naval and air weapons to take back the seas and skies. Meanwhile, in the interim, the United States homeland would be more at risk than at any point since the World War II—arguably more threatened than in its entire history. What John Mearsheimer has called the ‘‘stopping power of water’’ previously functioned to shield the United States, with its oceanic buffers to the east and west, from existential threats. However, in the information age and if the United States no longer controls the waterways of the world, water may not be enough. A world without American conventional military superiority would also **encourage aggression** by regional actors eager to settle scores and take advantage of the fact that the United States could no longer destroy their military forces at a low cost, to say nothing of the global dangers inherent in the **competition among major powers** that could result. The latter scenario is the worst case and it bears mentioning only because it should inform the framework in which any debate about defense strategy occurs. Pg. 307-308

**That competition goes nuclear.**

**Kagan 7** (Frederick Kagan and Michael O’Hanlon 7, Fred’s a resident scholar at AEI, Michael is a senior fellow in foreign policy at Brookings, “The Case for Larger Ground Forces”, April, <http://www.aei.org/files/2007/04/24/20070424_Kagan20070424.pdf>)

We live at a time when wars not only rage in nearly **every region** but threaten to erupt in many places where the current relative calm is tenuous. To view this as a strategic military challenge for the United States is not to espouse a specific theory of America’s role in the world or a certain political philosophy. Such an assessment flows directly from the basic bipartisan view of American foreign policy makers since World War II that overseas threats must be countered before they can directly threaten this country’s shores, that the basic stability of the international system is essential to American peace and prosperity, and that no country besides the United States is in a position to lead the way in countering major challenges to the global order. Let us highlight the threats and their consequences with a few concrete examples, emphasizing those that involve key strategic regions of the world such as the Persian **Gulf** and **East Asia**, or key potential threats to American security, such as the spread of nuclear weapons and the strengthening of the global **Al Qaeda**/jihadist movement. The Iranian government has rejected a series of international demands to halt its efforts at enriching uranium and submit to international inspections. What will happen if the US—or Israeli—government becomes convinced that Tehran is on the verge of fielding a nuclear weapon? **North Korea**, of course, has already done so, and the ripple effects are beginning to spread. **Japan**’s recent election to supreme power of a leader who has promised to rewrite that country’s constitution to support increased armed forces—and, possibly, even nuclear weapons— may well alter the delicate balance of fear in Northeast Asia fundamentally and rapidly. Also, in the background, at least for now, **Sino Taiwanese** tensions continue to flare, as do tensions between **India and Pakistan**, **Pakistan and Afghanistan**, **Venezuela** and the United States, and so on. Meanwhile, the world’s nonintervention in Darfur troubles consciences from Europe to America’s Bible Belt to its bastions of liberalism, yet with no serious international forces on offer, the bloodletting will probably, tragically, continue unabated. And as bad as things are in Iraq today, they could get worse. What would happen if the key Shiite figure, Ali al Sistani, were to die? If another major attack on the scale of the Golden Mosque bombing hit either side (or, perhaps, both sides at the same time)? Such deterioration might convince many Americans that the war there truly was lost—but the costs of reaching such a conclusion would be enormous. Afghanistan is somewhat more stable for the moment, although a major Taliban offensive appears to be in the offing. Sound US grand strategy must proceed from the recognition that, over the next few years and decades, the world is going to be a very unsettled and quite dangerous place, with Al Qaeda and its associated groups as a subset of a much larger set of worries. The only serious response to this international environment is to develop armed forces capable of protecting America’s vital interests throughout this dangerous time. Doing so requires a military capable of a wide range of missions—including not only deterrence of great power conflict in dealing with potential hotspots in Korea, the Taiwan Strait, and the Persian Gulf but also associated with a variety of Special Forces activities and stabilization operations. For today’s US military, which already excels at high technology and is increasingly focused on re-learning the lost art of counterinsurgency, this is first and foremost a question of finding the resources to field a large-enough standing Army and Marine Corps to handle personnel intensive missions such as the ones now under way in Iraq and Afghanistan. Let us hope there will be no such large-scale missions for a while. But preparing for the possibility, while doing whatever we can at this late hour to relieve the pressure on our soldiers and Marines in ongoing operations, is prudent. At worst, the only potential downside to a major program to strengthen the military is the possibility of spending a bit too much money. Recent history shows no link between having a larger military and its overuse; indeed, Ronald Reagan’s time in office was characterized by higher defense budgets and yet much less use of the military, an outcome for which we can hope in the coming years, but hardly guarantee. While the authors disagree between ourselves about proper increases in the size and cost of the military (with O’Hanlon preferring to hold defense to roughly 4 percent of GDP and seeing ground forces increase by a total of perhaps 100,000, and Kagan willing to devote at least 5 percent of GDP to defense as in the Reagan years and increase the Army by at least 250,000), we agree on the need to start expanding ground force capabilities by at least 25,000 a year immediately. Such a measure is not only prudent, it is also badly overdue.

### 1AC—Adv 2

**Advantage Two---Warming**

**Warming is real and anthropogenic.**

**Prothero 12** (Donald R., Professor of Geology at Occidental College and Lecturer in Geobiology at the California Institute of Technology, 3-1-2012, "How We Know Global Warming is Real and Human Caused," Skeptic, 17.2, EBSCO)

How do we know that global warming is real and primarily human caused? There are numerous lines of evidence that converge toward this conclusion. 1. Carbon Dioxide Increase Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Litde Ice Age in the 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, the timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil. 2. Melting Polar Ice Caps The polar icecaps are thinning and breaking up at an alarming rate. In 2000, my former graduate advisor Malcolm McKenna was one of the first humans to fly over the North Pole in summer time and see no ice, just open water. The Arctic ice cap has been frozen solid for at least the past 3 million years (and maybe longer),[ 4] but now the entire ice sheet is breaking up so fast that by 2030 (and possibly sooner) less than half of the Arctic will be ice covered in the summer.[ 5] As one can see from watching the news, this is an ecological disaster for everything that lives up there, from the polar bears to the seals and walruses to the animals they feed upon, to the 4 million people whose world is melting beneath their feet. The Antarctic is thawing even faster. In February-March 2002, the Larsen B ice shelf -- over 3000 square km (the size of Rhode Island) and 220 m (700 feet) thick -- broke up in just a few months, a story -typical of nearly all the ice shelves in Antarctica. The Larsen B shelf had survived all the previous ice ages and interglacial warming episodes over the past 3 million years, and even the warmest periods of the last 10,000 years -- yet it and nearly all the other thick ice sheets on the Arctic, Greenland, and Antarctic are vanishing at a rate never before seen in geologic history. 3. Melting Glaciers Glaciers are all retreating at the highest rates ever documented. Many of those glaciers, along with snow melt, especially in the Himalayas, Andes, Alps, and Sierras, provide most of the freshwater that the populations below the mountains depend upon -- yet this fresh water supply is vanishing. Just think about the percentage of world's population in southern Asia (especially India) that depend on Himalayan snowmelt for their fresh water. The implications are staggering. The permafrost that once remained solidly frozen even in the summer has now thawed, damaging the Inuit villages on the Arctic coast and threatening all our pipelines to the North Slope of Alaska. This is catastrophic not only for life on the permafrost, but as it thaws, the permafrost releases huge amounts of greenhouse gases which are one of the major contributors to global warming. Not only is the ice vanishing, but we have seen record heat waves over and over again, killing thousands of people, as each year joins the list of the hottest years on record. (2010 just topped that list as the hottest year, surpassing the previous record in 2009, and we shall know about 2011 soon enough). Natural animal and plant populations are being devastated all over the globe as their environments change.[ 6] Many animals respond by moving their ranges to formerly cold climates, so now places that once did not have to worry about disease-bearing mosquitoes are infested as the climate warms and allows them to breed further north. 4. Sea Level Rise All that melted ice eventually ends up in the ocean, causing sea levels to rise, as it has many times in the geologic past. At present, the sea level is rising about 3-4 mm per year, more than ten times the rate of 0.1-0.2 mm/year that has occurred over the past 3000 years. Geological data show that the sea level was virtually unchanged over the past 10,000 years since the present interglacial began. A few mm here or there doesn't impress people, until you consider that the rate is accelerating and that most scientists predict sea levels will rise 80-130 cm in just the next century. A sea level rise of 1.3 m (almost 4 feet) would drown many of the world's low-elevation cities, such as Venice and New Orleans, and low-lying countries such as the Netherlands or Bangladesh. A number of tiny island nations such as Vanuatu and the Maldives, which barely poke out above the ocean now, are already vanishing beneath the waves. Eventually their entire population will have to move someplace else.[ 7] Even a small sea level rise might not drown all these areas, but they are much more vulnerable to the large waves of a storm surge (as happened with Hurricane Katrina), which could do much more damage than sea level rise alone. If sea level rose by 6 m (20 feet), most of the world's coastal plains and low-lying areas (such as the Louisiana bayous, Florida, and most of the world's river deltas) would be drowned. Most of the world's population lives in low-elevation coastal cities such as New York, Boston, Philadelphia, Baltimore, Washington, D.C., Miami, and Shanghai. All of those cities would be partially or completely under water with such a sea level rise. If all the glacial ice caps melted completely (as they have several times before during past greenhouse episodes in the geologic past), sea level would rise by 65 m (215 feet)! The entire Mississippi Valley would flood, so you could dock an ocean liner in Cairo, Illinois. Such a sea level rise would drown nearly every coastal region under hundreds of feet of water, and inundate New York City, London and Paris. All that would remain would be the tall landmarks such as the Empire State Building, Big Ben, and the Eiffel Tower. You could tie your boats to these pinnacles, but the rest of these drowned cities would lie deep underwater. Climate Change Critic's Arguments and Scientists' Rebuttals Despite the overwhelming evidence there are many people who remain skeptical. One reason is that they have been fed distortions and misstatements by the global warming denialists who cloud or confuse the issue. Let's examine some of these claims in detail: \* "It's just natural climatic variability." No, it is not. As I detailed in my 2009 book, Greenhouse of the Dinosaurs, geologists and paleoclimatologists know a lot about past greenhouse worlds, and the icehouse planet that has existed for the past 33 million years. We have a good understanding of how and why the Antarctic ice sheet first appeared at that time, and how the Arctic froze over about 3.5 million years ago, beginning the 24 glacial and interglacial episodes of the "Ice Ages" that have occurred since then. We know how variations in the earth's orbit (the Milankovitch cycles) controls the amount of solar radiation the earth receives, triggering the shifts between glacial and interglacial periods. Our current warm interglacial has already lasted 10,000 years, the duration of most previous interglacials, so if it were not for global warming, we would be headed into the next glacial in the next 1000 years or so. Instead, our pumping greenhouse gases into our atmosphere after they were long trapped in the earth's crust has pushed the planet into a "super-interglacial," already warmer than any previous warming period. We can see the "big picture" of climate variability most clearly in ice cores from the EPICA (European Project for Ice Coring in Antarctica), which show the details of the last 650,000 years of glacial-inters glacial cycles (Fig. 2). At no time during any previous interglacial did the carbon dioxide levels exceed 300 ppm, even at their very warmest. Our atmospheric carbon dioxide levels are already close to 400 ppm today. The atmosphere is headed to 600 ppm within a few decades, even if we stopped releasing greenhouse gases immediately. This is decidedly not within the normal range of "climatic variability," but clearly unprecedented in human history. Anyone who says this is "normal variability" has never seen the huge amount of paleoclimatic data that show otherwise. \* "It's just another warming episode, like the Medieval Warm Period, or the Holocene Climatic Optimum or the end of the Little Ice Age." Untrue. There were numerous small fluctuations of warming and cooling over the last 10,000 years of the Holocene. But in the case of the Medieval Warm Period (about 950-1250 A.D.), the temperatures increased only 1°C, much less than we have seen in the current episode of global warming (Fig. 1). This episode was also only a local warming in the North Atlantic and northern Europe. Global temperatures over this interval did not warm at all, and actually cooled by more than 1°C. Likewise, the warmest period of the last 10,000 years was the Holocene Climatic Optimum ( 5,000-9,000 B.C.E.) when warmer and wetter conditions in Eurasia contributed to the rise of the first great civilizations in Egypt, Mesopotamia, the Indus Valley, and China. This was largely a Northern Hemisphere-Eurasian phenomenon, with 2-3°C warming in the Arctic and northern Europe. But there was almost no warming in the tropics, and cooling or no change in the Southern Hemisphere.[ 8] From a Eurocentric viewpoint, these warming events seemed important, but on a global scale the effect was negligible. In addition, neither of these warming episodes is related to increasing greenhouse gases. The Holocene Climatic Optimum, in fact, is predicted by the Milankovitch cycles, since at that time the axial tilt of the earth was 24°, its steepest value, meaning the Northern Hemisphere got more solar radiation than normal -- but the Southern Hemisphere less, so the two balanced. By contrast, not only is the warming observed in the last 200 years much greater than during these previous episodes, but it is also global and bipolar, so it is not a purely local effect. The warming that ended the Little Ice Age (from the mid-1700s to the late 1800s) was due to increased solar radiation prior to 1940. Since 1940, however, the amount of solar radiation has been dropping, so the only candidate remaining for the post-1940 warming is carbon dioxide.[ 9] "It's just the sun, or cosmic rays, or volcanic activity or methane." Nope, sorry. The amount of heat that the sun provides has been decreasing since 1940,[ 10] just the opposite of the critics' claims (Fig. 3). There is no evidence of an increase in cosmic ray particles during the past century.[ 11] Nor is there any clear evidence that large-scale volcanic events (such as the 1815 eruption of Tambora in Indonesia, which changed global climate for about a year) have any long-term effects that would explain 200 years of warming and carbon dioxide increase. Volcanoes erupt only 0.3 billion tonnes of carbon dioxide each year, but humans emit over 29 billion tonnes a year,[ 12] roughly 100 times as much. Clearly, we have a bigger effect. Methane is a more powerful greenhouse gas, but there is 200 times more carbon dioxide than methane, so carbon dioxide is still the most important agent.[ 13] Every other alternative has been looked at and can be ruled out. The only clear-cut relationship is between human-caused carbon dioxide increase and global warming. \* "The climate records since 1995 (or 1998) show cooling." That's simply untrue. The only way to support this argument is to cherry-pick the data.[ 14] Over the short term, there was a slight cooling trend from 1998-2000, but only because 1998 was a record-breaking El Nino year, so the next few years look cooler by comparison (Fig. 4). But since 2002, the overall long-term trend of warming is unequivocal. All of the 16 hottest years ever recorded on a global scale have occurred in the last 20 years. They are (in order of hottest first): 2010, 2009, 1998, 2005, 2003, 2002, 2004, 2006, 2007, 2001, 1997, 2008, 1995, 1999, 1990, and 2000.[ 15] In other words, every year since 2000 has been on the Top Ten hottest years list. The rest of the top 16 include 1995, 1997, 1998, 1999, and 2000. Only 1996 failed to make the list (because of the short-term cooling mentioned already). \* "We had record snows in the winter of 2009-2010, and also in 2010-2011." So what? This is nothing more than the difference between weather (short-term seasonal changes) and climate (the long-term average of weather over decades and centuries and longer). Our local weather tells us nothing about another continent, or the global average; it is only a local effect, determined by short-term atmospheric and oceano-graphic conditions.[ 16] In fact, warmer global temperatures mean more moisture in the atmosphere, which increases the intensity of normal winter snowstorms. In this particular case, the climate change critics forget that the early winter of November-December 2009 was actually very mild and warm, and then only later in January and February did it get cold and snow heavily. That warm spell in early winter helped bring more moisture into the system, so that when cold weather occurred, the snows were worse. In addition, the snows were unusually heavy only in North America; the rest of the world had different weather, and the global climate was warmer than average. Also, the summer of 2010 was the hottest on record, breaking the previous record set in 2009. \* "Carbon dioxide is good for plants, so the world will be better off." Who do they think they're kidding? The Competitive Enterprise Institute (funded by oil and coal companies and conservative foundations[ 17]) has run a series of shockingly stupid ads concluding with the tag line "Carbon dioxide: they call it pollution, we call it life." Anyone who knows the basic science of earth's atmosphere can spot the gross inaccuracies in this ad.[ 18] True, plants take in carbon dioxide that animals exhale, as they have for millions of years. But the whole point of the global warming evidence (as shown from ice cores) is that the delicate natural balance of carbon dioxide has been thrown off balance by our production of too much of it, way in excess of what plants or the oceans can handle. As a consequence, the oceans are warming[ 19, 20] and absorbing excess carbon dioxide making them more acidic. Already we are seeing a shocking decline in coral reefs ("bleaching") and extinctions in many marine ecosystems that can't handle too much of a good thing. Meanwhile, humans are busy cutting down huge areas of temperate and tropical forests, which not only means there are fewer plants to absorb the gas, but the slash and burn practices are releasing more carbon dioxide than plants can keep up with. There is much debate as to whether increased carbon dioxide might help agriculture in some parts of the world, but that has to be measured against the fact that other traditional "breadbasket" regions (such as the American Great Plains) are expected to get too hot to be as productive as they are today. The latest research[ 21] actually shows that increased carbon dioxide inhibits the absorption of nitrogen into plants, so plants (at least those that we depend upon today) are not going to flourish in a greenhouse world. It is difficult to know if those who tell the public otherwise are ignorant of basic atmospheric science and global geochemistry, or if they are being cynically disingenuous. \* "I agree that climate is changing, but I'm skeptical that humans are the main cause, so we shouldn't do anything." This is just fence sitting. A lot of reasonable skeptics deplore the right wing's rejection of the reality of climate change, but still want to be skeptical about the cause. If they want proof, they can examine the huge array of data that points directly to human caused global warming.[ 22] We can directly measure the amount of carbon dioxide humans are producing, and it tracks exactly with the amount of increase in atmospheric carbon dioxide. Through carbon isotope analysis, we can show that this carbon dioxide in the atmosphere is coming directly from our burning of fossil fuels, not from natural sources. We can also measure the drop in oxygen as it combines with the increased carbon levels to produce carbon dioxide. We have satellites in space that are measuring the heat released from the planet and can actually see the atmosphere getting warmer. The most crucial evidence emerged only within the past few years: climate models of the greenhouse effect predict that there should be cooling in the stratosphere (the upper layer of the atmosphere above 10 km or 6 miles in elevation), but warming in the troposphere (the bottom layer below 10 km or 6 miles), and that's exactly what our space probes have measured. Finally, we can rule out any other suspects (see above): solar heat is decreasing since 1940, not increasing, and there are no measurable increases in cosmic rays, methane, volcanic gases, or any other potential cause. Face it -- it's our problem. Why Do People Continue to Question the Reality of Climate Change? Thanks to all the noise and confusion over climate change, the general public has only a vague idea of what the debate is really about, and only about half of Americans think global warming is real or that we are to blame.[ 23] As in the evolution/creationism debate, the scientific community is virtually unanimous on what the data demonstrate about anthropogenic global warming. This has been true for over a decade. When science historian Naomi Oreskes[ 24] surveyed all peer-reviewed papers on climate change published between 1993 and 2003 in the world's leading scientific journal, Science, she found that there were 980 supporting the idea of human-induced global warming and none opposing it. In 2009, Doran and Kendall Zimmerman[ 25] surveyed all the climate scientists who were familiar with the data. They found that 95-99% agreed that global warming is real and human caused. In 2010, the prestigious Proceedings of the National Academy of Sciences published a study that showed that 98% of the scientists who actually do research in climate change are in agreement over anthropogenic global warming.[ 26] Every major scientific organization in the world has endorsed the conclusion of anthropogenic climate change as well. This is a rare degree of agreement within such an independent and cantankerous group as the world's top scientists. This is the same degree of scientific consensus that scientists have achieved over most major ideas, including gravity, evolution, and relativity. These and only a few other topics in science can claim this degree of agreement among nearly all the world's leading scientists, especially among everyone who is close to the scientific data and knows the problem intimately. If it were not such a controversial topic politically, there would be almost no interest in debating it since the evidence is so clear-cut. If the climate science community speaks with one voice (as in the 2007 IPCC report, and every report since then), why is there still any debate at all? The answer has been revealed by a number of investigations by diligent reporters who got past the PR machinery denying global warming, and uncovered the money trail. Originally, there were no real "dissenters" to the idea of global warming by scientists who are actually involved with climate research. Instead, the forces with vested interests in denying global climate change (the energy companies, and the "free-market" advocates) followed the strategy of tobacco companies: create a smokescreen of confusion and prevent the American public from recognizing scientific consensus. As the famous memo[ 27] from the tobacco lobbyists said "Doubt is our product." The denialists generated an anti-science movement entirely out of thin air and PR. The evidence for this PR conspiracy has been well documented in numerous sources. For example, Oreskes and Conway revealed from memos leaked to the press that in April 1998 the right-wing Marshall Institute, SEPP (Fred Seitz's lobby that aids tobacco companies and polluters), and ExxonMobil, met in secret at the American Petroleum Institute's headquarters in Washington, D.C. There they planned a $20 million campaign to get "respected scientists" to cast doubt on climate change, get major PR efforts going, and lobby Congress that global warming isn't real and is not a threat. The right-wing institutes and the energy lobby beat the bushes to find scientists -- any scientists -- who might disagree with the scientific consensus. As investigative journalists and scientists have documented over and over again,[ 28] the denialist conspiracy essentially paid for the testimony of anyone who could be useful to them. The day that the 2007 IPCC report was released (Feb. 2, 2007), the British newspaper The Guardian reported that the conservative American Enterprise Institute (funded largely by oil companies and conservative think tanks) had offered $10,000 plus travel expenses to scientists who would write negatively about the IPCC report.[ 29] In February 2012, leaks of documents from the denialist Heartland Institute revealed that they were trying to influence science education, suppress the work of scientists, and had paid off many prominent climate deniers, such as Anthony Watts, all in an effort to circumvent the scientific consensus by doing an "end run" of PR and political pressure. Other leaks have shown 9 out of 10 major climate deniers are paid by ExxonMobil.[ 30] We are accustomed to hired-gun "experts" paid by lawyers to muddy up the evidence in the case they are fighting, but this is extraordinary -- buying scientists outright to act as shills for organizations trying to deny scientific reality. With this kind of money, however, you can always find a fringe scientist or crank or someone with no relevant credentials who will do what they're paid to do. Fishing around to find anyone with some science background who will agree with you and dispute a scientific consensus is a tactic employed by the creationists to sound "scientific". The NCSE created a satirical "Project Steve,"[ 31] which demonstrated that there were more scientists who accept evolution named "Steve" than the total number of "scientists who dispute evolution". It may generate lots of PR and a smokescreen to confuse the public, but it doesn't change the fact that scientists who actually do research in climate change are unanimous in their insistence that anthropogenic global warming is a real threat. Most scientists I know and respect work very hard for little pay, yet they still cannot be paid to endorse some scientific idea they know to be false. The climate deniers have a lot of other things in common with creationists and other anti-science movements. They too like to quote someone out of context ("quote mining"), finding a short phrase in the work of legitimate scientists that seems to support their position. But when you read the full quote in context, it is obvious that they have used the quote inappropriately. The original author meant something that does not support their goals. The "Climategate scandal" is a classic case of this. It started with a few stolen emails from the Climate Research Unit of the University of East Anglia. If you read the complete text of the actual emails[ 32] and comprehend the scientific shorthand of climate scientists who are talking casually to each other, it is clear that there was no great "conspiracy" or that they were faking data. All six subsequent investigations have cleared Philip Jones and the other scientists of the University of East Anglia of any wrongdoing or conspiracy.[ 33] Even if there had been some conspiracy on the part of these few scientists, there is no reason to believe that the entire climate science community is secretly working together to generate false information and mislead the public. If there's one thing that is clear about science, it's about competition and criticism, not conspiracy and collusion. Most labs are competing with each other, not conspiring together. If one lab publishes a result that is not clearly defensible, other labs will quickly correct it. As James Lawrence Powell wrote: Scientists…show no evidence of being more interested in politics or ideology than the average American. Does it make sense to believe that tens of thousands of scientists would be so deeply and secretly committed to bringing down capitalism and the American way of life that they would spend years beyond their undergraduate degrees working to receive master's and Ph.D. degrees, then go to work in a government laboratory or university, plying the deep oceans, forbidding deserts, icy poles, and torrid jungles, all for far less money than they could have made in industry, all the while biding their time like a Russian sleeper agent in an old spy novel? Scientists tend to be independent and resist authority. That is why you are apt to find them in the laboratory or in the field, as far as possible from the prying eyes of a supervisor. Anyone who believes he could organize thousands of scientists into a conspiracy has never attended a single faculty meeting.[ 34] There are many more traits that the climate deniers share with the creationists and Holocaust deniers and others who distort the truth. They pick on small disagreements between different labs as if scientists can't get their story straight, when in reality there is always a fair amount of give and take between competing labs as they try to get the answer right before the other lab can do so. The key point here is that when all these competing labs around the world have reached a consensus and get the same answer, there is no longer any reason to doubt their common conclusion. The anti-scientists of climate denialism will also point to small errors by individuals in an effort to argue that the entire enterprise cannot be trusted. It is true that scientists are human, and do make mistakes, but the great power of the scientific method is that peer review weeds these out, so that when scientists speak with consensus, there is no doubt that their data are checked carefully Finally, a powerful line of evidence that this is a purely political controversy, rather than a scientific debate, is that the membership lists of the creationists and the climate deniers are highly overlapping. Both anti-scientific dogmas are fed to their overlapping audiences through right-wing media such as Fox News, Glenn Beck, and Rush Limbaugh. Just take a look at the "intelligent-design" cre-ationism website for the Discovery Institute. Most of the daily news items lately have nothing to do with creationism at all, but are focused on climate denial and other right-wing causes.[ 35] If the data about global climate change are indeed valid and robust, any qualified scientist should be able to look at them and see if the prevailing scientific interpretation holds up. Indeed, such a test took place. Starting in 2010, a group led by U.C. Berkeley physicist Richard Muller re-examined all the temperature data from the NOAA, East Anglia Hadley Climate Research Unit, and the Goddard Institute of Space Science sources. Even though Muller started out as a skeptic of the temperature data, and was funded by the Koch brothers and other oil company sources, he carefully checked and re-checked the research himself. When the GOP leaders called him to testify before the House Science and Technology Committee in spring 2011, they were expecting him to discredit the temperature data. Instead, Muller shocked his GOP sponsors by demonstrating his scientific integrity and telling the truth: the temperature increase is real, and the scientists who have demonstrated that the climate is changing are right (Fig. 5). In the fall of 2011, his study was published, and the conclusions were clear: global warming is real, even to a right-wing skeptical scientist. Unlike the hired-gun scientists who play political games, Muller did what a true scientist should do: if the data go against your biases and preconceptions, then do the right thing and admit it -- even if you've been paid by sponsors who want to discredit global warming. Muller is a shining example of a scientist whose integrity and honesty came first, and did not sell out to the highest bidder.[ 36] \* Science and Anti-Science The conclusion is clear: there's science, and then there's the anti-science of global warming denial. As we have seen, there is a nearly unanimous consensus among climate scientists that anthropogenic global warming is real and that we must do something about it. Yet the smokescreen, bluster and lies of the deniers has created enough doubt so that only half of the American public is convinced the problem requires action. Ironically, the U.S. is almost alone in questioning its scientific reality. International polls taken of 33,000 people in 33 nations in 2006 and 2007 show that 90% of their citizens regard climate change as a serious problem[ 37] and 80% realize that humans are the cause of it.[ 38] Just as in the case of creationism, the U.S. is out of step with much of the rest of the world in accepting scientific reality. It is not just the liberals and environmentalists who are taking climate change seriously. Historically conservative institutions (big corporations such as General Electric and many others such as insurance companies and the military) are already planning on how to deal with global warming. Many of my friends high in the oil companies tell me of the efforts by those companies to get into other forms of energy, because they know that cheap oil will be running out soon and that the effects of burning oil will make their business less popular. BP officially stands for "British Petroleum," but in one of their ad campaigns about 5 years ago, it stood for "Beyond Petroleum."[ 39] Although they still spend relatively little of their total budgets on alternative forms of energy, the oil companies still see the handwriting on the wall about the eventual exhaustion of oil -- and they are acting like any company that wants to survive by getting into a new business when the old one is dying. The Pentagon (normally not a left-wing institution) is also making contingency plans for how to fight wars in an era of global climate change, and analyzing what kinds of strategic threats might occur when climate change alters the kinds of enemies we might be fighting, and water becomes a scarce commodity. The New York Times reported[ 40] that in December 2008, the National Defense University outlined plans for military strategy in a greenhouse world. To the Pentagon, the big issue is global chaos and the potential of even nuclear conflict. The world must "prepare for the inevitable effects of abrupt climate change -- which will likely come [the only question is when] regardless of human activity." Insurance companies have no political axe to grind. If anything, they tend to be on the conservative side. They are simply in the business of assessing risk in a realistic fashion so they can accurately gauge their future insurance policies and what to charge for them. Yet they are all investing heavily in research on the disasters and risks posed by climatic change. In 2005, a study commissioned by the re-insurer Swiss Re said, "Climate change will significantly affect the health of humans and ecosystems and these impacts will have economic consequences."[ 41] Some people may still try to deny scientific reality, but big businesses like oil and insurance and conservative institutions like the military cannot afford to be blinded or deluded by ideology. They must plan for the real world that we will be seeing in the next few decades. They do not want to be caught unprepared and harmed by global climatic change when it threatens their survival. Neither can we as a society.

**SMRs are the only solution that adresses the magnitude of warming before its too late.**

**Palley 11 (**Reese Palley, The London School of Economics, 2011, The Answer: Why Only Inherently Safe, Mini Nuclear Power Plans Can Save Our World, p. 186-90)

The central investigation of this book has been directed at the scale of the nuclear industry. The book has argued that all anthropogenic challenges that put in question **continued human existence** on Earth are a **matter of scale**. It was nature’s unanticipated success with her human experiment, the evolutionary choice of brains over brawn, setting in motion the underlying scale problems that opened our Pandora’s box of calamities. The history of man on Earth can best be viewed as a race between population and resources in which, for some millennia, population expansion leads and the Earth’s resources have been straining to catch up. When population bloomed from 100 million brainy humans to a billion, the problems of scale emerged as the price we had to pay for success as a species. The conversion of forests to agriculture, responding to the need to feed a burgeoning population, initiated the emerging problem of scale. The elimination of oxygen-emitting forests was mitigated to a large measure in the beginning of our population growth by the slow rate of change of the deforestation, which allowed an absorbable increase of CO2 in the atmosphere. Natural processes, such as the ability of the oceans to take up CO2, tamped down global warming. But as the scale of the release of warming gases exploded a few hundred years ago, our remaining forests and our seas, our first line of defense against CO2 imbalance, could not cope and the level of CO2 has risen alarmingly each year since 1800. When human population climbed from a billion to six billion and these six billion reveled in the enormous energy content of coal, the scenario for **disaster on a global scale** came into play. The impact of the loss of forest paled in comparison to the havoc that the use of fossil fuels represented. In a world that was hungry for energy and, not incidentally, living on a Malthusian edge of food supply, coal burst upon us as manna from heaven. Coal was everywhere, easy to mine, and in enormous, almost unending supply It generated the cheap heat needed to run the engines of early industrialization. An unintended Faustian bargain was struck. The immediate cost of coal in the cities, dirt and pollution, were not out of sync with what urban man had lived with for centuries. It was beyond the science and the understanding of the time that burning vast millennial coal deposits would do little more than discommode the proximate few and benefit many. Again it was not the burning, it was **the scale** of the burning that dumped billions of tons of CO2 into the atmosphere. We are now presented with a horrendous invoice that must be paid if we are to **survive** in anywhere near the comfort to which we have become accustomed. It has been the intent of this book to argue that the **scale of the warming catastrophe** must be viewed primarily in terms of the continuing flow of CO2 into the atmosphere. Every possible source of CO2, no matter how small, must be identified and interdicted, since every fourth molecule of the gas will remain with us as a climate moderator for thousands of years. What we find is that all of the sources of energy including so-called green energy are CO2-culpable and that each, in spite of claims to the contrary, adds its tiny mite or enormous mass to the climate changes looming in man’s future. The book argues that the scale of the consumption of fossil fuels is clearly unsustainable and, more to the point, that the feeble attempts to restrict CO2 production are little more than a glossing over of the problem. Capping but not ending production of greenhouse gases only magnifies the unthinkable future costs of bringing the level of CO2 and other greenhouse gases back into balance. Logic dictates that merely limiting greenhouse gases pushes possible solutions farther and farther into the future and does little to mitigate the difficulties that will arise in the near future. Logic dictates that our reasonably comfortable survival depends on the immediate and total cessation of increases to parts per million of CO2 in the air. Logic dictates that if we are to continue to enjoy the level of comfort, wealth, and ease afforded us since the beginning of the twentieth century we must not only halt the increase but commence the actual decrease of warming gases at work in the atmosphere. That conclusion brings the book to the problems and the solutions inherent in nuclear power, the **only energy source** that can guarantee us a reasonable future that might be resistant to CO2 warming. Here the argument returns once again to the problem of scale of nuclear reactors, especially as the size of these reactors is related to the brief time left to us to get a grip on calamitous climate changes. The beginnings of nuclear energy lay in the demands of war. The battle between good and evil characterized by the Second World War gave hurried birth to a discovery that had the inherent power to both destroy and salvage. The power to destroy required plutonium on an enormous scale, which was projected forward into the postwar development of civilian reactors. The demand for scarce plutonium for the bombs of the cold war defined the type of reactors that were being developed. These were the breeder reactors, which spewed out plutonium measured in tons that had previously been available only in ounces, and would continue to do so when the wartime need was far behind us. What was once precious, rare, and desirable has become dangerous nuclear waste, and the imperfectly perceived scale of the waste problem has seriously inhibited the logical growth and development of nuclear power. By some unthinkable universal coincidence, nuclear power became available to man for war at the same time that it could prove to be the solution to man’s greatest peacetime challenge. But the gigawatt nuclear power plants that emerged from the war had within them the seeds of their own severe limitation. The scale of the risks, real and imagined, grew exponentially as the scale of energy output grew only linearly. These risks, some merely perceived, some dangerously real and some financial, have conspired to restrict the enormous expansion of nuclear power that is needed to quickly replace our present consumption of energy from fossil fuels. The present rate of replacement of fossil with nuclear sources is at a pace that will have little impact on ultimately dealing with the CO2 imbalance. This slow rate of change is compounded of public fears, bureaucratic regulatory mechanisms resistant to novel solutions, and a private capital market that is unable to conjure with the imagined and real risks of the huge gigawatt reactors that dominate the industry. It is a Gordian knot that cannot be unraveled but which can only be cut by a political sword that, alas, still lacks the edge to do the job. By another rare act of cosmic fortuity, there is a parallel existing nuclear technology that, barring political interference, is capable of addressing the scale problems inherent in gigawatt reactors. From the beginning of the nuclear era, researchers such as Weinberg and Wigner and Teller developed small, inherently safe nuclear reactors that did not breed plutonium. This was reason enough for the military, balancing urgent demands on research and development budgets, to consign the concept of “smaller and safer is better” to dusty shelves in our national science attic. This book has argued that small reactors, that produce a tenth of the energy of the giants also generate inordinately less of the risk that inhibits growth of the industry. Construction of small reactors is a fraction of the cost of construction of gigawatt reactors. Thus the number of years that scarce capital is tied up and at risk is substantially reduced. The book argues that a 100 MWe reactor88 is a much bigger hardware bargain than a gigawatt reactor, which, from start to output, can cost $15 billion. It is not only the hardware costs that contribute to the devilish details of risk. The problem is the inability of the market to accurately or even approximately estimate the real cost of the capital that would be tied up for over a decade in a project that, through technological advancements, could be obsolete before it ever joins the grid.

**All alternatives to SMRs are insufficiency in scope --- plus safety concerns are all hype.**

**Nordhaus 12** (Michael Shellenberger, Jessica Lovering, Founder of the Breakthrough Institute, graduate of Earlham College and holds a masters degree in cultural anthropology from the University of California, Santa Cruz, "New Nukes: Why We Need Radical Innovation to Make New Nuclear Energy Cheap", September 11, http://thebreakthrough.org/index.php/programs/energy-and-climate/new-nukes/)

Arguably, the biggest impact of Fukushima on the nuclear debate, ironically, has been to force a growing number of pro-nuclear environmentalists out of the closet, including us. The reaction to the accident by anti-nuclear campaigners and many Western publics put a fine point on the gross misperception of risk that informs so much anti-nuclear fear. Nuclear remains the only proven technology capable of reliably generating zero-carbon energy at a scale that can have any impact on global warming. Climate change -- and, for that matter, the enormous present-day health risks associated with burning coal, oil, and gas -- simply dwarf any legitimate risk associated with the operation of nuclear power plants. About 100,000 people die every year due to exposure to air pollutants from the burning of coal. By contrast, about 4,000 people have died from nuclear energy -- ever -- almost entirely due to Chernobyl. But rather than simply lecturing our fellow environmentalists about their misplaced priorities, and how profoundly inadequate present-day renewables are as substitutes for fossil energy, we would do better to take seriously the real obstacles standing in the way of a serious nuclear renaissance. Many of these obstacles have nothing to do with the fear-mongering of the anti-nuclear movement or, for that matter, the regulatory hurdles imposed by the U.S. Nuclear Regulatory Commission and similar agencies around the world. As long as nuclear technology is characterized by enormous upfront capital costs, it is likely to remain just a hedge against overdependence on lower-cost coal and gas, not the wholesale replacement it needs to be to make a serious dent in climate change. Developing countries need large plants capable of bringing large amounts of new power to their fast-growing economies. But they also need power to be cheap. So long as coal remains the cheapest source of electricity in the developing world, it is likely to remain king. The most worrying threat to the future of nuclear isn't the political fallout from Fukushima -- it's economic reality. Even as new nuclear plants are built in the developing world, old plants are being retired in the developed world. For example, Germany's plan to phase-out nuclear simply relies on allowing existing plants to be shut down when they reach the ends of their lifetime. Given the size and cost of new conventional plants today, those plants are unlikely to be replaced with new ones. As such, the combined political and economic constraints associated with current nuclear energy technologies mean that nuclear energy's share of global energy generation is unlikely to grow in the coming decades, as global energy demand is likely to increase faster than new plants can be deployed. To move the needle on nuclear energy to the point that it might actually be capable of displacing fossil fuels, we'll need new nuclear technologies that are cheaper and smaller. Today, there are a range of nascent, smaller nuclear power plant designs, some of them modifications of the current light-water reactor technologies used on submarines, and others, like thorium fuel and fast breeder reactors, which are based on entirely different nuclear fission technologies. Smaller, modular reactors can be built much faster and cheaper than traditional large-scale nuclear power plants. Next-generation nuclear reactors are designed to be incapable of melting down, produce drastically less radioactive waste, make it very difficult or impossible to produce weapons grade material, use less water, and require less maintenance. Most of these designs still face substantial technical hurdles before they will be ready for commercial demonstration. That means a great deal of research and innovation will be necessary to make these next generation plants viable and capable of displacing coal and gas. The United States could be a leader on developing these technologies, but unfortunately U.S. nuclear policy remains mostly stuck in the past. Rather than creating new solutions, efforts to restart the U.S. nuclear industry have mostly focused on encouraging utilities to build the next generation of large, light-water reactors with loan guarantees and various other subsidies and regulatory fixes. With a few exceptions, this is largely true elsewhere around the world as well. Nuclear has enjoyed bipartisan support in Congress for more than 60 years, but the enthusiasm is running out. The Obama administration deserves credit for authorizing funding for two small modular reactors, which will be built at the Savannah River site in South Carolina. But a much more sweeping reform of U.S. nuclear energy policy is required. At present, the Nuclear Regulatory Commission has little institutional knowledge of anything other than light-water reactors and virtually no capability to review or regulate alternative designs. This affects nuclear innovation in other countries as well, since the NRC remains, despite its many critics, the global gold standard for thorough regulation of nuclear energy. Most other countries follow the NRC's lead when it comes to establishing new technical and operational standards for the design, construction, and operation of nuclear plants. What's needed now is a new national commitment to the development, testing, demonstration, and early stage commercialization of a broad range of new nuclear technologies -- from much smaller light-water reactors to next generation ones -- in search of a few designs that can be mass produced and deployed at a significantly lower cost than current designs. This will require both greater public support for nuclear innovation and an entirely different regulatory framework to review and approve new commercial designs. In the meantime, developing countries will continue to build traditional, large nuclear power plants. But time is of the essence. With the lion's share of future carbon emissions coming from those emerging economic powerhouses, the need to develop smaller and cheaper designs that can scale faster is all the more important. A true nuclear renaissance can't happen overnight. And it won't happen so long as large and expensive light-water reactors remain our only option. But in the end, **there is no credible path to mitigating climate change without a massive global expansion of nuclear energy**. If you care about climate change, nothing is more important than developing the nuclear technologies we will need to get that job done.

**The impact of warming is greater than all others. No humans will survive.**

**Brandenberg 99** (John & Monica Paxson, Visiting Prof. Researcher @ Florida Space Institute, Physicist Ph.D., Science Writer, Dead Mars Dying Earth, Pg 232-233)

The ozone hole expands, driven by a monstrous synergy with global warming that puts more catalytic ice crystals into the stratosphere, but this affects the far north and south and not the major nations’ heartlands. The seas rise, the tropics roast but the media networks no longer cover it. The Amazon rainforest becomes the Amazon desert. Oxygen levels fall, but profits rise for those who can provide it in bottles. An equatorial high-pressure zone forms, forcing drought in central Africa and Brazil, the Nile dries up and the monsoons fail. Then inevitably, at some unlucky point in time, a major unexpected event occurs—a major volcanic eruption, a sudden and dramatic shift in ocean circulation or a large asteroid impact (those who think freakish accidents do not occur have paid little attention to life or Mars), or a nuclear war that starts between Pakistan and India and escalates to involve China and Russia . . . Suddenly the gradual climb in global temperatures goes on a mad excursion as the oceans warm and release large amounts of dissolved carbon dioxide from their lower depths into the atmosphere. Oxygen levels go down precipitously as oxygen replaces lost oceanic carbon dioxide. Asthma cases double and then double again. Now a third of the world fears breathing. As the oceans dump carbon dioxide, the greenhouse effect increases, which further warms the oceans, causing them to dump even more carbon. Because of the heat, plants die and burn in enormous fires, which release more carbon dioxide, and the oceans evaporate, adding more water vapor to the greenhouse. Soon, we are in what is termed a runaway greenhouse effect, as happened to Venus eons ago. The last two surviving scientists inevitably argue, one telling the other, “See! I told you the missing sink was in the ocean!” Earth, as we know it, dies. After this Venusian excursion in temperatures, the oxygen disappears into the soil, the oceans evaporate and are lost and the dead Earth loses its ozone layer completely. Earth is too far from the Sun for it to be the second Venus for long. Its atmosphere is slowly lost—as is its water—because of ultraviolet bombardment breaking up all the molecules apart from carbon dioxide. As the atmosphere becomes thin, the Earth becomes colder. For a short while temperatures are nearly normal, but the ultraviolet sears any life that tries to make a comeback. The carbon dioxide thins out to form a thin veneer with a few wispy clouds and dust devils. Earth becomes the second Mars—red, desolate, with perhaps a few hardy microbes surviving.

**Every increase must be resisted**.

**Pittock 10** (Barrie, Led the Climate Impact Group in CSIRO until his retirement in 1999. He contributed to or was the lead author of all four major reports of the Intergovernmental Panel on Climate Change. He was awarded a Public Service Medal in 1999 and is CSIRO Honorary Fellow, *Climate Change: The Science, Impacts, and Solutions*, 2010, pg. 326)

It isabsolutelycrucial that options for reducing greenhouse gas emissions be pursued with a real sense of urgency. **Every extra tonne** of carbon dioxide placed into the atmosphere increases the very real risk of dangerous climate change**,** and nobody will escape the direct or indirect consequences.We are in danger of **inadvertently** tripping the 'on' switch to disaster, with an inevitably long delay before it can be turned off again. What is done now that enhances climate change cannot be easily undone, so we should **err on the side of caution***.* Butit is not all doom and gloom:we can save theday. As we have seen earlier in this book, the technology already exists to rapidly reduce emissions via large investments in energy efficiency (which saves money) and renewable base-load power (which will rapidly come down in price as it is scaled up). Supplemented later this century by large-scale carbon capture and sequestration and (if necessary) by safe nuclear power, the peak in greenhouse gas concentrations can be minimised and then brought down.We need to reduce carbon emissions**,** and we **need to do it fast.** Although we are facing an emergency**,** with an appropriate allocation of ingenuity and resources**,** together we can do it.We owe that, at least, to our children**.**

**The plan results in global SMR exports – massively reduces emissions.**

**Rosner 11** (Robert – Past Director of the Argonne National Laboratory, The William E. Wrather Distinguished Service Professor @ the Departments of Astronomy and Astrophysics and Physics, Enrico Fermi Institute, and the College, Senior Fellow @ the Computation Institute (CI), Stephen Goldberg – Special assistant to the director at Argonne National Laboratory, *Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.*, Energy Policy Institute at Chicago The Harris School of Public Policy Studies, Technical Paper, November 2011)

As stated earlier, SMRs have the potential to achieve significant greenhouse gas emission reductions. They could provide alternative baseload power generation to facilitate the retirement of older, smaller, and less efficient coal generation plants that would, otherwise, not be good candidates for retrofitting carbon capture and storage technology. They could be deployed in regions of the U.S. and the world that have less potential for other forms of carbon-free electricity, such as solar or wind energy. There may be technical or market constraints, such as projected electricity demand growth and transmission capacity, which would support SMR deployment but not GW-scale LWRs. From the on-shore manufacturing perspective, a key point is that the manufacturing base needed for SMRs can be developed domestically. Thus, while the large commercial LWR industry is seeking to transplant portions of its supply chain from current foreign sources to the U.S., the SMR industry offers the potential to establish a large domestic manufacturing base building upon already existing U.S. manufacturing infrastructure and capability, including the Naval shipbuilding and underutilized domestic nuclear component and equipment plants. The study team learned that a number of sustainable domestic jobs could be created – that is, the full panoply of design, manufacturing, supplier, and construction activities – if the U.S. can establish itself as a credible and substantial designer and manufacturer of SMRs. While many SMR technologies are being studied around the world, a strong U.S. commercialization program can enable U.S. industry to be first to market SMRs, thereby serving as a fulcrum for export growth as well as a lever in influencing international decisions on deploying both nuclear reactor and nuclear fuel cycle technology. A viable U.S.-centric SMR industry would enable the U.S. to recapture technological leadership in commercial nuclear technology, which has been lost to suppliers in France, Japan, Korea, Russia, and, now rapidly emerging, China.

### 1AC—Plan

**Plan --- The United States federal government should acquire electricity from small modular reactors for mission critical military installations in the United States and exempt the Department of Defense from relevant small modular reactor licensing restrictions.**

### 1AC—Solvency

**Contention Three – Solvency**

**Military action is necessary---it shapes technology development and overcomes market failures---that's key to commercialization.**

**Andres 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. Breetz – 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*, Strategic Forum, National Defense University, Institute for National Strategic Studies, February 2011, http://www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf)

DoD as first Mover Thus far, this paper has reviewed two of DOD’s most pressing energy vulnerabilities—grid insecurity and fuel convoys—and explored how they could be addressed by small reactors. We acknowledge that there are many un- certainties and risks associated with these reactors. On the other hand, failing to pursue these technologies raises its own set of risks for DOD, which we review in this section: first, small reactors may fail to be commercialized in the United States; second, the designs that get locked in by the private market may not be optimal for DOD’s needs; and third, expertise on small reactors may become concentrated in foreign countries. By taking an early “first mover” role in the small reactor market, DOD could mitigate these risks and secure the long-term availability and appropriateness of these technologies for U.S. military applications. The “Valley of Death.” Given the promise that small reactors hold for military installations and mo- bility, DOD has a compelling interest in ensuring that they make the leap from paper to production. How- ever, if DOD does not provide an initial demonstration and market, there is a chance that the U.S. small reactor industry may never get off the ground. The leap from the laboratory to the marketplace is so difficult to bridge that it is widely referred to as the “Valley of Death.” Many promising technologies are never commercialized due to a **variety of market failures**— including technical and financial uncertainties, information asymmetries, capital market imperfections, transaction costs, and environmental and security externalities—that impede financing and early adoption and can lock innovative technologies **out of the marketplace**.28 In such cases, the Government can help a worthy technology to bridge the Valley of Death by accepting the first mover costs and demonstrating the technology’s scientific and economic viability.29 Historically, nuclear power has been “the **most clear-cut example** . . . of an important general-purpose technology that in the absence of military and defense-related procurement would not have been developed at all.”30 Government involvement is likely to be **crucial** for innovative, next-generation nuclear technology as well. Despite the widespread revival of interest in nu- clear energy, Daniel Ingersoll has argued that radically innovative designs face an uphill battle, as “the high capital cost of nuclear plants and the painful lessons learned during the first nuclear era have created a prevailing fear of first-of-a-kind designs.”31 In addition, **M**assachusetts **I**nstitute of **T**echnology reports on the Future of Nuclear Power called for the Government to provide modest “first mover” assistance to the private sector due to several barriers that have hindered the nu- clear renaissance, such as securing high up-front costs of site-banking, gaining NRC certification for new technologies, and demonstrating technical viability.32 It is possible, of course, that small reactors will achieve commercialization without DOD assistance. As discussed above, they have garnered increasing attention in the energy community. Several analysts have even ar- gued that small reactors could play a key role in the sec- ond nuclear era, given that they may be the only reactors within the means of many U.S. utilities and developing countries.33 However, given the tremendous regulatory hurdles and technical and financial uncertainties, it appears far from certain that the U.S. small reactor industry will take off. If DOD wants to ensure that small reactors are available in the future, then it should **pursue a leadership** role now. Technological Lock-in. A second risk is that if small reactors do reach the market without DOD assistance, the designs that succeed may not be optimal for DOD’s applications. Due to a variety of positive feedback and increasing returns to adoption (including dem- onstration effects, technological interdependence, net- work and learning effects, and economies of scale), the designs that are initially developed can become “locked in.”34 Competing designs—even if they are superior in some respects or better for certain market segments— can face barriers to entry that lock them out of the mar- ket. If DOD wants to ensure that its preferred designs are **not locked out**, then it should take a first mover role on small reactors. It is far too early to gauge whether the private market and DOD have aligned interests in reactor de- signs. On one hand, Matthew Bunn and Martin Ma- lin argue that what the world needs is cheaper, safer, more secure, and more proliferation-resistant nuclear reactors; presumably, many of the same broad qualities would be favored by DOD.35 There are many varied market niches that could be filled by small reactors, because there are many different applications and set- tings in which they can be used, and it is quite pos- sible that some of those niches will be compatible with DOD’s interests.36 On the other hand, DOD may have specific needs (transportability, for instance) that would not be a high priority for any other market segment. Moreover, while DOD has unique technical and **organizational capabilities** that could enable it to pursue more radically innovative reactor lines, DOE has indicated that it will focus its initial small reactor deployment efforts on LWR designs.37 If DOD wants to ensure that its preferred reactors are developed and available in the future, it should take a leadership role now. Taking a first mover role does not necessarily mean that DOD would be “**picking a winner**” among small reactors, as the market will probably pursue multiple types of small reactors. Nevertheless, DOD leadership would likely have a profound effect on the industry’s timeline and trajectory.

**Absent military involvement smaller reactors will not come to market.**

**Cohen 12** (Armond, Executive Director – Clean Air Task Force, *DoD: A Model for Energy Innovation?*, http://energy.nationaljournal.com/2012/05/powering-our-military-whats-th.php#2211477)

Recently, the Clean Air Task Force and our colleagues at The Consortium for Science, Policy and Outcomes at Arizona State University, assessed the opportunities and challenges at the U.S. Department of Defense for accelerating a national and even global transition to advanced and clean energy technologies.

Building on background papers, a workshop, new research, and a previous project that articulated foundational principles for federal energy innovation policies, this report identified the sources of DoD’s success in fostering new technology that can be applied to both civilian energy innovation efforts and future defense-related energy efforts.

Unlike most other agencies, including the Energy Department, the Pentagon is the ultimate customer for the new technology it helps create, spending some $200 billion each year on R&D and procurement. The implications of DoD’s role as customer have not been widely appreciated, as:

· DoD, uniquely in government, supports multi-year, billion-dollar “end to end” innovation efforts that produce technology that is continuously tested, deployed and refined on bases and in the field, providing **real world feedback** that leads to **increases in performance** and **reductions in cost**. By contrast, most of the federal government’s civilian energy innovation efforts involve research loosely connected at best with the few commercialization efforts that it supports.

· DoD and its contractors know how to **bring together multiple innovations** to achieve **system-level advances** leading to **big performance gains** (examples range from nuclear submarines to unmanned aircraft to large-scale information systems). This systems approach is precisely what is needed to advance clean energy technologies.

· Relatively stable, multi-year funding allows the Pentagon to pursue “long cycle” innovation that is necessary for large, capital- intensive technologies and supports a highly capable contractor base that can respond to changing national security demands.

· The Pentagon’s scope and budget has allowed it to **experiment** with new and **creative innovation tools** such as the well-known Defense Advanced Projects Research Agency, which has produced extraordinary technological breakthroughs; and the Environmental Security Technology Certification Program, which develops and demonstrates cost-effective improvements in environmental and energy technologies for military installations and equipment.

· Because of DoD’s size and demands for performance and reliability, it is unique among government and private sector organizations as a **demonstration test-bed**. Smart-grid technologies and advanced energy management systems for buildings are already poised to benefit from this aspect of the Pentagon’s innovation system.

· DoD has collaborated effectively with other federal agencies, including the Department of Energy and its predecessors (for example, to advance nuclear energy technologies). Continuing competition and cooperation between DoD and DOE will spur energy innovation.

DoD’s innovation capabilities can enhance U.S. national security, improve U.S. international competitiveness, and spur global energy restructuring and greenhouse gas emissions reductions.

At the same time, while providing enormous opportunities to develop and test energy efficiency technologies and small scale distributed energy appropriate to forward bases, the Pentagon is unlikely to become an all-purpose hub for advancing all categories of clean-energy technologies, because its energy innovation activities will be sustainable only where they can support the nation’s defense capabilities.

Therefore, many other large-scale technologies that are of great importance to improving the environment, such as carbon-free central station generation or zero carbon transportation, may not as easily fit with DoD’s mission. Possible exceptions might include small modular nuclear reactors that can be used for producing independent, non-grid power at military bases, or, conceivably, zero-carbon liquid fuels other than anything resembling current generation biofuels.

In any case, the challenge for military-led energy innovation is to further define and delineate avenues for improved clean-energy performance that are linked to the national strategic mission. History shows that when such linkages are strong, DoD’s innovation capabilities are **second to none**.

But perhaps the more important lesson from this work is that a serious American program of civilian energy innovation could profitably look to Pentagon history for clues about how to succeed. Stable and significant funding; “end to end” thinking on long innovation cycles; procurement of advanced energy technology at commercial scale as well as research and testing; and institutional experimentation and diversity using multiple institutional channels – these have been important reasons that the United States has the most lethal and effective military arsenal in world history. If we’re serious about maintaining American superiority in the energy technology domain, some of this “defense innovation DNA” needs to be replicated or adapted to meet the challenge.

**Regulatory reform is necessary---it sends a signal to investor that overcomes current barriers.**

**Loris 11** (Nicolas D. Loris – Research Associate in the Roe Institute, Jack Spencer – Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies, Currently is The Heritage Foundation’s senior research fellow in nuclear energy policy, Previously worked on commercial, civilian and military components of nuclear energy at the Babcock & Wilcox Companies, Holds a bachelor's degree in international politics from Frostburg State University and a master's degree from the University of Limerick, *A Big Future for Small Nuclear Reactors?*, February 2nd, http://www.heritage.org/research/reports/2011/02/a-big-future-for-small-nuclear-reactors)

Abstract: More and more companies—in the U.S. and abroad—are investing in new commercial nuclear enterprises, chief among them, small modular reactors (SMRs). The SMR industry is growing, with many promising developments in the works—which is precisely why the government should not interfere, as subsidies and government programs have already resulted in an inefficient system for large reactors. Heritage Foundation nuclear policy experts explain how the future for small reactors can remain bright. Small modular reactors (SMRs) have garnered significant attention in recent years, with companies of all sizes investing in these smaller, safer, and **more cost-efficient** nuclear reactors. Utilities are even forming partnerships with reactor designers to prepare for potential future construction. Perhaps most impressive is that most of this development is occurring without government involvement. Private investors and entrepreneurs are **dedicating resources** to these technologies based on their future prospects, not on government set-asides, mandates, or subsidies, and despite the current regulatory bias in favor of large light water reactors (LWRs). The result is a young, robust, innovative, and growing SMR industry. Multiple technologies are being proposed that each have their own set of characteristics based on price, fuel, waste characteristics, size, and any number of other variables. To continue this growth, policymakers should reject the temptation to offer the same sort of subsidies and government programs that have proven ineffective for large LWRs. While Department of Energy cost-sharing programs and capital subsidies seem attractive, they have yet to net any new reactor construction. Instead, policymakers should focus on the systemic issues that have continued to thwart the expansion of nuclear power in recent years. Specifically, the federal government needs to develop an efficient and **predictable regulatory pathway** to new reactor certification and to develop a sustainable nuclear waste management strategy. Why SMRs? Small modular reactors share many of the attractive qualities of large reactors, such as providing abundant emissions-free power, while adding new features that could make them more appropriate for certain applications, such as providing power to rural communities or for dedicated industrial use. SMRs are not yet positioned to take the place of traditional large LWRs, but they represent an important growth area for the commercial nuclear industry. Indeed, should the promise of small modular reactors be realized, the technology could transform the nuclear industry. That is because these attributes would potentially mitigate some of the financial and regulatory problems that nuclear energy has recently faced. SMRs potentially cost less (at least in up-front capital), are more mobile and multifunctional, provide competition, and can largely be produced by existing domestic infrastructure. Lower Costs Up Front. Large reactors are very expensive to license and construct and require massive up-front capital investments to begin a project. Small reactors, while providing far less power than large reactors, can be built in modules and thus be paid for over time. For example, estimates for larger reactors range from $6 billion to $10 billion and must be financed all at once. The Babcock & Wilcox Company’s modular mPower reactors, alternatively, can be purchased in increments of 125 megawatts (MW), which would allow costs to be spread out over time. Though cost estimates are not yet available for the mPower reactor, its designers have stated that they will be competitive. This should not be used as a reason to refrain from building larger, 1,000-plus MW reactors. Each utility will have its own set of variables that it must consider in choosing a reactor technology, but given that one of the primary justifications for government subsidies is that the high costs of large reactors puts unacceptable strain on utility balance sheets, an option that spreads capital outlays over time should be attractive. Safe Installation in Diverse Locations. Some designs are small enough to produce power for as few as 20,000 homes. One such reactor, Hyperion Power’s HPM (Hyperion Power Module) offers 25 MW of electricity for an advertised cost of $50 million per unit. This makes the HPM a potential power solution for isolated communities or small cities.[1] The Alaskan town of Galena, for example, is planning to power its community with a small reactor designed by Toshiba, while Fairbanks is looking into a small plant constructed by Hyperion.[2] In addition, Western Troy Capital Resources has stated that it will form a private corporation to provide electric power from small reactors for remote locations in Canada.[3] Public utility officials in Grays Harbor, Washington, have spoken with the NuScale Power company about powering the community with eight small nuclear plants;[4] and Hyperion Power has reported a high level of interest in small nuclear reactor designs from islands around the world.[5] Using a small nuclear reactor could cut electricity costs in isolated areas since there would be no need for expensive transmission lines to carry power to remote locations.[6] SMRs could also potentially be integrated into existing energy infrastructure. SMRs could be built into old coal plants, for instance. The reactors would replace the coal boilers and be hooked into the existing turbines and distribution lines. According to the Nuclear Regulatory Commission, these modifications could be completed safely since small reactors will likely be easier to control during times of malfunction.[7] Multi-functionality. SMRs can be used in a variety of applications that have substantial power and heat requirements. The chemical and plastics industries and oil refineries all use massive amounts of natural gas to fuel their operations. Similarly, small reactors could produce the heat needed to extract oil from tar sands, which currently requires large amounts of natural gas. While affordable today, natural gas prices vary significantly over time, so the long-term predictable pricing that nuclear provides could be very attractive. SMRs may also provide a practical solution for desalination plants (which require large amounts of electricity) that can bring fresh water to parts of the world where such supplies are depleting.[8] Perhaps most important, is that SMRs have the potential to bring power and electricity to the 1.6 billion people in the world today that have no access to electricity, and to the 2.4 billion that rely on biomass, such as wood, agricultural residue, and dung for cooking and heating.[9] Competition. While competition among large nuclear-reactor technologies currently exists, small reactors will add a new dimension to nuclear-reactor competition. Multiple small technology designs are set to emerge on the market. Not only will competition among small reactors create a robust market, it will also provide an additional incentive for large reactors to improve. If smaller reactors begin to capture a share of the nuclear market and the energy market at large, it will drive innovation and ultimately lower prices for both new and existing technologies. Domestic Production. Although the nuclear industry necessarily shrank to coincide with decreased demand, much of the domestic infrastructure remains in place today and could support the expansion of small-reactor technologies. Although the industrial and intellectual base has declined over the past three decades, forging production, heavy manufacturing, specialized piping, mining, fuel services, and skilled labor could all be found in the United States. Lehigh Heavy Forge Corporation in Bethlehem, Pennsylvania, could build the forges while Babcock & Wilcox could provide the heavy nuclear components, for instance. AREVA/Northrop Grumman Shipbuilding broke ground on a heavy components manufacturing facility last June.[10] Further, a number of companies are expanding manufacturing, engineering, and uranium enrichment capabilities—all in the United States. If SMRs are so great, where is the construction? While some designs are closer to market introduction than others, the fact is that America’s **regulatory** and policy environment is not sufficient to support a robust expansion of existing nuclear technologies, much less new ones. New reactor designs are difficult to license efficiently, and the lack of a sustainable nuclear waste management policy causes significant risk to private investment. Many politicians are attempting to mitigate these market challenges by offering subsidies, such as loan guarantees. While this approach still enjoys broad support in Congress and industry, the reality is that it has not worked. Despite a lavish suite of subsidies offered in the Energy Policy Act of 2005, including loan guarantees, insurance against government delays, and production tax credits, no new reactors have been permitted, much less constructed. These subsidies are in addition to existing technology development cost-sharing programs that have been in place for years and defer significant research and development costs from industry to the taxpayer. The problem with this approach is that it ignores the larger systemic problems that create the unstable marketplace to begin with. These systemic problems generally fall into three categories: Licensing. The Nuclear Regulatory Commission (NRC) is ill prepared to build the regulatory framework for new reactor technologies, and no reactor can be offered commercially without an NRC license. In a September 2009 interview, former NRC chairman Dale E. Klein said that small nuclear reactors pose a dilemma for the NRC because the commission is uneasy with new and unproven technologies and feels more comfortable with large light water reactors, which have been in operation for years and has a long safety record.[11] The result is that enthusiasm for building non-light-water SMRs is generally squashed at the NRC as potential customers realize that there is little chance that the NRC will permit the project within a timeframe that would promote near-term investment. So, regardless of which attributes an SMR might bring to the market, the **regulatory risk** is such that real progress on commercialization is difficult to attain. This then leaves large light water reactors, and to a lesser extent, small ones, as the least risky option, which pushes potential customers toward that technology, which then undermines long-term progress, competition, and innovation.

## \*\*\* 2AC

### 2AC—Case

**SMRs are significantly better in all regards than larger alternatives.**

**Szondy 12** (David, Freelance writer and frequent contributor to Gizmag, *Small modular nuclear reactors - the future of energy?*, February 16th, http://www.gizmag.com/small-modular-nuclear-reactors/20860/)

One way of **getting around** many of **these problems** is through the development of small modular reactors (SMR). These are reactors capable of generating about 300 megawatts of power or less, which is enough to run 45,000 US homes. Though small, SMRs are proper reactors. They are quite different from the radio-thermal generators (RTG) used in spacecraft and remote lighthouses in Siberia. Nuclear reactors such as SMRs use controlled nuclear fission to generate power while RTGs use natural radioactive decay to power a relatively simple thermoelectric generator that can only produce, at most, about two kilowatts.

In terms of power, RTGs are the equivalent of batteries while small nuclear reactors are only "small" when compared to conventional reactors. They are hardly the sort that you would keep in the garage. In reality, SMR power plants would cover the area of a small shopping mall. Still, such an installation is not very large as power plants go and a reactor that only produces 300 megawatts may not seem worth the investment, but the US Department of Energy is offering US$452 million in matching grants to develop SMRs and private investors like the Bill Gates Foundation and the company of Babcock and Wilcox are putting up money for their own modular reactor projects.

The 60-year old breakthrough

One reason for government and private industry to take an interest in SMRs is that they've been **successfully employed** for much longer than most people realize. In fact, hundreds have been steaming around the world inside the hulls of nuclear submarines and other warships for sixty years. They've also been used in merchant ships, icebreakers and as research and medical isotope reactors at universities. There was even one installed in the Antarctic at McMurdo Station from 1962 to 1972. Now they're being considered for domestic use.

The case for SMRs

SMRs have a **number of advantages** over conventional reactors. For one thing, SMRs are cheaper to construct and run. This makes them very attractive to poorer, energy-starved countries; small, growing communities that don't require a full-scale plant; and remote locations such as mines or desalination plants. Part of the reason for this is simply that the reactors are smaller. Another is that, not needing to be custom designed in each case, the reactors can be standardized and some types built in factories that are able to employ economies of scale. The factory-built aspect is also important because a factory is more efficient than on-site construction by as much as eight to one in terms of building time. Factory construction also allows SMRs to be built, delivered to the site, and then returned to the factory for dismantling at the end of their service lives - eliminating a major problem with old conventional reactors, i.e. how to dispose of them.

SMRs also enjoy a good deal of design flexibility. Conventional reactors are usually cooled by water - a great deal of water - which means that the reactors need to be situated near rivers or coastlines. SMRs, on the other hand, can be cooled by air, gas, low-melting point metals or salt. This means that SMRs can be placed in remote, inland areas where it isn't possible to site conventional reactors.

Safety

This cooling system is often passive. In other words, it relies more on the natural circulation of the cooling medium within the reactor's containment flask than on pumps. This passive cooling is one of the ways that SMRs can improve safety. Because modular reactors are smaller than conventional ones, they contain less fuel. This means that there's less of a mass to be affected if an accident occurs. If one does happen, there's less radioactive material that can be released into the environment and makes it easier to design emergency systems. Since they are smaller and use less fuel, they are easier to cool effectively, which greatly reduces the likelihood of a catastrophic accident or meltdown in the first place.

This also means that accidents proceed much slower in modular reactors than in conventional ones. Where the latter need accident responses in a matter of hours or minutes, SMRs can be responded to in hours or days, which reduces the chances of an accident resulting in major damage to the reactor elements.

The SMR designs that reject water cooling in favor of gas, metal or salt have their own safety advantages. Unlike water-cooled reactors, these media operate at a lower pressure. One of the hazards of water cooling is that a cracked pipe or a damaged seal can blow radioactive gases out like anti-freeze out of an overheated car radiator. With low-pressure media, there's less force to push gases out and there's less stress placed on the containment vessel. It also eliminates one of the frightening episodes of the Fukushima accident where the water in the vessel broke down into hydrogen and oxygen and then exploded.

Another advantage of modular design is that some SMRs are small enough to be installed below ground. That is cheaper, faster to construct and less invasive than building a reinforced concrete containment dome. There is also the point that putting a reactor in the ground makes it less vulnerable to earthquakes. Underground installations make modular reactors easier to secure and install in a much smaller footprint. This makes SMRs particularly attractive to military customers who need to build power plants for bases quickly. Underground installation also enhances security with fewer sophisticated systems needed, which also helps bring down costs.

SMRs can help with proliferation, nuclear waste and fuel supply issues because, while some modular reactors are based on conventional pressurized water reactors and burn enhanced uranium, others use less conventional fuels. Some, for example, can generate power from what is now regarded as "waste", burning depleted uranium and plutonium left over from conventional reactors. Depleted uranium is basically U-238 from which the fissible U-235 has been consumed. It's also much more abundant in nature than U-235, which has the potential of providing the world with energy for thousands of years. Other reactor designs don't even use uranium. Instead, they use thorium. This fuel is also incredibly abundant, is easy to process for use as fuel and has the added bonus of being utterly useless for making weapons, so it can provide power even to areas where security concerns have been raised.

But there's still the sticking point that modular reactors are, by definition, small. That may be fine for a submarine or the South Pole, but what about places that need more? Is the alternative conventional nuclear plants? It turns out that the answer is no. Modular reactors don't need to be used singly. They can be set up in batteries of five or six or even more, providing as much power as an area needs. And if one unit needs to be taken off line for repairs or even replacement, it needn't interfere with the operation of the others.

**Adaptation is only possible with the AFF.**

**Pittock 10** (Barrie, Led the Climate Impact Group in CSIRO until his retirement in 1999. He contributed to or was the lead author of all four major reports of the Intergovernmental Panel on Climate Change. He was awarded a Public Service Medal in 1999 and is CSIRO Honorary Fellow, Climate Change: The Science, Impacts, and Solutions, 2010, pg. 130)

Because there are uncertainties about future amounts and effects of climate change and sea-level rise, adaptation must be a risk management strategy which takes account of the probabilities as well as of the costs and benefits. Moreover, **adaptation has limits**, beyond which it is too expensive or even unacceptable in terms of the changes it requires. For example, one adaptation to increasing flooding due to sea-level rise in low-lying island countries would be to emigrate, but that may be unacceptable for the people who would have to leave their homelands, and may not be welcomed as a solution by potential host countries. If our ability to adapt reaches its limits we have an unacceptable or damaging situation that, at least at the local level, could be considered 'dangerous' and could lead to dire socio-economic consequences. That can only be avoided if we can reduce the level of climate change so as to stay within the limits of adaptability. In the broadest global terms, our ability to adapt is **what must determine** the targets we set for reducing greenhouse gas emissions, that is, mitigation policies should aim to avoid situations where we exceed the limits of adaptability. For this reason, understanding adaptability is vital, not only so that people can adapt where possible, but also to determine how urgently, and by how much we must reduce global greenhouse gas emissions. Methods of adaptation will vary with the activity or industry, with location, and on different scales in time and space. Generally local farmers, for instance, will adapt on a year-to-year basis to drier or warmer conditions by varying planting dates, crop varieties or irrigation use. But at the district, state or national level longerterm planning may be necessary to breed betteradapted crop varieties, conserve water, or develop more irrigation supplies. If the worst happens, governments may have to aid farmers, or even assist them to leave the industry if it is becoming unsupportable. This is already the case in Australia, where there is disagreement as to whether the current lack of water in some areas is merely a 'drought' from which recovery is possible with short-term aid, or whether it is more permanent, requiring farmers to change their livelihood.

**Plus overshooting is possible.**

**Washington 11** (Haydn and John, An environmental scientist of 35 years’ experience. His PhD ‘The Wilderness Knot’ was in social ecology \*\* the Climate Communication Fellow for the Global Change Institute at the University of Queensland. He studied physics at the University of Queensland, Australia. After the graduating, he majored in solar physics in his post-grad honors year and created the website skepticalscience.com, Climate Change Denial: Heads in the Sand, Published in 2011 by Earthscan, Page 30-31)

It has been suggested that warming the world by more than two degrees could push us into the area where we may cause runaway climate change. It may then take thousands of years to get back to current world temperatures. The world has already warmed by .7 degrees Celsius (Houghton, 2008; Pittock, 2009) and another .6 degrees is in the pipeline (Hansen, 2009). Runaway climate change means that human actions would then be unlikely to stop the temperature increase (short of massive government engineering). Hansen et al. (2008) define the ‘tipping point’ as the climate forcing threat that, if maintained for a long time, gives rise to a specific consequence. They define the ‘point of no return’ as a climate state beyond which the consequence is inevitable, even if climate forcings are reduced. A point of no return **can be avoided**, even if the tipping level is **temporarily exceeded**. This has been called an ‘overshoot’ scenario, where one exceeds the ‘safe’ CO2 level but then removes CO2 to return to that level (Pittock, 2009). Ocean and ice sheet inertia permit overshoot ‘provided the climate forcing is returned below the tipping level **before initiating** irreversible dynamic change’ (Hansen et al, 2008). Points of no return are difficult to define. We may be at a tipping level already at 387 ppm CO2, and it will require strong action to reduce CO2 levels so that we don’t pass the point of no return and can return CO2 levels below 350 ppm. Hansen et al (2008) note we may been to drop CO2 below 325 ppm to restore sea ice to the area it had 25 years ago (and so remove this positive feedback).

### 2AC—Incentive

**C/I – Financial incentives induce behaviors---that includes plan**

**Webb 93** (Kernaghan, Lecturer in the Faculty of Law at the University of Ottawa, “Thumbs, Fingers, and Pushing on String: Legal Accountability in the Use of Federal Financial Incentives”, 31 Alta. L. Rev. 501 (1993) Hein Online)

In this paper, "financial incentives" are taken to mean disbursements 18 of public funds or contingent commitments to individuals and organizations, intended to encourage, support or induce certain behaviours in accordance with express public policy objectives. They take the form of grants, contributions, repayable contributions, loans, loan guarantees and insurance, subsidies, procurement contracts and tax expenditures.19 Needless to say, the ability of government to achieve desired behaviour may vary with the type of incentive in use: up-front disbursements of funds (such as with contributions and procurement contracts) may put government in a better position to dictate the terms upon which assistance is provided than contingent disbursements such as loan guarantees and insurance. In some cases, the incentive aspects of the funding come from the conditions attached to use of the monies.20 In others, the mere existence of a program providing financial assistance for a particular activity (eg. low interest loans for a nuclear power plant, or a pulp mill) may be taken as government approval of that activity, and in that sense, an incentive to encourage that type of activity has been created.21 Given the wide variety of incentive types, it will not be possible in a paper of this length to provide anything more than a cursory discussion of some of the main incentives used.22 And, needless to say, the comments made herein concerning accountability apply to differing degrees depending upon the type of incentive under consideration.¶ By limiting the definition of financial incentives to initiatives where *public funds are either disbursed or contingently committed*, a large number of regulatory programs with incentive *effects* which exist, but in which no money is forthcoming,23 are excluded from direct examination in this paper. Such programs might be referred to as *indirect* incentives. Through elimination of indirect incentives from the scope of discussion, thedefinition of the incentive instrument becomes both more manageable and more particular. Nevertheless, it is possible that much of the approach taken here may be usefully applied to these types of indirect incentives as well.24 Also excluded from discussion here are social assistance programs such as welfare and *ad hoc* industry bailout initiatives because such programs are not designed primarily to *encourage* behaviours in furtherance of specific public policy objectives. In effect, these programs are assistance, but they are not incentives.

**Precision---our definition’s from the DOE**

**Waxman 98** (Solicitor General of the US (Seth, Brief for the United States in Opposition for the US Supreme Court case HARBERT/LUMMUS AGRIFUELS PROJECTS, ET AL., PETITIONERS v. UNITED STATES OF AMERICA, <http://www.justice.gov/osg/briefs/1998/0responses/98-0697.resp.opp.pdf>)

2 On November 15, 1986, Keefe was delegated “the authority, with respect to actions valued at $50 million or less, to approve, execute, enter into, modify, administer, closeout, terminate and take any other necessary and appropriate action (collectively, ‘Actions’) with respect to Financial Incentive awards.” Pet. App. 68, 111-112. Citing DOE Order No. 5700.5 (Jan. 12, 1981), the delegation defines “Financial Incentives” as the authorized financial incentive programs of DOE, “including direct loans, loan guarantees, purchase agreements, price supports, guaranteed market agreements and any others which may evolve.” The delegation proceeds to state, “[h]owever, a separate prior written approval of any such action must be given by or concurred in by Keefe to accompany the action.” The delegation also states that its exercise “shall be governed by the rules and regulations of [DOE] and policies and procedures prescribed by the Secretary or his delegate(s).” Pet. App. 111-113.

### 2AC—Spec

**Substantially means in the main, including the essential part**

**Words and Phrases, 2** (Words and Phrases Permanent Edition, “Substantially,” Volume 40B, p. 324-330 October 2002, Thomson West)

Okla. 1911. “Substantially” means in substance: in the main; essentially; by including the material or essential part.

#### Increase must be a net increase

**Rogers, 05** (Judge, STATE OF NEW YORK, ET AL., PETITIONERS v. U.S. ENVIRONMENTAL PROTECTION AGENCY, RESPONDENT, NSR MANUFACTURERS ROUNDTABLE, ET AL., INTERVENORS, 2005 U.S. App. LEXIS 12378, \*\*; 60 ERC (BNA) 1791, 6/24, lexis)

 [\*\*48]  Statutory Interpretation. [HN16](http://www.lexis.com/research/retrieve?_m=1fe428155fdfc9074f3623f0dae9d78a&docnum=14&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=0ebd338d6a7793de8561db53b915effd&focBudTerms=term%20increase&focBudSel=all#clscc16)While the CAA defines a "modification" as any physical or operational change that "increases" emissions, it is silent on how to calculate such "increases" in emissions. [42 U.S.C. § 7411(a)(4)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=4&_butStat=0&_butNum=103&_butInline=1&_butinfo=42%20U.S.C.%207411&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=1f89a0e47b1996a5400e8d865d8da08a). According to government petitioners, the lack of a statutory definition does not render the term "increases" ambiguous, but merely compels the court to give the term its "ordinary meaning." See [Engine Mfrs.Ass'nv.S.Coast AirQualityMgmt.Dist., 541 U.S. 246, 124 S. Ct. 1756, 1761, 158 L. Ed. 2d 529(2004)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=104&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b541%20U.S.%20246%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=48f016ea3eabfdb898b67b348b11662c); [Bluewater Network, 370 F.3d at 13](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=105&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b370%20F.3d%201%2cat%2013%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=78fdfe9d48c7b91d7659b90c0198707e); [Am. Fed'n of Gov't Employees v. Glickman, 342 U.S. App. D.C. 7, 215 F.3d 7, 10 [\*23]  (D.C. Cir. 2000)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=106&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b342%20U.S.%20App.%20D.C.%207%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=fb18ff0b92931ac00621d88dae997e67). Relying on two "real world" analogies, government petitioners contend that the ordinary meaning of "increases" requires the baseline to be calculated from a period immediately preceding the change. They maintain, for example, that in determining whether a high-pressure weather system "increases" the local temperature, the relevant baseline is the temperature immediately preceding the arrival of the weather system, not the temperature five or ten years ago. Similarly,  [\*\*49]  in determining whether a new engine "increases" the value of a car, the relevant baseline is the value of the car immediately preceding the replacement of the engine, not the value of the car five or ten years ago when the engine was in perfect condition.

### 2AC—QER CP

**Certainty is key – crucial for investment.**

**Trembath 11** (Alex, Policy associate in the Energy and Climate Program at Breakthrough. He is the lead or co-author of several Breakthrough publications, including the 2012 report, 2/4/11, [Nuclear Power and the Future of Post-Partisan Energy Policy](http://leadenergy.org/2011/02/the-nuclear-option-in-a-post-partisan-approach-on-energy/), "Beyond Boom and Bust: Putting Clean Tech on a Path to Subsidy Independence" and "Where the Shale Gas Revolution Came From”, <http://leadenergy.org/2011/02/the-nuclear-option-in-a-post-partisan-approach-on-energy/>)

If there is one field of the energy sector for which certainty of political will and **government policy is essential, it is nuclear power**. High up front costs for the private industry, extreme regulatory oversight and public wariness necessitate a committed government partner for private firms investing in nuclear technology. In a new [report](http://www.thirdway.org/publications/370) on the potential for a “nuclear renaissance,” Third Way references the failed cap-and-trade bill, delaying tactics in the House vis-a-vis EPA regulations on CO₂, and the recent election results to emphasize the difficult current political environment for advancing new nuclear policy. The report, “The Future of Nuclear Energy,” makes the case for political certainty: “It is difficult for energy producers and users to estimate the relative price for nuclear-generated energy compared to fossil fuel alternatives (e.g. natural gas)–an essential consideration in making the major capital investment decision necessary for new energy production that will be in place for decades.” Are our politicians willing to match the level of certainty that the nuclear industry demands? Lacking a suitable price on carbon that may have been achieved by a cap-and-trade bill removes one primary policy instrument for making nuclear power more cost-competitive with fossil fuels. The impetus on Congress, therefore, will be to shift from demand-side “pull” energy policies (that increase demand for clean tech by raising the price of dirty energy) to [supply-side “push” policies](http://leadenergy.org/2010/09/supply-demand-energy-innovation/), or industrial and innovation policies. Fortunately, there are signals from political and thought leaders that a package of policies may emerge to incentivize alternative energy sources that include nuclear power. One place to start is the recently deceased American Power Act, addressed above, authored originally by Senators Kerry, Graham and Lieberman. Before its final and disappointing incarnation, the bill [included](http://www.huffingtonpost.com/2010/05/12/american-power-act-photos_n_573643.html#s90041&title=undefined) provisions to increase loan guarantees for nuclear power plant construction in addition to other tax incentives. Loan guarantees are probably the most important method of government involvement in new plant construction, given the high capital costs of development. One wonders what the fate of the bill, or a less ambitious set of its provisions, would have been had Republican Senator Graham not abdicated and removed any hope of Republican co-sponsorship. But that was last year. The changing of the guard in Congress makes this a whole different game, and the once feasible support for nuclear technology on either side of the aisle must be reevaluated. A New York Times [piece](http://www.nytimes.com/2010/11/17/business/energy-environment/17NUCLEAR.html) in the aftermath of the elections forecast a difficult road ahead for nuclear energy policy, but did note Republican support for programs like a waste disposal site and loan guarantees. Republican support for nuclear energy has roots in the most significant recent energy legislation, the Energy Policy Act of 2005, which passed provisions for nuclear power with wide bipartisan support. Reaching out to Republicans on policies they have supported in the past should be a goal of Democrats who wish to form a foundational debate on moving the policy forward. There are also signals that key Republicans, notably [Lindsey Graham](http://washingtonindependent.com/99171/graham-circulating-clean-energy-standard) and [Richard Lugar](http://www.plattsenergyweektv.com/story.aspx?storyid=132784&catid=293), would throw their support behind a clean energy standard that includes nuclear and CCS. Republicans in Congress will find intellectual support from a group that AEL’s Teryn Norris coined [“innovation hawks,”](http://leadenergy.org/2011/01/the-rise-of-innovation-hawks/) among them Steven Hayward, David Brooks and George Will. Will has been [particularly outspoken](http://www.newsweek.com/2010/04/08/this-nuclear-option-is-nuclear.html) in support of nuclear energy, writing in 2010 that “it is a travesty that the nation that first harnessed nuclear energy has neglected it so long because fads about supposed ‘green energy’ and superstitions about nuclear power’s dangers.” The extreme reluctance of Republicans to cooperate with Democrats over the last two years is only the first step, as any legislation will have to overcome Democrats’ traditional opposition to nuclear energy. However, here again there is reason for optimism. Barbara Boxer and John Kerry bucked their party’s long-time aversion to nuclear in a precursor bill to APA, and Kerry continued working on the issue during 2010. Jeff Bingaman, in a speech earlier this week, reversed his position on the issue by calling for the inclusion of nuclear energy provisions in a clean energy standard. The Huffington Post [reports](http://www.huffingtonpost.com/2011/02/01/sen-jeff-bingaman-backs-n_n_816864.html) that “the White House reached out to his committee [Senate Energy] to help develop the clean energy plan through legislation.” This development in itself potentially mitigates two of the largest obstacle standing in the way of progress on comprehensive energy legislation: lack of a bill, and lack of high profile sponsors. Democrats can also direct [Section 48C](http://leadenergy.org/2010/12/clean-energy-financing-first-steps-towards-post-partisan-effort/#more-3320) of the American Recovery and Reinvestment Act of 2009 towards nuclear technology, which provides a tax credit for companies that engage in clean tech manufacturing. Democrats should not give up on their policy goals simply because they no longer enjoy broad majorities in both Houses, and Republicans should not spend all their time holding symbolic repeal votes on the Obama Administration’s accomplishments. The lame-duck votes in December on “Don’t Ask, Don’t Tell,” the tax cut deal and START indicate that at least a few Republicans are willing to work together with Democrats in a divided Congress, and that is precisely what nuclear energy needs moving forward. It will require an agressive push from the White House, and a concerted effort from both parties’ leadership, but the road for forging bipartisan legislation is not an impassable one. The politician with perhaps the single greatest leverage over the future of nuclear energy is President Obama, and his rhetoric matches the challenge posed by our aging and poisonous energy infrastructure. “This is our generation’s Sputnik moment,” announced Obama recently. Echoing the calls of presidents past, the President used his [State of the Union](http://www.slate.com/id/2281847/) podium to signal a newly invigorated industrialism in the United States. He advocated broadly for renewed investment in infrastructure, education, and technological innovation. And he did so in a room with many more members of the opposition party than at any point during the first half of his term. The eagerness of the President to combine left and right agendas can hopefully match the hyper-partisan bitterness that dominates our political culture, and nuclear power maybe one sector of our economy to benefit from his political leadership.

**DoD already established its recommendations for SMR adoption.**

**King 11** (Marcus King, Ph.D., Center for Naval Analyses Project Director and Research Analyst for the Environment and Energy Team LaVar Huntzinger, Thoi Nguyen, March 2011, Feasibility of Nuclear Power on U.S. Military Installations, www.cna.org/sites/default/files/research/Nuclear Power on Military Installations D0023932 A5.pdf)

Recognizing nuclear power as a potential benefit to Department of Defense (DoD) facilities, Congress directed the DoD, in section 2845 of the National Defense Authorization Act (NDAA) of 2010, to “conduct a study to assess the feasibility of developing nuclear power plants on military installations” [12]. Specifically, the study is to consider the following topics:¶ • Options for construction and operation¶ • Cost estimates and the potential for life-cycle cost savings¶ • Potential energy security advantages¶ • Additional infrastructure costs¶ • Effect on the quality of life of military personnel¶ • Regulatory, state, and local concerns¶ • Effect on operations on military installations¶ • Potential environmental liabilities¶ • Factors that may impact safe colocation of nuclear power plants on military installations¶ • Other factors that bear on the feasibility of developing nuclear power plants on military installations.¶ To meet this requirement, the office of the Deputy Under Secretary of Defense for Installations and Environment, DUSD(I&E), asked CNA to conduct this feasibility study. The CNA effort was directed by a steering group consisting of representatives from DUSD (I&E), each of the military departments, DOE, NRC, and DOE Labs. This report documents our analysis and findings.

**And it recommended against being an early adopter—proves the CP can’t establish a bureaucratic consensus for the plan**

**King 11** (Marcus King, Ph.D., Center for Naval Analyses Project Director and Research Analyst for the Environment and Energy Team LaVar Huntzinger, Thoi Nguyen, March 2011, Feasibility of Nuclear Power on U.S. Military Installations, www.cna.org/sites/default/files/research/Nuclear Power on Military Installations D0023932 A5.pdf)

The most significant risk for SMR power plants is associated with being an **early adoptor** of new technology. **From a DoD perspective**, economic feasibility depends on negotiating arrangements for the project that ensure DoD is not responsible for FOAK expenses. Having contractor owners and operators would reduce operating risks associated with being an early adoptor. If partners can’t be found who are willing to bear the FOAK and early adoptor risks then DoD should not undertake such a project. The recent MOU between DOE and DoD identifies a framework for cooperation and partnership for sharing risks associated with this type of project.

**DOD will undermine the CP during the decision process**

**Butler 11** (Lt. Col. USMC - LtCol Butler HQ, NORAD Strategy, Policy, and Plans Directorate, Security Cooperation Integration Branch, Chase Prize Essay Winner for this Article, 18 Mar 2011, Marine Corps Gazette, Not Green Enough, Why the Marine Corps should lead the environmental and energy way forward and how to do it, LtCol Glen Butler, http://www.mca-marines.org/gazette/not-green-enough )

Yet despite the advances in safety, security, and efficiency in recent years, **nuclear in the energy equation remains the new “n-word” for most military circles**. And despite the fact that the FY10 National Defense Authorization Act called on the DoD to “conduct a study [of] the feasibility of nuclear plants on military installations,” the Office of the Secretary of Defense has yet to fund the study.33

**No implementation.**

**Barlas 12** (Stephen, Columnist @ Financial Executive, 1/1, Lexis)

But it is highly unlikely that Obama's blueprint will lead to a firmer footing for U.S. energy security than past so-called blueprints from other presidents, or perhaps more importantly, whether a print is even necessary. Obama's policy is a loosely knit set of policies that focus on producing more oil at home and reducing dependence on foreign oil by developing cleaner alternative fuels and greater efficiency. The Obama plan is not the result of any particular deep thinking or strategy. The President's Council of Advisors on Science and Technology (PCAST) called for the development of such a strategy in its November 2010 Report to the President on Accelerating the Pace of Change in Energy Technologies. Through an Integrated Federal Energy Policy. PCAST called for a Quadrennial Technology Review (QTR) as the first step in preparing a Quadrennial Energy Review. DOE completed the QTR in November 2011, six months after Obama published his blueprint. Steven E. Koonin, former undersecretary of Energy for Science, says QTR is limited in scope and all DOE felt it could get done given budget and time. "Technology development absent an understanding and shaping of policy and market context in which it gets deployed is not a productive exercise," he says. At this point there is no indication that DOE will even undertake the much more important QER, much less complete it any time soon. The larger reality is that any energy independence plan proposed by any U.S, president--whether based on a QER or not--has as much a chance of coming to fruition as Washington's football Redskins have of getting into the Super Bowl. But regardless of the rhetoric of president after president, maybe the U.S. doesn't even need an energy independence or energy security policy. Natural Gas Making Inroads The biggest energy input for industrial and commercial business users is natural gas. Natural gas prices are incredibly important, both because the fuel is used directly to run industrial processes, heat facilities and commercial buildings and make products such as fertilizers, pharmaceuticals, plastics and other advanced materials. Thanks to the shale revolution, EIA forecasts natural gas prices will stay low for the foreseeable future, rising to $4.66 m/BTU in 2015 and $5.05 m/BTU in 2020. That is good news for the owners of 15,000 to 17,000 industrial boilers in this country, most of which use natural gas (and many of those who still use coal are switching to natural gas). In addition, companies such as Dow Chemical Co. are restarting operations at facilities idled during the recession, Bayer AG is in talks with companies interested in building new ethane crackers at its two industrial parks in West Virginia and Chevron Phillips Chemical Co. and LyondellBasell Co., are considering expanding operations in the United States. Fracking has also had a much less remarked-upon effect on petroleum prices, which are important to businesses with transportation fleets. New oil sources are spurting from the Bakken (stretching from Canada to North Dakota and Montana) and Eagles Ford (South Texas) shale plays. U.S. oil prices have fallen from $133.88 a barrel of Texas intermediate crude in June 2008 to around $86.07. EIA predicts oil prices will rise to $94.58/bbl in 2015 and $108.10/bbl in 2020. Beyond the flood of natural gas washing over them, U.S. companies are also benefitting from three decades of investments--most of which were made without federal subsidies, or support--into facility energy efficiency. Ralph Cavanagh, co-director of the Energy Program at the Natural Resources Defense Council and a member of the Electricity Advisory Board at DOE, says the most important single solution for U.S. businesses worried about energy prices and access is aggressive energy efficiency. "Energy independence is the wrong issue," Cavanagh says. "It is reducing the cost of energy services and improving energy security. "U.S. business has done a tremendous job in energy efficiency over the past three decades," he adds. "It takes less than one-half of a unit of energy to create $1 of economic value than it did in 1973. Industry has done that by upgrading the efficiency of process equipment and upgrading lighting." Others may well argue that the U.S. needs, and has always needed, an energy policy, but one narrowly targeted. Kenneth B Medlock III, deputy director, Energy Forum at the James A Baker III Institute for Public Policy at Rice University, notes that DOE and the Gas Research Institute helped develop, with federal funding, the horizontal drilling (i.e. fracking) technology that Mitchell Energy and Development Corp. (now a part of Devon Energy Corp.) pioneered. "Government ought to be focused on research and development," Med-lock notes. He also is a supporter of loan guarantees to promote investment activity in frontier technologies, and argues that as long as there are more good bets than bad bets in that kind of portfolio, the funds committed in total are a good investment. But spectacular failures of energy companies such as Solyndra Corp., the Chapter 11 filing of Beacon Power Corp. and other less publicized busts reduce, if not kill, the prospect of any additional congressional funding for energy loan guarantees of any kind. That is true even when legislation has bipartisan support, which is the case for the Energy Savings and Industrial Competitiveness Act of 2011 (S. 1000), which would, among other things, provide grants for a revolving loan program designed to develop energy-saving technologies for industrial and commercial use. The bill passed the Senate Energy Committee by a vote of 18-3 in July. However, the Congressional Budget Office has pegged the cost of the bill's provisions at $1.2 billion over five years. That is a serious barrier to passage. And in any case, even if it did pass, the bill would simply authorize funding. Congressional appropriations committees would have to approve the money as part of DOE's budget, which would be highly unlikely, Solyndra aside, since similar programs authorized by the 2005 and 2007 energy bills are still begging for appropriations. Besides impact on the federal deficit, politics, too, often impede progress on otherwise sensible policies. Politics apparently have clogged up the proposed Keystone XL oil pipeline extension from Canada. Environmentalists, a Democratic constituency, oppose the project, arguing it would create more greenhouse gas emissions than necessary and pose a potential drinking water danger for Nebraska residents because it passed over the Ogallala Aquifer. That view is shared by Nebraska's Republican Gov. Dave Heineman, whose views are opposite those of all the can presidential candidates, each of whom supported U.S. approval of Keystone XL. Labor unions, another key Democratic constituency, support the project that TransCanada, the project sponsor, says will bring more than 11 8,000 person-years of employment to workers in the states of Montana, South Dakota and Nebraska. If the Keystone debate features Democrats versus Democrats and Republicans versus Republicans, efforts to substitute domestic natural gas for foreign petroleum features business versus business.

**Should means ought.  
Howard 5** (Taylor and Howard, 05 - Resources for the Future, Partnership to Cut Hunger and Poverty in Africa (Michael and Julie, “Investing in Africa's future: U.S. Agricultural development assistance for Sub-Saharan Africa”, 9/12, http://www.sarpn.org.za/documents/d0001784/5-US-agric\_Sept2005\_Chap2.pdf)

Other legislated DA earmarks in the FY2005 appropriations bill are smaller and more targeted: plant biotechnology research and development ($25 million), the American Schools and Hospitals Abroad program ($20 million), women’s leadership capacity ($15 million), the International Fertilizer Development Center ($2.3 million), and clean water treatment ($2 million). Interestingly, in the wording of the bill, Congress uses the term shall in connection with only two of these eight earmarks; the others say that USAID should make the prescribed amount available. The difference between shall and should may have legal significance—one is clearly mandatory while the other is a strong admonition—but it makes little practical difference in USAID’s need to comply with the congressional directive to the best of its ability.

development are funded and pursued aggressively in 2012.

### 2AC—REM DA

**There is significant global nuclear growth.**

**Adnani 6/7** (Amir, Founder of Uranium Energy Corp. and has served as the president, CEO and a director since 2005, Under his leadership, Uranium Energy has become North America’s newest uranium-producing company and the first uranium producer in the U.S. in more than seven years. The company has achieved its prime status, including the broad support of major securities analysts and institutional investors, due in large part to Adnani’s early and continuing focus on bringing many of the uranium industry’s most experienced technical personnel into management, *Uranium Investing – Why Nuclear Power Has A Bright Future*, http://oakshirefinancial.com/2012/06/07/uranium-investing-why-nuclear-power-has-a-bright-future/)

If you asked Amir Adnani, chief executive of Uranium Energy Corp., why he was so bullish about uranium in 2007, his answer would be the same as it is today: There is not enough supply to meet demand. Investors might wonder if Fukushima has drawn the curtain on this industry, but Adnani says in this exclusive interview with The Energy Report that this is just the first act for nuclear power. Adnani is taking advantage of what he sees as a once-in-a-lifetime opportunity to grow his Texas-based company, snapping up properties that are now “on sale.”

The Energy Report: More than a year after a tsunami left the Fukushima nuclear reactor in Japan without the ability to sufficiently cool itself, Japan shut down the Tomari 3 nuclear reactor, leaving all 44,200 megawatts (MW) of the country’s nuclear capacity idle with no set date for restart. When investors hear news like that, they might get the impression that nuclear power is a sunset industry. What’s your take?

Amir Adnani: There is no doubt that the nuclear disaster in Japan has been one of the more challenging events facing the industry. Although just a couple weeks after those reactors were taken off-line, a town with two reactors in the western prefecture of Fukui voted in favor of restoring operations. Prime Minister Yoshihiko Noda and the federal government now have to make the final decision and several media outlets are reporting that the government may order the restart of two reactors next week. Many industry observers and analysts are expecting about 20–30 of the reactors to come back on-line over the course of the next year.

Japan is very much dependent on nuclear power. About one-third of Japanese electricity was generated through nuclear power prior to Fukushima. As recently as this February, major industries, like Japan’s steelmakers, have been urging the early restart of nuclear power plants. They fear potential power cuts and the rising costs associated with electricity from fossil fuels could affect their viability. Japan is a major export economy and has very energy-intensive industries to maintain and run competitively. Nuclear power will ultimately, in my opinion, be part of the energy mix in Japan. With time, we’ll see plants come back on-line.

TER: Is that enough to assuage investor concerns? What about what’s happened in Germany, Switzerland and some other European nations that have curtailed energy produced by nuclear reactors?

AA: Certainly investors have sold off uranium holdings based on the situation in Japan and I believe there was both an emotional and political knee-jerk reaction toward the industry. However, if we **take a closer look** at this through a sober vantage point, the effects of Germany phasing its reactors offline by 2022 is not nearly as material as the flip side of it: There remains **significant nuclear growth** in developing markets. Led by China and India, countries like Russia, South Korea and even oil-rich nations like Saudi Arabia and the **U**nited **A**rab **E**mirates are planning to build reactors that would nearly double the world’s installed nuclear capacity by 2030. These countries continue to see nuclear power’s unique ability to generate baseload power in a carbon dioxide-free and low-cost way as a very big advantage in their energy mix.

TER: Where is the growth for nuclear in a post-Fukushima world going to come from?

AA: The growth in the nuclear industry is going to come from exactly where it was going to come from pre-Fukushima. The countries and the economies that are expanding most rapidly are the ones that really need more power. The growth isn’t going to come from the West. In fact, only 3% of the reactors that are under construction right now—there are about 65 reactors under construction—are in G7 countries. The top four markets are China, Russia, India and South Korea. Saudi Arabia plans to build 16 nuclear reactors, which is a $400 billion program. Chinese officials have reiterated the country’s plans to grow its nuclear capacity to about 70 gigawatts (GW) by 2020. India plans to get to about 60–63 GW of installed nuclear capacity by 2030 and it further aims to supply 25% of electricity from nuclear power by 2050.

The plans to develop nuclear power in China and other countries are very much driven by a set of realities that is very different and very acute. People are dying every year in China, literally choking to death, because of all of the nasty toxins that are being put into the environment by burning coal. It takes a lot of infrastructure to get coal into various places in China where some of that infrastructure doesn’t exist yet. No other form of power can match nuclear power’s ability to generate electricity in a low-cost, emission-free manner on a baseload scale.

Having said that, there is incremental growth in the developed world, too. The U.S. Nuclear Regulatory Commission approved four licenses earlier this year for operating nuclear reactors to come on-line in Georgia and South Carolina. They are the first licenses of this type to be issued in the U.S. in almost 30 years. Even in the United Kingdom there have been announcements to build seven or eight new nuclear reactors. It is very positive to see those developments post-Fukushima.

**Especially in Asia.**

**Peimani 11** (Hooman, Member of the Journal of Energy Security Editorial Advisory Board and is the Head of the Energy Security Division at the Energy Studies Institute, National University of Singapore, *Nuclear Energy in Asia: A Post-Fukushima Perspective*, Journal of Energy Security, May 2011)

On March 11, 2011 a massive earthquake and accompanying tsunami devastated a significant part of coastal mainland Japan north of Tokyo. The loss of over 25,000 lives and major damage to residential, commercial and industrial parts of Japan have been overshadowed by round-the-clock news coverage concerning the accident at the Fukushima nuclear power plant. Exaggerated accident reports have prompted a debate on the wisdom of nuclear power generation. Thus, they have created a sentiment in Europe and North America discouraging expansion of their nuclear power sectors and encouraging a debate for their scaling down and eventual decommissioning.

These developments will not likely have a significant impact on the expansion of the nuclear power sector in Asia. In fact the Asia-Pacific region is the principle region for new global nuclear reactor projects. The Asian continent is determined to continue expanding its nuclear sector despite the Fukushima accident. The fundamental factors demanding the expansion of the nuclear sector in the pre-Fukushima period are still valid today across Asia; they will likely continue to remain so into the foreseeable future, ensuring Asia’s global rank as the main arena for new nuclear power facility development.

Reports on the Fukushima accident have portrayed it as another Chernobyl. This unrealistic picture has been the result of various factors and has helped create fear among many people regarding the accident’s negative effect on human health and safety. Hence, it is important to make a distinction between the myth and the reality of the Fukushima accident in order to understand why Asia will remain committed to its nuclear projects despite the accident.

Background

The Fukushima Nuclear Power Plant (FNPP) consisted of six reactors, three of which were inactive at the time of the natural disasters. The other three were successfully shut off when the earthquake shook the facility. The plant survived an unprecedented 9.1 magnitude earthquake only to be damaged by the accompanying tsunami. The tsunami damaged the cooling system and its backup-systems, which caused reactor overheating and subsequently the explosion of built-up hydrogen within the facility (but not the explosion of the rectors’ cores containing fuel rods). The existence of containment structures around the cores prevented massive leakage of radioactive material into the environment. This is unlike Chernobyl when the explosion of its core lacking an appropriate containment structure released a large amount of radioactive smoke into the atmosphere. The released (massive) amount of radiation hovered over the surrounding region and eventually drifted into European parts of then the Soviet Union as well as into other parts of Europe. The FNPP’s containment structures prevented a similar release of radioactive material, but a leak through the cooling system led to release of such material estimated to be about 10% of that of Chernobyl in a much smaller area in the FNPP’s vicinity.

To date, neither the Japanese nuclear authorities nor the International Atomic Energy Agency (IAEA) have reported any deaths, injuries or medical complications caused by radiation exposure among the Japanese population. As a precautionary measure, Japanese authorities evacuated people living in the affected area (a 20 km radius extended in certain areas) and banned the distribution of vegetables and dairy products produced there after above-normal measures of radiation were detected. While clean-up will take a long time (possibly decades in the immediately affected regions), the accident now seems to be under control. To this date, measurements of radiation in Japan and elsewhere have not detected high levels of radiation dangerous to health. As a result, the Fukushima accident is not a case on par with Chernobyl although it has been significant enough to raise public concerns.

Asian nuclear projects

After decades of decline, certain factors have contributed to renewed interest in nuclear energy as a substitute for fossil energy across Asia, in particular in the Asia-Pacific region which has a fast-growing demand for energy. These factors include the severity of air pollution, global warming (caused mainly by CO2 emitted by fossil fuels) and a heavy reliance on imported oil and to a lesser extent gas with potential economic, financial and political implications for importing nations. This has lead to a recognized need to diversify the region’s energy mix. The absence of nuclear-related disasters since Chernobyl has mainly calmed legitimate concerns about the potential safety of nuclear energy.

Asia’s revival of interest in nuclear energy has manifested itself in about **100 nuclear projects** of various scales. All of these are either under consideration, have already been negotiated and signed off on, or close to implementation. **China** accounts for the bulk of these projects; it has the largest number of ongoing projects worldwide (24). China is followed by South Korea (6) and India (4). However, there are many others, including Taiwan (2), Pakistan (1) and Japan (1). Other nuclear enthusiasts include Iran, which, despite UN sanctions, finally completed its Bushehr Nuclear Reactor (1000 MW) on 21 August 2010 with Russian assistance. Work continues in Iran on the 360 MW Darkhovin nuclear plant in its Khuzestan Province, and it has also announced plans for other Iranian-designed medium-sized nuclear power plants. Iran has a plan to build enough nuclear capacity to generate 20,000 MW of power over the next 20 years. To put this in perspective this will require constructing 19 more reactors on the scale of Bushehr. In Southeast Asia, Vietnam has embarked on constructing a power plant consisting of four nuclear reactors (4 X 1000 MW light water reactors) with the assistance of Russia (for two reactors) and Japan (for the other two). Preliminary work has started on one Russian reactor scheduled for completion in 2020.

Asian reaction to the Fukushima accident

Fukushima has created a sense of panic in many parts of the world. This is especially true in North America and Europe, which have not been major nuclear enthusiasts for decades. The major exception to this has been France, which produces about 75% of its electricity from nuclear reactors. In the Asia-Pacific region, there is no indication of serious plans to reverse the regional nuclear power program or to downsize it.

Regional countries with active nuclear sectors or serious plans for building them in the region have mainly confined themselves to taking precautionary measures to increase the safety of their programs to appease their respective peoples’ concerns. Hence, contrary to the situation in North America and Europe, all of the mentioned Asian countries have remained committed to the continuity of their nuclear programs despite Fukushima. The main reasons for such commitments include a lack of adequate domestic fossil energy resources leading to a heavy reliance on imported fossil energy (oil, gas and/or coal). Other reasons include the financial, economic, political and security implications of such reliance for net energy importers, a rapid depletion of fossil energy-rich countries’ domestic reserves, a need for the diversification of the energy mix in Asian countries and the necessity to decrease greenhouse gas emissions to curb global warming.

A commitment to nuclear energy is evident in the following summary of the reaction to the Fukushima accident in Asia-Pacific region.

### 2AC—Accidents DA

**SMR reactors are uniquely safe.**

**Rosner 11** (Robert – Past Director of the Argonne National Laboratory, The William E. Wrather Distinguished Service Professor @ the Departments of Astronomy and Astrophysics and Physics, Enrico Fermi Institute, and the College, Senior Fellow @ the Computation Institute (CI), Stephen Goldberg – Special assistant to the director at Argonne National Laboratory, *Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.*, Energy Policy Institute at Chicago The Harris School of Public Policy Studies, Technical Paper, November 2011)

2.0 SAFETY CASE FOR SMRs

While the focus in this paper is on the business case for SMRs, the safety case also is an important element of the case for SMRs. Although SMRs (the designs addressed in this paper) use the same fuel type and the same light water cooling as gigawatt (GW)-scale light water reactors (LWRs), there are significant enhancements in the reactor design that contribute to the upgraded safety case. Appendix A provides a brief overview of the various technology options for SMRs, including the light water SMR designs that are the focus of the present analysis.

Light water SMR designs proposed to date incorporate passive safety features that utilize gravity-driven or natural convection systems – rather than engineered, pump-driven systems – to supply backup cooling in unusual circumstances. These passive systems should also minimize the need for prompt operator actions in any upset condition. The designs rely on natural circulation for both normal operations and accident conditions, requiring no primary system pumps. In addition, these SMR designs utilize integral designs, meaning all major primary components are located in a single, high-strength pressure vessel. That feature is expected to result in a much lower susceptibility to certain potential events, such as a loss of coolant accident, because there is no large external primary piping. In addition, light water SMRs would have a much lower level of decay heat than large plants and, therefore, would require less cooling after reactor shutdown. Specifically, in a **post-Fukushima** lessons-learned environment, the study team believes that the current SMR designs have three inherent advantages over the current class of large operating reactors, namely:

1. These designs mitigate and, potentially, eliminate the need for back-up or emergency electrical generators, relying exclusively on robust battery power to maintain minimal safety operations.

2. They improve seismic capability with the containment and reactor vessels in a pool of water underground; this dampens the effects of any earth movement and greatly enhances the ability of the system to withstand earthquakes.

3. They provide large and robust underground pool storage for the spent fuel, drastically reducing the potential of uncovering of these pools.

These and other attributes of SMR designs present a strong safety case. Differences in the design of SMRs will lead to different approaches for how the Nuclear Regulatory Commission (NRC) requirements will be satisfied. Ongoing efforts by the SMR community, the larger nuclear community, and the NRC staff have identified licensing issues unique to SMR designs and are working collaboratively to develop alternative approaches for reconciling these issues within the established NRC regulatory process. These efforts are summarized in Appendix B; a detailed examination of these issues is beyond the scope of this paper.

**2AC—Politics DA**

**Obama not negotiating on the debt limit**

**REUTERS 1 – 1 – 13** After fiscal win, Obama warns Congress on debt fight, <http://www.reuters.com/article/2013/01/02/us-usa-fiscal-obama-idUSBRE8BT04S20130102>

Speaking after winning a "fiscal cliff" victory, President Barack Obama vowed on Tuesday to avoid a repeat of last year's divisive fight with Congress over an extension of the nation's borrowing authority.

"While I will negotiate over many things, I will not have another debate with this Congress about whether or not they should pay the bills they have already racked up," Obama said in remarks in the White House.

He urged "a little less drama" in coming budget talks about cutting government spending.

**Obama has no agenda.**

**AP 12/26** [Charles Babington, Obama Agenda Provides Long Work List To Tackle When He Returns, <http://www.timesleaderonline.com/page/content.detail/id/543590/Obama-has-lengthy-work-list-to-tackle.html?nav=5010>]

Even with a full plate of challenges and a hostile party controlling the House, she said, "I think Obama absolutely has to go big on immigration."

The White House has declined to detail the president's plans for a second-term agenda. Once the deficit-spending problems known as the "fiscal cliff" are addressed, said White House spokeswoman Jamie Smith, "President Obama looks forward to working on a number of issues that are critical to our future, from immigration to energy, to education and national security direction."

**Now thumpers –**

**1 - Energy.**

**Weber 1/1** Fox News Analyst [Joseph Weber, Guns, immigration, fiscal issues emerge as top priorities for Obama, new Congress, http://www.foxnews.com/politics/2013/01/01/gun-control-immigration-reform-fiscal-issues-emerge-as-top-issues-for-new/]

The president on Sunday said energy issues are also on his high-priority list, specifically how the country can produce more energy in environmentally conscious ways, and mentioned 15 times in an interview with NBC News the need for further deficit reduction.

Congressional leaders appeared reluctant over the lame duck session to say what will be their top priorities.

A spokesman for House Majority Leader Eric Cantor, whose office plays a major role in setting the agenda, said lawmakers were focused on solving the fiscal crisis.

**2 - Wind PTC**

**Daily Caller 1/1** [‘Fiscal cliff’ deal includes one-year extension for wind tax credits, <http://dailycaller.com/2013/01/01/fiscal-cliff-deal-includes-one-year-extension-for-wind-tax-credits/>]

According to the Congressional Budget Office, extensions of energy tax benefits will cost more than $10.3 billion over five years and more than $18.1 billion over ten years. The Joint Committee on Taxation reported that a one-year extension of the wind PTC alone would cost $12.1 billion.

The federal wind Production Tax Credit was implemented in 1992 to get the wind industry on its feet, and has since been renewed seven times. The tax credit extension divided Republicans on Capitol Hill.

In September, forty-seven House Republicans sent a letter in September to House Speaker John Boehner urging him to allow the wind PTC to expire.

“We believe that the Solyndra scandal has demonstrated that it is time for the federal government to stop picking winners and losers in the energy marketplace,” the letter said. “Twenty years of subsidizing wind is more than enough.”

**4 - Hagel.**

**Walt 12/26** The Robert and Renée Belfer professor of international relations at Harvard University [Stephen M. Walt, What's at stake in the Hagel affair, http://walt.foreignpolicy.com/posts/2012/12/26/whats\_at\_stake\_in\_the\_hagel\_affair]

Three aspects of the affair do merit brief comment, however. First, I'm baffled by the Obama administration's handling of the whole business. What in God's name were they trying to accomplish by floating Hagel's name as the leading candidate without either a formal nomination or a vigorous defense? This lame-brained strategy gave Hagel's enemies in the Israel lobby time to rally their forces and turn what would have been a routine appointment into a cause célèbre. If Obama backs down to these smear artists now, he'll confirm the widespread suspicion that he's got no backbone and he'll lose clout both at home and abroad. If he goes ahead with the appointment (as he should), **he'll** have to spend a bit of political capitaland it will be a distraction from other pressing issues. And all this could have been avoided had the White House just kept quiet until it was ready to announce its nominee. So whatever the outcome, this episode hardly reflects well on the political savvy of Obama's inner circle.

**5 - Gun control.**

**Nye 12/31** [JAMES NYE and MIKE JACCARINO, Daily Mail, http://www.dailymail.co.uk/news/article-2254868/Obama-Gun-control-President-opens-Meet-Press-Newtown-massacre.html?ito=feeds-newsxml]

Obama book ended his revelation with **vows to put his 'full weight' behind the push for new gun control legislation** aimed at avoiding another massacre of the like that robbed 20 first graders' - and six adults - of the their lives at Sandy Hook Elementary School in Newtown, Connecticut on Dec. 14.

'It is not enough for us to say, 'This is too hard so we're not going to try,' Obama said. 'So what I intend to do is I will call all the stakeholders together. I will meet with Republicans. I will meet with Democrats. I will talk to anybody.'

When Gregory expressed skepticism he could galvanize Americans on the the issue of gun control, Obama referenced an iconic Oval Office predecessor who also confronted entrenched and accepted traditions that many felt had to change in the interest of the public good.

'This is not going to be simply a matter of me spending political capital,' Obama said. 'One of the things you learn, having now been in this office for four years, is the old adage of Abraham Lincoln's. That with public opinion there's nothing you can't do and without public opinion there's very little you can get done in this town.

'So I'm going to be putting forward a package and I'm going to be putting my full weight behind it. And I'm going to be making an argument to the American people about why this is important and why we have to do everything we can to make sure that something like what happened at Sandy Hook Elementary does not happen again.'

Obama's comments come as the schoolroom shooting has elevated the issue of gun violence to the forefront of public attention.

Authorities say the shooter, Adam Lanza, killed himself and also killed his mother at their home.

The slayings have prompted renewed calls for greater gun controls. The National Rifle Association has resisted those efforts vociferously, arguing instead that schools should have armed guards for protection.

'I am skeptical that the only answer is putting more guns in schools,' Obama said. 'And I think the vast majority of the American people are skeptical that that somehow is going to solve our problem.'

Obama said he intended to press the issue with the public.

**'Will there be resistance? Absolutely there will be resistance,**' he said.

**No PC.**

**Gillespie 1/2** Editor in chief of Reason.com and Reason TV [Nick Gillespie, Fiscal Cliff Deal Raises Taxes, Delays Sequestration...And Will Cut Spending!, <http://reason.com/blog/2013/01/02/fiscal-cliff-deal-raises-taxes-delays-se>]

Obama got his bump up during his first year or so in office. Part of it was due to George W. Bush greasing the skids by bailing out the big banks and GM and Chrysler, part of it due to Obama's decisive win over John McCain. But even his re-election **hasn't given him political capital** to spend after a first term spent pushing through a still-unpopular health-care plan that's gonna be a total bear to implement over the next couple of years. And **everyone knows he's got no second-term agenda** (if he had, we would have heard about it sometime during last year's campaign, wouldn't we have?).

Anything can happen of course.

**Plan popular.**

**1 – appropriations cover.**

**Sullivan 10** (Mary Anne Sullivan – Partner in Hogan Lovells' energy practice in Washington, D.C., Daniel F. Stenger – Partner in Hogan Lovells' energy practice in Washington, D.C., Amy C. Roma – Senior associate in Hogan Lovells' energy practice in Washington, D.C., *Are Small Reactors the Next Big Thing in Nuclear?*, November 2010, Electric Light & Power, Nov/Dec2010, Vol. 88 Issue 6, p46)

Congress

SMRs have enjoyed **bipartisan support** in Congress. The House Committee on Science and Technology and the Senate Energy and Natural Resources Committee have approved similar legislation designed to promote the development and deployment of SMRs along the lines the DOE has proposed. Promoting SMR development in legislation has its price.

The Congressional Budget Office recently estimated that the Senate bill would cost $407 million over the next five years to support cost-sharing programs with private companies for the development of two standard SMR designs. Costs for the out-years were not included in the estimate, but the bill would require the DOE to obtain NRC design certifications for the reactors by 2018 and to secure combined construction and operating licenses by Jan. 1, 2021.

If Congress can pass an energy bill, it seems likely the bill **will support SMRs**. Even in the absence of new authorizing legislation, however, **appropriations bills** that must be passed to **keep the government running** almost certainly will contain strong support for the DOE's research and development program for SMRs.

SMRs respond to a critical suite of power needs: reliable, low-carbon, baseload generation at a manageable capital cost for even small utilities. But as with many other power solutions, much still needs to happen to realize the promise.

**Winners win.**

**Hunter 10** [Daily Kos Contributing Editor, *Political death by a thousand cuts*, http://www.dailykos.com/storyonly/2010/11/17/921164/-Political-death-by-a-thousand-cuts]

It may be a petty, minor thing, but this is getting to the point where Obama is looking weak in many, many separate situations, and it's becoming a car wreck for the White House. Having him doing public post-election soul searching; having him give repeated noises in the press about preemptively caving on whatever it is the GOP might be asking for: it's a messaging/political disaster. He took a stout midterm loss and turned it into his own midterm disaster. At some point someone in this White House has to start figuring out that, screw actual policy, they're getting their asses kicked purely on the PR front, and Obama's not going to get reelected if he looks like a quivering pushover. We know from the healthcare fiasco that there's a bunch of folks in this White House who care more about protecting Obama's image than actually getting useful stuff done: well, image-hoarders, now might be the perfect time to pay attention to what the nice news channels are telling you. Instead, this is rapidly becoming another perfect example of being so miserly with your "limited" political capital that you end up losing all of it. Obama is keeping his powder so dry that he's losing battles without firing a shot. Long story short, if McConnell or Boehner can't find time to meet at the president's convenience, Obama should just call off the meeting and be done with it. When you're President of the United States you shouldn't be losing pissant little power plays.

**Plan solves the economy ---**

**Job growth.**

**Fertel 9** (35 years of experience consulting for electric utilities on issues related to designing, siting, licensing and managing both fossil and nuclear plants. Worked in executive positions with such organizations as Ebasco, Management Analysis Company and Tenera. In November 1990, he joined the U.S. Council for Energy Awareness as vice president of Technical Programs. (Marvin, Op-Ed: In Energy, Nuclear Leads Transition to Green Jobs, http://www.nei.org/keyissues/newnuclearplants/economicbenefitsofnewnuclearplants/in-energy-nuclear-leads-transition-to-green-jobs/)

There is tremendous potential for rebuilding the U.S. economy on green jobs, particularly as energy companies gear up to meet rising electricity demand. The nuclear energy industry already is creating tens of thousands of American green jobs in the first wave of this transition.¶ Nuclear energy is one of the few bright spots in the U.S. economy – expanding rather than contracting. That’s due to a growing consensus that any credible program to address climate change must include carbon-free technologies like nuclear energy.¶ Energy companies, mainly in the fast-growing Sun Belt, have filed federal permits to build up to 26 nuclear plants. Betting on an increased emphasis on carbon-free nuclear energy to meet future power needs in the United States and elsewhere, reactor designers and manufacturers are expanding engineering centers and manufacturing facilities as well as their payrolls.¶ Green job growth has already begun in North Carolina, Tennessee and Pennsylvania and will spread to Virginia and Louisiana in the coming months. In Lake Charles, La., the Shaw Group and Westinghouse will fabricate reactor modules at a 300-acre site that will employee 1,400 workers. In Newport News, Va., Northrop Grumman and AREVA are building a new facility to manufacture massive reactor vessels and stream generators.¶ These and other companies already have hired more than 9,000 employees and invested $4 billion in developing new nuclear manufacturing and business operations. The Shaw-Westinghouse facility alone will generate 2,900 jobs—an economic horn of plenty for local officials. In this case, Louisiana Gov. Bobby Jindal said “we know that we have to invest more in alternative domestic energy sources like wind, ethanol, solar and nuclear energy. This announcement does not only represent new jobs and a new, vibrant economic engine in our state, but also shows that Louisiana is harnessing the future of the energy industry and the most innovative thinking of the next generation.”¶ Tim Kaine said his state has “unique attributes” to position it as a leader in nuclear energy. After the Newport News project was announced last October, the local newspaper focused on the single most important fact for local workers: Northrop Grumman + AREVA = 540 good jobs for Newport News. ¶ Engineering and manufacturing jobs are green jobs in today’s market and foretell the significant potential in the energy sector for stimulating the U.S. economy. ¶ The U.S. electricity industry faces an unprecedented challenge. It must invest up to $2 trillion in new power generation and distribution technology to meet an expected 25 percent increase in demand by 2030. And it must do so assuming that there will be a price on carbon, currently a byproduct of 70 percent of the nation’s electricity production capability. Of the emission-free sources, nuclear energy dominates today and has the most potential for large-scale expansion. ¶ Nuclear energy must play an important role in helping America succeed in this challenge. Expanding nuclear power will help reduce the threat of global warming, meet the rising demand for electricity and stimulate the U.S. economy. ¶ ¶ Building a new generation of nuclear plants will create tens of thousands of dependable, good-paying jobs for American workers. Whether building new carbon-free nuclear power plants or a “smart” grid that will help use electricity more wisely, nuclear energy jobs are as green as any other low or non-carbon source of electricity.¶ A single nuclear plant will create 1,400 to 1,800 jobs during construction and 400 to 700 employees during the 60-year operating lifetime of the plant. Based on economic studies of 22 U.S. nuclear power plants, each year a new reactor will produce $430 million in local expenditures for goods, services and labor; generate more than $20 million in state and local tax revenue; and produce at least $75 million in federal tax payments. Construction of a new reactor also will provide a substantial boost to suppliers of commodities and manufacturers of hundreds of components.¶ An abundant supply of electricity is critical to preserving and advancing our quality of life, standard of living and national security. Affordable, reliable electricity is vital for America’s long-term economic success, but building all new sources of electricity is capital intensive. The pace of new nuclear plant development, and of job creation in this sector of the economy, is largely dictated by the financing support available from the federal government///

– particularly in today’s tight credit markets. ¶ Limited financial stimulus for wind, solar and advanced nuclear plants is appropriate to jumpstart this economic shift. For example, the federal loan guarantee program passed by Congress for carbon-free energy sources will lower the cost of building new electricity supplies that will in turn keep consumer costs down. Best of all, it doesn’t use U.S. taxpayer money. Those companies that will pursue loan guarantees also will pay the fees associated with implementing the program. ¶ However, $18.5 billion in loan guarantee volume approved by Congress in 2005 was swamped by applications from 17 companies seeking a total of $122 billion in loan guarantees for new nuclear plant projects. The loan guarantee program alone doesn’t address the real need for $2 trillion in financing for the electricity sector over the next 15 years. ¶ The economic and energy challenges facing our nation are daunting. We must have a national energy policy that develops carbon-free technologies, drives innovation to supply reliable electricity and creates jobs to help stimulate the U.S. economy. Nuclear energy is a vital part of the solution to these goals—producing 73 percent of all carbon-free electricity while creating tens of thousands of stable, high-paying jobs as part of a transition to a greener economy.

## \*\*\* 1AR

### Case

#### Their evidence is wrong.

**Barton 10** (Charles, frmr PhD Candidate in History, MA in Philsophy, worked on the LFTR concept for about 2/3eds of his ORNL career and recognized by nuclear bloggers most of whom have technical training, and has been mentioned by the Wall Street Journal, “Arjun Makhijani and the Modular Small Reactor null-hypothesis” October 2, 2010, http://nucleargreen.blogspot.com/2010/10/arjun-makhijani-and-modular-small.html)

Arjun Makhijani (with Michele Boyd) has recently published a fact sheet on Small Modular Reactors which in effect advertises itself as the null-hypothesis to the case I an others have been making for some time on the advantages of small reactors. Small Modular ReactorsNo Solution for the Cost, Safety, and Waste Problems of Nuclear Power, Makhijani's title proclaims. But what is the evidence that backs Makhijani's case up. As it turns out Makhijani offers no empirical data to back up his assertion, so as an example of scientific reasoning, Makhijani's fact sheet rates an F.

#### It is difficult to implement and too expensive.

**Hansen, 9** (James, Best known for bringing global warming to the world’s attention in the 1980s, when he first testified before Congress. An adjunct professor in the Department of Earth and Environmental Sciences at Columbia University and at Columbia’s Earth Institute, and director of the NASA Goddard Institute for Space Studies, he is frequently called to testify before Congress on climate issues, Storms of My Grandchildren, Published by Bloomsbury, Pg. 231)

This geo-engineering comment requires one more digression, to answer the inevitable question: Why not use such a geo-engineering trick to solve our present global warming problem, thus avoiding the need to draw down carbon dioxide to less than 350 parts per million? There are several reasons. First, carbon dioxide must be **less than 350 ppm** to avoid ocean acidification problems. Second, sun shielding at present is far more **expensive** and **difficult to implement** than rational alternatives such as energy efficiency, renewable energy, and nuclear power. Third, it is generally a bad idea to try to cover up one pollution effect by introducing another; such an approach is likely to have many unintended effects. It is hard to **match nature**. Better to keep atmospheric composition and solar irradiance at the levels to which humanity and nature are adapted. The purpose of sun shielding in the very distant future would be to keep solar irradiance at the level to which life is adapted.

#### Super vulnerable.

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

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

### 1AR Thumpers

#### Thumpers abound – GOP infighting, budget, high expectations

**GUARDIAN 1 – 6 – 13** [Barack Obama readies for host of reforms on Washington return, <http://www.guardian.co.uk/world/2013/jan/06/barack-obama-second-term-reforms>]

Barack Obama has returned to Washington intent on pushing through a host of reforms in his second term, with a focus on immigration and gun control.

The president will set out his plans when he delivers his inaugural speech on 21 January, although his momentum could be stymied by another economic showdown as early as late February.

The biggest obstacle facing Obama is the Republican caucus in the House being at war with itself, divided between moderates and Tea Party sympathisers, and this has a knock-on effect in terms of working with Democrats in Congress and the White House.

Before leaving Washington to resume his interrupted holiday in Hawaii, Obama warned that time-consuming battles with Congress would prevent the US securing the kind of legislation it needs.

"We can settle this debate, or at the very least, not allow it to be so all-consuming all the time that it stops us from meeting a host of other challenges that we face – creating jobs, boosting incomes, fixing our infrastructure, fixing our immigration system, protecting our planet from the harmful effects of climate change, boosting domestic energy production, protecting our kids from the horrors of gun violence," he said.

He begins his second term with the economy in much better shape than when he took office in January 2009, with US involvement in the war in Iraq over and the one in Afghanistan winding down.

But political analysts caution that second terms often begin with high expectations, with presidents re-energised by winning an election, but end in disappointment. Bill Clinton's second term was dominated by the Monica Lewinsky affair and George W Bush quickly became a lame duck after Hurricane Katrina.

Norman Ornstein, a widely respected analyst at Washington's American Enterprise Institute, cautioned that second terms were usually less productive than first terms. Ornstein identified potential problems as "the continuing hold on the GOP [Grand Old Party] by the radical right, and the continuing dysfunction in our politics", and also the high expectations among the Democratic base.

**Hagel fight coming Monday**

**LA TIMES 1 – 4 – 13** Obama expected to nominate Chuck Hagel as secretary of Defense, <http://www.latimes.com/news/politics/la-pn-obama-to-nominate-chuck-hagel-secretary-defense-20130104,0,6113862.story>

President Obama is expected to nominate Chuck Hagel, a former Republican senator and Vietnam veteran, to be secretary of Defense, officials said, setting up a confirmation battle with lawmakers and interest groups critical of his views on Israel and Iran.

White House officials said Friday afternoon that the president hadn’t formally offered the job to Hagel, but others familiar with the process said that the announcement could come as soon as Monday

By nominating a Republican to run the Defene Department, Obama gives his second-term national security team a bipartisan cast at a time when the White House is rapidly winding down the war in Afghanistan and planning for even deeper cuts in the defense budget.

But the choice also sets the stage for a possibly difficult confirmation fight over Hagel with Israel’s defenders in Washington, some of whom mounted a public campaign to head off his nomination in recent weeks, criticizing Hagel for his past comments calling on Israel to negotiate with Palestinians and for his opposition to some sanctions aimed at Iran.

Hagel, who would replace Leon E. Panetta as Defense secretary, has also been criticized by liberal Democrats and gay rights organizations for calling a Clinton administration ambassadorial nominee “openly, aggressively gay” — a comment Hagel recently apologized for.

### 1AR—Winners Win

#### Uniquely true for Obama.

**Green 10** [David Michael, Professor of political science at Hofstra University, *The Do-Nothing 44th President*, June 12th, http://www.opednews.com/articles/The-Do-Nothing-44th-Presid-by-David-Michael-Gree-100611-648.html]

Yet, on the other hand, Bush and Cheney had far less than nothing to sell when it came to the Iraq war - indeed, they had nothing but lies - and their team handled that masterfully. The **fundamental characteristic** of the Obama presidency is that the president is a reactive object, essentially the victim of events and other political forces, rather than the single greatest center of power in the country, and arguably on the planet. He is the Mr. Bill of politicians. People sometimes excuse the Obama torpor by making reference to all the problems on his plate, and all the enemies at his gate. But what they fail to understand - and, most crucially, what he fails to understand - is the nature of the modern presidency. Successful presidents today (by which I mean those who get what they want) not only drive outcomes in their preferred direction, but shape the very character of the debate itself. And they not only shape the character of the debate, but they determine which items are on the docket. Moreover, there is a continuously evolving and **reciprocal relationship** between presidential boldness and achievement. In the same way that **nothing** breeds success like success, nothing sets the president up for achieving his or her next goal better than succeeding dramatically on the last go around. This is absolutely a matter of perception, and you can see it best in the way that Congress and especially the Washington press corps fawn over bold and intimidating presidents like Reagan and George W. Bush. The political teams surrounding these presidents understood the psychology of power all too well. They knew that by simultaneously creating a **steamroller effect** and feigning a **clubby atmosphere** for Congress and the press, they could leave such hapless hangers-on with only one remaining way to pretend to preserve their dignities. By **jumping on board** the freight train, they could be given the illusion of being next to power, of being part of the **winning team**. And so, with virtually the sole exception of the now retired Helen Thomas, this is precisely what they did. But the game of successfully governing is substantive as well as psychological. More often than not, timidity turns out not to yield the safe course anticipated by those with weak knees, but rather their **subsequent undoing**. The three cases mentioned at the top of this essay are paradigmatic.

#### The link turn outweighs the link.

**Gergen 2k** [David, American political consultant and former presidential advisor who served during the administrations of Nixon, Ford, Reagan, and Clinton, Director of the Center for Public Leadership and a professor of public service at Harvard Kennedy School, Editor-at-large for U.S. News and World Report, Senior Political Analyst for CNN, *Eyewitness to Power*, p. 285]

As Richard Neustadt has pointed out, power can beget power in the presidency. A chief executive who exercises leadership well in a hard fight will see his reputation and strength grow for future struggles. **Nothing** gives a president **more political capital** than a strong, bipartisan victory in Congress. That's the magic of leadership. Clinton, after passage of his budget and NAFTA, was at the height of his power as president. Sadly, he couldn't hold.

#### Capital will atrophy if its not spent.

**Mitchell 9** [Lincon, Assistant Professor of International Law @ Columbia University, July 18th, *Time for Obama to Start Spending Political Capital*, http://www.huffingtonpost.com/lincoln-mitchell/time-for-obama-to-start-s\_b\_217235.html]

Political capital is not, however, like money, it **cannot be saved** up interminably while its owner waits for the right moment to spend it. Political capital has a **shelf life**, and often not a very long one. If it is not used relatively quickly, it dissipates and **becomes useless** to its owner. This is the moment in which Obama, who has spent the first few months of his presidency diligently accumulating political capital, now finds himself. The next few months will be a key time for Obama. If Obama does not spend this political capital during the next months, it will likely be **gone** by the New Year anyway. Much of what President Obama has done in his first six months or so in office has been designed to build political capital, interestingly he has sought to build this capital from both domestic and foreign sources. He has done this by traveling extensively, reintroducing to America to foreign audiences and by a governance style that has very cleverly succeeded in pushing his political opponents to the fringes. This tactic was displayed during the effort to pass the stimulus package as Republican opposition was relegated to a loud and annoying, but largely irrelevant, distraction. Building political capital was, or should have been, a major goal of Obama's recent speech in Cairo as well. Significantly, Obama has yet to spend any of his political capital by meaningfully taking on any powerful interests. He declined to take Wall Street on regarding the financial crisis, has prepared to, but not yet fully, challenged the power of the AMA or the insurance companies, nor has he really confronted any important Democratic Party groups such as organized labor. This strategy, however, will not be fruitful for much longer. There are now some very clear issues where Obama should be spending political capital. The most obvious of these is health care. The battle for health care reform will be a major defining issue, not just for the Obama presidency, but for American society over the next decades. It is imperative that Obama push for the best and most comprehensive health care reform possible. This will likely mean not just a bruising **legislative battle**, but one that will pit powerful interests, not just angry Republican ideologues, against the President. The legislative struggle will also pull many Democrats between the President and powerful interest groups. Obama must make it clear that there will be an enormous political cost which Democrats who vote against the bill will have to pay. Before any bill is voted upon, however, is perhaps an even more critical time as pressure from insurance groups, business groups and doctors organizations will be brought to bear both on congress, but also on the administration as it works with congress to craft the legislation. This is not the time when the administration must focus on making friends and being liked, but on standing their ground and getting a strong and inclusive health care reform bill. Obama will have to take a similar approach to any other major domestic legislation as well. This is, of course, the way the presidency has worked for decades. Obama is in an unusual situation because a similar dynamic is at work at the international level. A major part of Obama's first six months in office have involved pursuing a foreign policy that implicitly has sought to rebuild both the image of the US abroad, but also American political capital. It is less clear how Obama can use this capital, but now is the time to use it. A cynical interpretation of the choice facing Obama is that he can remain popular or he can have legislative and other policy accomplishments, but this interpretation would be wrong. By early 2010, Obama, and his party will, fairly or not, be increasingly judged by what they have accomplished in office, not by how deftly they have handled political challenges. Therefore, the only way he can remain popular and get new political capital is through converting his current political capital into concrete legislative **accomplishments**. Health care will be the first and very likely most important, test.

#### Obstructionism makes capital irrelevant without a winning reputation.

**Kuttner 10** [Robert, Distinguished Senior Fellow of the Think Tank Demos, Co-founder and Co-editor of The American Prospect, Business Week columnist, Author of Obama’s Challenge, *Game changer*, http://www.prospect.org/cs/articles?article=game\_changer]

The dysfunction of American democracy has become a standard bit of conventional wisdom. It's certainly true that a bias against government action is baked into our constitutional cake, with its checks, balances, and multiple veto points. It's also true that conservative obstructionism has reached a new peak in recent years. The prime source of today's extreme dysfunction is less the republic than the Republican Party. A number of smart commentators, from E.J. Dionne to John Podesta, have aptly observed that we now have a semi-parliamentary system, in which the opposition party can block but the governing party can't govern. And despite Barack Obama's best efforts to pursue common ground, the Republicans have cynically concluded that rendering the Democrats ineffectual is preferable to coming together to solve national problems. It has always been difficult in America for the governing party to govern. Only twice in the past century -- the New Deal era between 1933 and 1938 and the 89th Congress of Lyndon B. Johnson's Great Society -- did progressive Dem-ocrats have a large enough margin in Congress coupled with real presidential leadership to enact major reforms. The particulars were different then, with moderate and liberal Republicans roughly offset by racist Dixiecrats. The filibuster was reserved for special (racial) occasions. But the general problem would be familiar to today's critics of democratic dysfunction. James MacGregor Burns' classic, The Deadlock of Democracy, was written nearly half a century ago. What makes the difference, then as now, is the presence or absence of **presidential leadership**. It takes the power of a president to define national problems, mobilize public opinion, create a new progressive political center, move Congress to act, and hose away obstructionists. That's what Franklin D. Roosevelt had to do to win the New Deal, and what Johnson did to prevail on civil rights. Though John F. Kennedy, Jimmy Carter, and Bill Clinton during his first two years actually had slightly larger majorities in Congress than Obama does today, all had difficulty enacting their programs. None possessed the kind of leadership gifts that FDR and LBJ had. Despite his exceptional potential, Obama dismayed his progressive base in his first year in office by clinging to an illusion of bipartisanship long after Republicans made clear that their only goal was to destroy him. But since early March, something potentially transformative has happened. The seeker of common ground has metamorphosed into a fighting partisan. Faced with the prospect of a humiliating, defining defeat on health reform, Obama has begun exercising the kind of leadership that his admirers discerned during the campaign. Things that were seemingly impossible have suddenly be-come necessary to avert a rout. Passing legislation in the Senate by simple majority, despite Republican whining, is now thinkable. So is passing legislation in the House with Democrats only. Despite warnings by the likes of Senate Republican Leader Mitch McConnell that a vote in favor of the bill would mean retribution by the voters, it has dawned on skeptical Democratic legislators that whatever the measure's deficiencies, going before the voters in November as the can-do party is preferable to facing re- election as the ineffectual one. In our uniquely structured hobbled democracy, with its bias against action, presidential leadership has always been the **game changer**. The search for common ground with the Republicans is one brand of leadership, but it turns out to be the **wrong one** today. Progressives who dislike aspects of this bill should nonetheless be hoping that Obama's strategic shift has not come too late. With Democrats at last willing to govern by majority rule and Obama now willing to confront both Republican and industry obstructionism, the deficient features of the bill can more easily be changed. More important, his leadership will make him a more compelling president. If Obama does emerge as both an effective partisan and a progressive who delivers, the pundits' morning line will **change overnight**. The president will be depicted as a **giant-killer**. That can only be good both for his general public approval and for his support among Democrats. The party base, which has been in agony about Obama's dithering, will be newly **energized**. The nation still faces a crisis too severe to indulge the luxury of obstructionism. For now, Democrats should be willing to use reconciliation as necessary. Next January, Senate Democrats should scrap the filibuster rule once and for all. And if his near-death experience on health care has finally ended his **futile quest** for a bipartisan consensus, Obama will be in a better position to deliver on other fronts. Let's hope that we are seeing a real turning point in his presidency.