#### Advantage 1 is islanding current DOD efforts at getting off the grid fail because of lack of coordination.

GAO ‘09

(Government Accountability Office, “Defense Critical Infrastructure:” <http://www.gao.gov/assets/300/297169.html>, SEH)

**DOD's** most critical assets are vulnerable to disruptions in electrical ¶ power supplies, but DOD lacks sufficient information to determine the ¶ full extent of the risks and vulnerabilities these assets face. **All** 34 ¶ **of these most critical assets require electricity continuously to** ¶ **support their military missions**, and 31 of them rely on commercial ¶ power grids--which the Defense Science Board Task Force on DOD Energy ¶ Strategy has characterized as increasingly fragile and vulnerable--as ¶ their primary source of electricity. DOD Instruction 3020.45 requires ¶ DOD to conduct vulnerability assessments on all its most critical ¶ assets at least once every 3 years. Also, ASD(HD&ASA) has requested the ¶ U.S. Army Corps of Engineers--which serves as the Defense Critical ¶ Infrastructure Program's Defense Infrastructure Sector Lead Agent for ¶ Public Works--to conduct preliminary technical analyses of DOD ¶ installation infrastructure (including electrical power infrastructure) ¶ to support the teams conducting Defense Critical Infrastructure Program ¶ vulnerability assessments on the most critical assets. ¶ \* As of June 2009, and according to ASD(HD&ASA) and the Joint Staff, ¶ DOD had conducted Defense Critical Infrastructure Program vulnerability ¶ assessments on 14 of the 34 most critical assets.[Footnote 18] **DOD has** ¶ **not conducted the remaining assessments** because it did not identify the ¶ most critical assets until October 2008. To comply with the ¶ instruction, DOD would have to complete Defense Critical Infrastructure ¶ Program vulnerability assessments on all most critical assets by ¶ October 2011. ¶ \* **DOD has neither conducted, nor developed additional guidelines and** ¶ **time frames for conducting, these vulnerability assessments on any of** ¶ **the five non-DOD-owned most critical assets located in the United** ¶ **States or foreign countries,** citing security concerns and political ¶ sensitivities. ¶ \* **The U.S. Army Corps of Engineers has not completed the preliminary** ¶ **technical analyses requested because it has not yet received** ¶ **infrastructure-related information regarding the networks, assets,** ¶ **points of service, and inter-and intradependencies related to** ¶ **electrical power systems that it requires from the military services.** ¶ \* **Although DOD is in the process of developing guidelines, it does not** ¶ **systematically coordinate Defense Critical Infrastructure Program** ¶ **vulnerability assessment processes and guidelines with those of other,** ¶ **complementary DOD mission assurance programs--including force** ¶ **protection; antiterrorism; information assurance; continuity of** ¶ **operations; chemical, biological, radiological, nuclear, and high-** ¶ **explosive defense; readiness; and installation preparedness**--that also ¶ examine electrical power vulnerabilities of the most critical assets, ¶ because DOD has not established specific guidelines for such systematic ¶ coordination. ¶ \* The 10 Defense Critical Infrastructure Program vulnerability ¶ assessments we reviewed did not explicitly consider assets' ¶ vulnerabilities to longer-term (i.e., of up to several weeks' duration) ¶ electrical power disruptions[Footnote 19] on a mission-specific basis, ¶ as DOD has not developed explicit Defense Critical Infrastructure ¶ Program benchmarks for assessing electrical power vulnerabilities ¶ associated with longer-term electrical power disruptions. ¶ With more comprehensive knowledge of the most critical assets' risks ¶ and vulnerabilities to electrical power disruptions, DOD can better ¶ avoid compromising crucial DOD-wide missions during electrical power ¶ disruptions. This additional information may also improve DOD's ability ¶ to effectively prioritize funding needed to address identified risks ¶ and vulnerabilities of its most critical assets to electrical power ¶ disruptions. ¶ **While DOD has taken some steps toward assuring the availability of its** ¶ **electrical power supplies to its most critical assets, it lacks a** ¶ **mechanism for tracking the implementation of future Defense Critical** ¶ **Infrastructure Program risk management decisions and responses, and its** ¶ **coordination with local electricity providers has been limited**. From ¶ August 2005 through October 2008, DOD issued Defense Critical ¶ Infrastructure Program guidance for identifying critical assets, ¶ assessing their vulnerabilities, and making risk management decisions ¶ about those vulnerabilities. In addition, DOD has conducted various ¶ types of vulnerability assessments--including Defense Critical ¶ Infrastructure Program vulnerability assessments, Joint Staff ¶ Integrated Vulnerability Assessments, and other mission assurance- ¶ related assessments--on 24 of the most critical assets, including ¶ multiple assessments on some of the same assets. According to the ¶ survey, these Defense Critical Infrastructure Program and other DOD ¶ vulnerability assessments have identified various electrical power ¶ vulnerabilities for 10 of the assets. DOD has also coordinated with ¶ other federal agencies--including DHS, DOE, and the Federal Energy ¶ Regulatory Commission--and industry organizations in an effort intended ¶ to assure the availability of electrical power supplies to the most ¶ critical assets. **However, ASD(**HD&ASA)--which has responsibility for ¶ overseeing the implementation of actions for the remediation, ¶ mitigation, or acceptance of risks to DOD critical assets--**has not yet** ¶ **developed a mechanism to track the implementation of future Defense** ¶ **Critical Infrastructure Program risk management decisions, along with** ¶ **responses intended to address risks and vulnerabilities identified for** ¶ **the most critical assets. Without such information, DOD cannot** ¶ **comprehensively determine whether asset owners are taking the necessary** ¶ **steps to address identified risks and vulnerabilities of all of the** ¶ **most critical assets to electrical power disruptions**. In addition, ¶ Defense Critical Infrastructure Program guidance encourages ¶ coordination between DOD installations with critical assets and their ¶ respective public utilities, including electricity providers, in order ¶ to remediate risks involving those utilities--for example, by ¶ discussing potential changes in service agreements with those ¶ utilities. However, according to our survey results, such coordination ¶ with local electricity providers has occurred for only 7 of DOD's 34 ¶ most critical assets. As a result, DOD may not be taking advantage of ¶ available expertise on electrical power issues from such providers. ¶ **Without increased coordination between more DOD installations with** ¶ **critical assets and their respective local electricity providers, DOD** ¶ **potentially limits the risk mitigation or remediation options available** ¶ **to it for addressing the vulnerabilities of its most critical assets to** ¶ **electrical power disruptions.**

#### Grid failure guaranteed soon

Huff ‘12

(Ethan A, staff writer at natural news “Hacking expert says catastrophic failure of smart energy grid within 3 year” <http://usahitman.com/hcfseg/>, SEH)

For at least the past five years, the federal government has been pushing utility companies across America to “upgrade” their infrastructures to support “smart grid” technology that allows two-way communication with, and centralized control of, the energy grid through an internet-based network. But **cyber expert David Chalk says that a complete and catastrophic failure of the entire smart energy grid is definitely going to occur within the next three years**, and that few are aware of this.¶ Traditionally, the electric meters attached to structures, the wired and underground poles that deliver electricity to them, and the plants where electricity are generated have all been operated and maintained independently by field workers who gather data in a one-way system of communication. In other words, when a problem occurs with an electric meter or a pole in the traditional system, an expert has to go out and assess the problem, as there is no automated way for the system itself to send feedback.¶ For this reason and others, **many have hailed smart grid technology as the solution, and as the way to bring the electric grid into the 21st century. But according to Chalk and many other experts in the field, smart grid technology is highly vulnerable to cyber attacks, and the technology is so digitally centralized that hackers are sure to “crack the code,” so to speak, and eventually bring down the system.**¶“We’re in a state of crisis,” says Chalk. “**The front door is open and there is no lock to be had. There is not a power meter or device on the grid that is protected from hacking** — if not already infected — with some sort of trojan horse that can cause the grid to be shut down or completely annihilated.”¶ **Solar storms, digital warfare threaten to bring down the smart grid**¶ **Smart grid technology is also vulnerable to failure from solar storms and digital warfare, both of which could quickly take down the entire system in an instant, leaving millions, and potentially billions, of people in the dark without power**. Smart grid technology also comes with its own unique health and privacy risks that are being ignored by its proponents as well.¶ “**Unless we wake up and realize what we’re doing, there is 100 percent certainty of total catastrophic failure of the entire power infrastructure within three years**,” adds Chalk. “**This could actually be worse than a nuclear war, because it would happen everywhere.** How governments and utilities are blindly merging the power grid with the Internet, and effectively without any protection, is insanity at its finest.”

#### Grid will go down- four reasons

Defense Science Board ‘08

(The DSB is a Federal ¶ Advisory Committee established to provide independent advice to the Secretary of ¶ Defense, “More Fight – Less Fuel” <http://www.acq.osd.mil/dsb/reports/ADA477619.pdf>, SEH)

5.3 Four Sources of Risk for Grid Outages ¶ The first risk is from overload. As wires become overloaded, they heat up and sag, ¶ making them vulnerable to entanglement with trees and other objects. This happened ¶ near Cleveland, Ohio on August 14, 2003. According to the U.S.-Canada Power ¶ System Outage Task Force, high demand caused a high-voltage line to come in contact ¶ with overgrown trees. The resulting cascade of failures plunged many of the 50 million ¶ people in the Northeast U.S. and Canada living in an area covering 9,300 square miles ¶ into darkness. It shut down more than 500 generating units at 265 power plants, ¶ including 22 nuclear plants.¶ 29¶ ¶ A second risk comes from natural disasters, such as hurricanes, tornadoes, electrical ¶ storms or other extreme weather events. The consequences could be very much as ¶ described above, but with the added risk of physical damage to the infrastructure. ¶ Favorable commentary about the performance of the grid following the August 2003 ¶ outage focused on the fact that restoration occurred fairly quickly. Within a few days ¶ power was restored virtually everywhere, with much of the area back up within a few ¶ hours. This was largely because safety features built into the grid successfully ¶ prevented damage to critical equipment such as generators, breakers and ¶ transformers.¶ 30¶ However, the Task Force is concerned that such an extensive outage could be caused by such a commonplace event – a single line contacting a tree. This ¶ inevitably raises the next issue below: what the result might have been had there been ¶ physical damage to infrastructure, such as from a deliberate attack by knowledgeable ¶ adversaries? ¶ A third risk comes from sabotage or terrorist activity, whether local, trans-national, or ¶ state-sponsored, and including both conventional and nuclear attack. Nuclear attack ¶ could take place either directly or through the generation of a high altitude ¶ electromagnetic pulse (EMP). The grid is a relatively easy target for a terrorist. It is ¶ brittle, increasingly centralized, capacity-strained, and largely unprotected from physical ¶ attack, with little stockpiling of critical hardware. Although the system is designed to ¶ survive single points of failure, increasing demand on the system and increasing ¶ network constraints make multiple points of failure more likely. These are difficult to ¶ anticipate and more likely to result in cascading outages and catastrophic outages that ¶ cover large areas for long periods of time. Network Single Points of Failure (NSPF) are ¶ abundant. High voltage transformers, breakers, and other long-lead time items are ¶ particularly critical system elements.¶ 31¶ They can be easily targeted and destroyed. Grid ¶ sections could be taken down for months even if replacement transformers and ¶ breakers could be found; or for years if certain components need to be newly ¶ manufactured and transported. There are only limited backups located around the ¶ country—generally co-located with operating equipment. For some of the largest ¶ equipment, there is no domestic supply and only limited overseas production capacity ¶ which is fully booked years ahead.¶ 32¶ For example, 765 kV transformers are ¶ manufactured only by one company in Canada. Armed with the right knowledge, a ¶ small number of people could shut down electricity over significant areas for an ¶ extended period of time, including power to critical DoD missions. The grid is not ¶ designed to withstand a coordinated multi-pronged or wide-area attack.¶ 33¶ The Task ¶ Force noted that attacks on the grid are one of the most common and effective tactics of ¶ insurgents in Iraq, and are increasingly seen in Afghanistan.¶ 34¶ In addition to physical attacks on the grid, there is the potential for cyber attacks. U.S. ¶ grid control systems are continuously probed electronically, and there have been ¶ numerous attempted attacks on the Supervisory Control and Data Acquisition (SCADA) ¶ systems that operate the grid. None have yet resulted in major problems in the U.S., ¶ but the potential exists for major outages in the same way successful hackers can ¶ disrupt computer networks.¶ 35¶ Further details regarding the potential for deliberate attacks to the grid and their potential consequences are contained in a classified annex ¶ to this report. ¶ A fourth risk comes from interruptions in supplies to generating plants, which can be ¶ caused by natural events, infrastructure failures, attack or even market forces. This ¶ occurred in California during 2000 and 2001 when supplies of natural gas were ¶ interrupted and forced a reduction in electricity generation.¶ 36¶ Approximately 20% of ¶ U.S. electricity is generated by natural gas and market prices have swung wildly over ¶ the past several years.¶ 37¶ Approximately 52% of U.S. electricity is generated by coal and ¶ transportation routes that move coal from mines to generating plants are sometimes ¶ remote and lacking in alternatives. Critical rail lines or bridges could be taken out by ¶ determined saboteurs. For example, in May 2005, 43 rail cars came off the tracks. The ¶ disruption to coal deliveries caused prices to spike, and raised electricity prices by 6% ¶ nationally, according to the Bureau of Labor Statistics. The 100 mile length of rail line ¶ through Wyoming that carries the output of the Western coal belt to power plants is the ¶ most heavily traveled in the nation.¶ 38¶ So in addition to risks from grid outage, there are ¶ risks to the supply chain that enables the grid to work—not least from electricity supply ¶ failures themselves, which could disable the pipelines and controls used by other forms ¶ of energy, notably oil and gas.

#### Scenario 1 is Bioterror.

#### Grid outage risks terrorism - takes out surveillance

Defense Science Board ‘08

(The DSB is a Federal ¶ Advisory Committee established to provide independent advice to the Secretary of ¶ Defense, “More Fight – Less Fuel” <http://www.acq.osd.mil/dsb/reports/ADA477619.pdf>, SEH)

**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.** About 85% of the energy infrastructure upon which DoD ¶ depends is commercially owned, **and 99% of the electrical energy DoD installations** ¶ **consume originates outside the fence.**¶ 3¶ As noted below, however, the grid 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. ¶ 2.3.1 State of the Grid ¶ The U.S.-Canadian electric grid is very efficient and cost effective but its design metric ¶ is efficiency more than resiliency. As a consequence, it is vulnerable to natural disaster or deliberate attack. The Task Force received several briefings from the Mission ¶ Assurance Division at Dahlgren (MAD), the Department of Energy and the utility ¶ industry. Based on these briefings, the Task Force is concerned about the condition of ¶ the grid and the ability to effect timely repairs. ¶ This concern extends not only to the complete dependency of critical national security ¶ missions on the grid, but also to its centrality to all facets of the nation’s economic life. ¶ To appreciate the seriousness of the impacts of an extended disruption, consider the ¶ 2003 Northeast blackout. At around 4:15pm EST on August 14, 2003 about 50 million ¶ people living in a 9,300 square mile area in the U.S. and Canada lost electrical power. ¶ More than 500 generating units at 265 power plants shut down during the outage, 22 of ¶ which were nuclear. Those plants took about two weeks to regain full capacity, and lost ¶ an average of more than half their capacity for 12 days. The shutdown was in part ¶ precautionary in nature. If an imbalance between load and supply occurs, power lines ¶ grow longer and sag from overheating and other hardware can fail. These imbalances ¶ can damage equipment that is hard-to-repair, requires long lead time to produce and is ¶ expensive. So, the grid quickly disconnects itself when a threatening imbalance is ¶ detected. Nuclear plants are required for safety reasons to shut down when the grid ¶ they’re connected to is de-energized.¶ 4¶ A U.S.-Canada Task Force found the main cause of the blackout to be the failure of a ¶ utility in Ohio to properly trim trees near a power line, causing the first in what became a ¶ set of cascading failures.¶ 5¶ Secretary of Energy Spencer Abraham said there would be ¶ no punishment for the utility because current U.S. law does not require electric reliability ¶ standards. However, the Energy Policy Act of 2005 (EPAct 2005) gave the Federal ¶ Energy Regulatory Commission (FERC) new authority to direct the industry to develop ¶ reliability standards. It directs FERC to designate an Electric Reliability Organization ¶ (ERO) to develop and propose reliability standards, which only after agreement by the ¶ industry become mandatory. The ERO chosen by the FERC is a volunteer, industry run ¶ organization. While FERC oversight of industry developed standards is an ¶ improvement over the previous situation, the Task Force remains concerned that FERC ¶ may be unable to reduce the risk to critical DoD missions to acceptable levels in a ¶ reasonable timeframe. ¶ **Some have argued that the August 2003 incident shows that the protections built into** ¶ **the grid worked. Within several hours electricity was restored to many areas, though a** ¶ **few areas waited nearly a week. However, the incident highlights how easily the power** ¶ **grid could be taken down. Also, quick restoration was possible because no significant** ¶ **equipment was damaged, something that might not occur in future incidents**. **Further,** ¶ **during the blackout most systems failed that would detect unauthorized border** ¶ **crossings, port landings, or unauthorized access to vulnerable sites. Future such blackouts could be exploited for terrorist activity, with potentially far more catastrophic** ¶ **results**. ¶ These risks exist elsewhere than in the U.S. For example, on September 28, 2003 Italy ¶ experienced the largest of a series of blackouts suffered through that year, affecting a ¶ total of 56 million people, and spilling into Switzerland.¶ 6¶ It was also the most serious ¶ blackout in Italy in 20 years. DoD installations located outside the continental United ¶ States (OCONUS) are dependent on the commercial grids serving their locations. ¶ Security of their power supplies and continuation of their missions is as important as ¶ within the U.S.

#### Surveillance key to stop bioterror – Characterize and effective response

National Strategy for Biosurveillance ‘12
(National Strategy for Biosurveillance, July 31, 2012 Accessed online August 24, 2012 at http://www.whitehouse.gov/sites/default/files/National\_Strategy\_for\_Biosurveillance\_July\_2012.pdf)

A well-integrated, national biosurveillance enterprise is a national security imperative . Our ability to ¶ detect quickly and characterize a potential incident of national significance that affects human, animal, ¶ or plant health is of paramount importance . Rapid detection and enhanced situational awareness are ¶ critical to saving lives and improving incident outcomes, whether the result of a bioterror attack or other ¶ weapons of mass destruction (WMD) threat, an emerging infectious disease, pandemic, environmental ¶ disaster, or a food-borne illness . Beyond our need to protect domestic interests, and because health ¶ threats transcend national borders, the United States also plays a vital role within an international ¶ network of biosurveillance centers across the globe.

#### Terrorists can obtain Bio-weapons and will use them – Syria Demise

Blair ‘12

(Charles P. Blair joined FAS in June 2010. He is the Senior Fellow on State and Non-State Threats. Born and raised in Los Alamos, New Mexico, Mr. Blair was an exchange student in Moscow in the mid-1980s, witnessing firsthand the closing salvos of the Cold War. Since the end of that era, Mr. Blair has worked on issues relating to the diffusion and diversification of weapons of mass destruction (WMD) in the context of proliferation amid the rise of mass casualty terrorism incidents and the centripetal and centrifugal elements of globalization. Mr. Blair’s work focuses on state and violent non-state actors (VNSA) – amid a dystopic and increasingly tribal world. “Fearful of a nuclear Iran? The real WMD nightmare is Syria” 1 MARCH 2012 accessed online August 22, 2012 at http://www.thebulletin.org/web-edition/op-eds/fearful-of-nuclear-iran-the-real-wmd-nightmare-syria)

As possible military action against Iran's suspected nuclear weapons program looms large in the public arena, far more international concern should be directed toward Syria and its weapons of mass destruction. When the Syrian uprising began more than a year ago, few predicted the regime of President Bashar al-Assad would ever teeter toward collapse. Now, though, the demise of Damascus's current leadership appears inevitable, and Syria's revolution will likely be an unpredictable, protracted, and grim affair. Some see similarities with Libya's civil war, during which persistent fears revolved around terrorist seizure of Libyan chemical weapons, or the Qaddafi regime's use of them against insurgents. Those fears turned out to be unfounded.¶ But the Libyan chemical stockpile consisted of several tons of aging mustard gas leaking from a half-dozen canisters that would have been impossible to utilize as weapons. Syria likely has one of the largest and most sophisticated chemical weapon programs in the world. Moreover, Syria may also possess an offensive biological weapons capability that Libya did not.¶ While it is uncertain whether the Syrian regime would consider using WMD against its domestic opponents, Syrian insurgents, unlike many of their Libyan counterparts, are increasingly sectarian and radicalized; indeed, many observers fear the uprising is being "hijacked" by jihadists. Terrorist groups active in the Syrian uprising have already demonstrated little compunction about the acquisition and use of WMD. In short, should Syria devolve into full-blown civil-war, the security of its WMD should be of profound concern, as sectarian insurgents and Islamist terrorist groups may stand poised to seize chemical and perhaps even biological weapons.¶ An enormous unconventional arsenal. Syria's chemical weapons stockpile is thought to be massive. One of only eight nations that is not a member of the Chemical Weapons Convention -- an arms control agreement that outlaws the production, possession, and use of chemical weapons -- Syria has a chemical arsenal that includes several hundred tons of blistering agents along with likely large stockpiles of deadly nerve agents, including VX, the most toxic of all chemical weapons. At least four large chemical weapon production facilities exist. Additionally, Syria likely stores its deadly chemical weapons at dozens of facilities throughout the fractious country. In contrast to Libya's unusable chemical stockpile, analysts emphasize that Syrian chemical agents are weaponized and deliverable. Insurgents and terrorists with past or present connections to the military might feasibly be able to effectively disseminate chemical agents over large populations. (The Global Security Newswire recently asserted that "[t]he Assad regime is thought to possess between 100 and 200 Scud missiles carrying warheads loaded with sarin nerve agent. The government is also believed to have several hundred tons of sarin agent and mustard gas stockpiled that could be used in air-dropped bombs and artillery shells, according to information compiled by the James Martin Center.")¶ Given its robust chemical weapons arsenal and its perceived need to deter Israel, Syria has long been suspected of having an active biological weapons program. Despite signing the Biological Weapons and Toxins Convention in 1972 (the treaty prohibits the development, production, and stockpiling of biological and toxin weapons), Syria never ratified the treaty. Some experts contend that any Syrian biological weapons program has not moved beyond the research and development phase. Still, Syria's biotechnical infrastructure undoubtedly has the capability to develop numerous biological weapon agents. After Israel destroyed a clandestine Syrian nuclear reactor in September 2007, Damascus may have accelerated its chemical and biological weapons programs.¶ It's hard to guard WMD when a government collapses. Although the United States and its allies are reportedly monitoring Syria's chemical weapons, recent history warns that securing them from theft or transfer is an extraordinary challenge. For example, during Operation Iraqi Freedom, more than 330 metric tons of military-grade high explosives vanished from Iraq's Al-Qaqaa military installation. Almost 200 tons of the most powerful of Iraq's high-explosives, HMX -- used by some states to detonate nuclear weapons -- was under International Atomic Energy Agency seal. Many tons of Al-Qaqaa's sealed HMX reportedly went missing in the early days of the war in Iraq. Forensic tests later revealed that some of these military-grade explosives were subsequently employed against US and coalition forces.¶ Even with a nationwide presence of 200,000 coalition troops, several other sensitive military sites were also looted, including Iraq's main nuclear complex, Tuwaitha. Should centralized authority crumble in Syria, it seems highly unlikely that the country's 50 chemical storage and manufacturing facilities -- and, possibly, biological weapon repositories -- can be secured. The US Defense Department recently estimated that it would take more than 75,000 US military personnel to guard Syria's chemical weapons. This is, of course, if they could arrive before any WMD were transferred or looted -- a highly unlikely prospect.¶ Complicating any efforts to secure Syria's WMD, post-Assad, are its porous borders. With Syria's government distracted by internal revolt and US forces now fully out of Iraq, it is plausible that stolen chemical or biological weapons could find their way across the Syrian border into Iraq. Similarly, Syrian WMD could be smuggled into southern Turkey, Jordan, Lebanon, the West Bank, Israel, and, potentially, the United States and Europe.¶ At least six formal terrorist organizations have long maintained personnel within Syria. Three of these groups -- Hamas, Hizbollah, and Palestinian Islamic Jihad -- have already attempted to acquire or use chemical or biological agents, or both. Perhaps more troubling, Al Qaeda-affiliated fighters from Iraq have streamed into Syria, acting, in part, on orders from Al Qaeda leader Ayman al-Zawahiri. In the past, Al Qaeda-in-Iraq fighters attempted to use chemical weapons, most notably attacks that sought to release large clouds of chlorine gas. The entry of Al Qaeda and other jihadist groups into the Syrian crisis underscores its increasingly sectarian manifestation. Nearly 40 percent of Syria's population consists of members of minority communities. Syria's ruling Alawite regime, a branch of Shia Islam, is considered heretical by many of Syria's majority Sunni Muslims -- even those who are not jihadists. Alawites, Druze, Kurds, and Christians could all become targets for WMD-armed Sunni jihadists. Similarly, Shiite radicals could conceivably employ WMD agents against Syria's Sunnis.¶ Religious fanaticism and WMD. Evidence of growing religious fanaticism is also reflected in recent Syrian suicide attacks. Since last December, at least five suicide attacks occurred in Syria. In the 40 years preceding, only two suicide attacks were recorded. Al Qaeda-linked mujahidin are believed to be responsible for all of these recent attacks. Civil wars are often the most violent and unpredictable manifestations of war. With expanding sectarian divisions, the use of seized WMD in Syria's uprising is plausible. To the extent that religious extremists believe that they are doing God's bidding, fundamentally any action they undertake is justified, no matter how abhorrent, since the "divine" ends are believed to legitimize PDF the means.¶ The situation in Syria is unprecedented. Never before has a WMD-armed country fallen into civil war. All states in the region stand poised to lose if these weapons find their way outside of Syria. The best possible outcome, in terms of controlling Syria's enormous WMD arsenal, would be for Assad to maintain power, but such an outcome seems increasingly implausible. And there is painfully little evidence that democratic forces are likely to take over in Syria. Even if they do eventually triumph, it will take months or years to consolidate control over the entire country.¶ If chaos ensues in Syria, the United States cannot go it alone in securing hundreds of tons of Syrian WMD. Regional leaders -- including some, such as Sunni Saudi Arabia and Shiite Iran, that are now backing the insurgency and the regime, respectively -- must come together and begin planning to avert a dispersion of Syrian chemical or biological weapons that would threaten everyone, of any political or religious persuasion, in the Middle East and around the world.

#### Bioterror sweeps the planet – psychological, economic impact and ease of spread

Lilliefors ‘12

(James Lilliefors is a longtime journalist and writer, Lilliefors has written frequently for the Washington Post, the Miami Herald, The Boston Globe and the Baltimore Sun. He started his journalism career as a writer and editor for Runner's World magazine and worked for many years as a newspaper editor and reporter, in Maryland and in Florida, winning a number of reporting awards. He also has extensively explored the issue of biological weapons research in his novel Viral. “Bio-weapons 40 years later: Are we any safer?” APRIL 10, 2012 accessed online August 25, 2012 at http://www.sohopress.com/bio-weapons-40-years-later-are-we-any-safer/442/)

As many as a dozen other nations have pursued or developed offensive biological weapons programs since the treaty came into effect, U.S. officials believe, including North Korea, China, Iran and Syria. But perhaps more troubling is the fact that it has become easier for potential terrorists to obtain biological weapons. As Secretary of State Hillary Clinton said at the Biological and Toxin Weapons Convention Review Conference in Geneva last December (the seventh such international conference since the treaty was signed): “Unfortunately, the ability of terrorists and other non-state actors to develop these weapons is growing.” So, too, apparently, is their desire to do so. In 2010, for instance, al-Qaeda in the Arabian Peninsula called for “brothers with degrees in microbiology or chemistry to develop a weapon of mass destruction.” The world community remains focused on potential nuclear threats—from Iran to North Korea to Pakistan—even though a biological attack could be just as devastating, and more unpredictable. This was the message that Ellen Tauscher, undersecretary of state for Arms Control and International Security, took to the 2009 annual meeting of the States Parties to the Biological Weapons Convention. Tauscher warned that “… a major biological weapons attack on one of the world’s major cities could cause as much death and economic and psychological damage as a nuclear attack.” Her comments came in conjunction with President Obama’s National Strategy for Countering Biological Threats, which set a platform for identifying and responding to possible bio-attacks. This new national strategy was clearly a step in the right direction, updating some of the objectives and principles of the 1972 treaty (which now has 165 signatories). But a more robust international dialogue on improving global health security—something akin to the nuclear threat dialogue—is still sorely needed. To understand how insidiously disruptive even a small-scale biological event could be, we need only look at the anthrax attacks of September and October 2001. Several letters containing anthrax spores were mailed anonymously to news organizations and two United States senators. Five people died as a result, 17 others were infected. Congress was paralyzed and the country was on high alert for weeks—although the heightened concern was mostly transitory. The federal investigation into the attacks went on for more than eight years without an arrest. The case was finally closed in 2010, a year and a half after the FBI’s major suspect, a government bio-defense researcher named Brice Ivins, killed himself.¶ The potential for an “anonymous” event is one of the most frightening aspects of the increasingly complex biological threat. As new diseases emerge, as the life sciences grow more sophisticated and as globalization draws everyone closer together, there are simply more ways that a deadly virus could get loose than there were even a few years ago. It is possible that a deadly pathogen could sweep the planet and we would never know for certain if it was naturally occurring, accidental, a terror attack or something deliberately let loose by a deranged scientist—which is what the FBI believes happened with the anthrax attacks of 2001. As President Obama said recently, “We must come together to prevent and detect and fight every kind of biological danger, whether it’s a pandemic like H1N1 or a terrorist threat or a terrible disease.”

#### Scenario 2 is Command and Control

#### Electrical grid most likely military attack

Merica 7/27

(Dan, CNN security blog, BA in Global Studies, “DoD official: Vulnerability of U.S. electrical grid is a dire concern” http://security.blogs.cnn.com/2012/07/27/dod-official-vulnerability-of-u-s-electrical-grid-is-a-dire-concern/

Speaking candidly at the Aspen Security Forum**, one defense department official expressed great concern about the possibility of a terrorist attack on the U.S. electric grid that would cause a “long term, large scale outage**.”¶ Paul Stockton, assistant secretary for Homeland Defense and Americas’ Security Affairs at the Department of Defense, **said such an attack would affect critical defense infrastructure at home and abroad** – a thought that Stockton said was keeping him up at night.¶ Also from Aspen: A failing grade for US readiness to deal with cyber attacks¶ “**The DOD depends on infrastructure in order to be able to operate abroad. And to make those operations function, we depend on the electric grid,”** Stockton said.¶ **The concern, Stockton continued, was that America’s adversaries would avoid attacking “the pointy end of the spear,”** meaning **combat troops,** **and would instead look for homeland**, possibly non-military, targets.¶ “**Our adversaries, state and non-state, are not stupid. They are clever and adaptive,” Stockton said. “There is a risk that they will adopt a profoundly asymmetric strategy, reach around and attack us here at home, the critical infrastructure that is not owned by the Department of Defense.”**

#### Grid outage takes out command and control undermines military risking nuclear war

The Examiner 7/27

(Robert Tilford, Graduate US Army Airborne School, Ft. Benning, Georgia, “Cyber attackers could shut down the electric grid for the entire east coast” <http://www.examiner.com/article/cyber-attackers-could-easily-shut-down-the-electric-grid-for-the-entire-east-coa>, SEH)

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

#### Absence of command signals causes satellite malfunction

Coleman, ‘10

(Kevin Coleman, Defense Tech Chief Cyber War Correspondent, Cyber War = Space War, March 1st, 2010, <http://defensetech.org/2010/03/01/cyber-war-space-war/#ixzz1948Fvj1r> )

While the satellite broadband market slowed in 2009 because of the poor economy, it still increased. The market continues to expand after U.S. regulators outlined the national broadband plan that allows satellite operators to use their radio spectrum for Internet traffic. That is why cyber security professionals are so concerned about the convergence of cyber space and space. Its becoming increasingly evident that any future war between modern militaries would be both a space war and a cyber war, in fact, they would be one and the same. Russia, China, and the U.S. have all stated they don’t want a space war, but are all preparing for one if one occurs. That sounds so familiar – oh wait a minute, didn’t Russia, China and the U.S. say the same thing about cyber war? Yes, they did. Satellites in geostationary orbits provide broadband connectivity to businesses and customers. Those satellites and their computer control ground stations present a viable target for offensive cyber actions. A hacker could disrupt or interfere with satellite control communications and could disrupt the delivery of broadband services. In the absence of such command signals, a satellite would malfunction. Worldwide attention focused on China’s successful anti-satellite missile test. While military officials question the scale and progress of the Chinese anti-satellite program, one has to wonder if China has already tested their anti-satellite cyber weapon. Military leaders are all too aware of the convergence of space and cyber space. An increasing percentage of military operations occur in cyber space and are integrated with and dependent on communication satellite systems in outer space.

#### Satellites key to heg

Martin ‘10

(Donald, Employee of the Aerospace Corporation, A History of US Military Satellite Communication Systems, Aerospace Corporation Magazine, <http://www.aero.org/publications/crosslink/winter2002/01.html>, )

U.S. military satellite communications have improved and expanded greatly over the past four decades, from SCORE through DSCS III, UFO, and Milstar. Capabilities have grown dramatically with the development of satellite and electronics technologies. Higher-power and wider-bandwidth satellites have enabled increased information transmission to an ever-wider assortment of terminal types deployed with an increasing number and variety of military units. Throughout this history, and now, Aerospace has been involved in every phase of development and deployment of DOD satellite communication systems, from concept development and requirements definition through design and test reviews to launch preparations and on-orbit testing and operations. Aerospace regularly applies lessons learned in the course of one program to all DOD satellite programs. As military satellite communication systems improve, they continue to provide information superiority to the U.S. military. This enables our military forces to remain dominant in the increasing speed and diversity of their actions during times of peace as well as times of conflict.

#### Hege collapse causes global instability

Kagan ‘12

[Robert Kagan is a senior fellow in foreign policy at the Brookings Institution and a columnist for The Washington Post. “Not fade away: the myth of American decline.” <http://www.tnr.com/article/politics/magazine/99521/america-world-power-declinism?page=0,0&passthru=ZDkyNzQzZTk3YWY3YzE0OWM5MGRiZmIwNGQwNDBiZmI> ETB]

Is the United States in decline, as so many seem to believe these days? Or are Americans in danger of committing pre-emptive superpower suicide out of a misplaced fear of their own declining power? A great deal depends on the answer to these questions. The present world order—characterized by an unprecedented number of democratic nations; a greater global prosperity, even with the current crisis, than the world has ever known; and a long peace among great powers—reflects American principles and preferences, and was built and preserved by American power in all its political, economic, and military dimensions. If American power declines, this world order will decline with it. It will be replaced by some other kind of order, reflecting the desires and the qualities of other world powers. Or perhaps it will simply collapse, as the European world order collapsed in the first half of the twentieth century. The belief, held by many, that even with diminished American power “the underlying foundations of the liberal international order will survive and thrive,” as the political scientist G. John Ikenberry has argued, is a pleasant illusion. American decline, if it is real, will mean a different world for everyone.

#### Cyber deterrence fails

Gelinas ‘10

(Ryan Richard, thesis for Master of Arts¶ in Security Studies from Georgetown, “CYBERDETERRENCE AND THE PROBLEM OF ATTRIBUTION” <https://repository.library.georgetown.edu/bitstream/handle/10822/553494/gelinasRyan.pdf?sequence=1>, SEH)

The set of cases analyzed here demonstrate decisively that **attribution of cyber attacks is** ¶ **technically difficult and often politically unpalatable.** **Established networking protocols allow** ¶ **easy spoofing and obfuscation of source, destination, and intent of packets as they stream around** ¶ **the world**. **Attribution**, as demonstrated in these cases, **is often circumstantial at best. While** ¶ **victims often have strong suspicions** of attackers‘ identities built from pieces of intelligence**, the** ¶ **decisions of war and peace involved in a deterrence policy require a higher level of confidence** ¶ **than a measured hunch**. To reach even elementary levels of attribution significant resources, ¶ expertise, and time are required.¶ **The chilling suspicion of the unknown unknowns, the realization that undetected attacks** ¶ **may be underway at any moment, is potentially paralyzing to any deterrence policy**. **A** ¶ **deterrence policy of ―I will attack you back if you attack me, but only if I find out that you did it‖** ¶ **is not an appropriate cornerstone of a computer network defense strategy**. Without a response, ¶ an attacker can assume that the victim is either unable to detect the attack or, even more ¶ emboldening, the victim is unable or unwilling to make good on its threat. Cyber attacks can be ¶ a powerful part of salami tactics on the part of the attacker. If attacks are unable to generate a ¶ deterrent response in the cyber realm, what other lines can the attacker cross?¶ Addressing cases where the victim state realizes that it is being attacked, Lt. Gen. Keith ¶ Alexander, director of the National Security Agency, recently proposed that his future U.S. ¶ CYBERCOMMAND would support a deterrence doctrine by attacking back in a proportional and discriminating way against the sources of any cyber attack against the United States.¶ 69¶ He ¶ extended this case specifically to those where the identities of the attackers are unknown. ¶ **According to Gen. Alexander, the U.S. will attack back in accordance with the rules of** ¶ **engagement and in accordance with the principles of proportionality and discrimination, with the** ¶ **caveat that ―neither proportionality nor discrimination requires that we know who is responsible** ¶ **before we take defensive action.‖**¶ 70¶ **With statements like this, Gen. Alexander and others are** ¶ **providing a strong incentive for enemies of the U.S. to launch cyber attacks on the United States** ¶ **from third-party territory, hoping to lure the U.S. into conflict with a nation that had no role in or** ¶ **idea of the attack**.¶ **What the cases analyzed in this paper illustrate is that deterrence is a phenomenally poor** ¶ **choice as a core component in a computer network defense strateg**y. Bloviation and bluster, ¶ vowing deterrent responses to attacks, make for good sound bites and allow for easy porting of¶ deep deterrence scholarship to the cyber realm. But less flashy policies and measures are more ¶ effective. **Defense in depth, better security standards for software and hardware, robust** ¶ **computer network intelligence systems, and information sharing between and among industry** ¶ **and government are all good and necessary elements of a more successful computer network** ¶ **defense strategy**. Combined with aggressive hack-back defensive measures that work to disrupt ¶ or exploit attacker infrastructure, vital networks will be better defended and deterrence as a ¶ general national policy tool will be better preserved for realms where it is more applicable.

#### Small nuclear reactors key to prevent bases from being vulnerable to inevitable grid outages.

Andres and Breetz ‘11

(Richard B. Andres is 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 is a 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” Institute for National Strategic Studies, <http://www.ndu.edu/press/lib/pdf/strforum/sf-262.pdf>, SEH)

Grid Vulnerability**. DOD is unable to provide its** ¶ **bases with electricity when the civilian electrical grid is** ¶ **offline for an extended period of time**. Currently, **domestic military installations receive 99 percent of their** ¶ **electricity from the civilian power grid**. As explained in a ¶ recent study from the Defense Science Board:¶ DOD’s key problem with electricity is **that critical** ¶ **missions, such as national strategic awareness and** ¶ **national command authorities, are almost entirely** ¶ **dependent on the national transmission grid** . . . ¶ **[which] is fragile, vulnerable, near its capacity** ¶ **limit, and outside of DOD control**. In most cases, ¶ **neither the grid nor on-base backup power provides**¶ **sufficient reliability to ensure continuity of critical** ¶ **national priority functions and oversight of** ¶ **strategic missions in the face of** a long term (several ¶ months) **outage**.¶ 7¶ The grid’s fragility was demonstrated during the 2003 ¶ Northeast blackout in which 50 million people in the ¶ United States and Canada lost power, some for up to a ¶ week, when one Ohio utility failed to properly trim trees. ¶ The blackout created cascading disruptions in sewage ¶ systems, gas station pumping, cellular communications, ¶ border check systems, and so forth, and demonstrated the ¶ interdependence of modern infrastructural systems.¶ 8¶ More recently, awareness has been growing that ¶ **the grid is also vulnerable to purposive attacks**. A report sponsored by the Department of Homeland Security suggests **that a coordinated cyberattack on the grid** ¶ **could result in a third of the country losing power for** ¶ **a period of weeks or months**.¶ 9¶ Cyberattacks on critical ¶ infrastructure are not well understood. It is not clear, for ¶ instance, whether existing terrorist groups might be able ¶ to develop the capability to conduct this type of attack. **It** ¶ **is likely, however, that some nation-states either have or** ¶ **are working on developing the ability to take down the** ¶ **U.S. grid**. **In the event of a war** with one of these states, ¶ it is possible, if not likely, that **parts of the civilian grid** ¶ **would cease to function, taking with them military bases** ¶ **located in affected regions.**¶ Government and private organizations are currently ¶ working to secure the grid against attacks; however, it is ¶ not clear that they will be successful. Most military bases ¶ currently have backup power that allows them to function for a period of hours or, at most, a few days on their ¶ own. If power were not restored after this amount of time, ¶ the results could be disastrous. First, military assets taken ¶ offline by the crisis would not be available to help with disaster relief. Second, **during an extended blackout, global** ¶ **military operations could be seriously compromised; this** ¶ **disruption would be particularly serious if the blackout** ¶ **was induced during major combat operations.** During the ¶ Cold War, this type of event was far less likely because the United States and Soviet Union shared the common understanding that blinding an opponent with a grid blackout could escalate to nuclear war. America’s current opponents, however, may not share this fear or be deterred ¶ by this possibility.¶ In 2008, the Defense Science Board stressed that ¶ DOD should mitigate the electrical grid’s vulnerabilities by turning military installations into “islands” of ¶ energy self-sufficiency.¶ 10¶ **The department has made efforts to do so by promoting efficiency programs** that ¶ lower power consumption on bases and by constructing ¶ renewable power generation facilities on selected bases. ¶ **Unfortunately, these programs will not come close to** ¶ **reaching the goal of islanding the vast majority of bases.** ¶ **Even with massive investment in efficiency and renewables, most bases would not be able to function for more** ¶ **than a few days after the civilian grid went offline**. **Unlike other alternative sources of energy, small reactors have the potential to solve DOD’s vulnerability to** ¶ **grid outages.** **Most bases have relatively light power demands when compared to civilian towns or cities. Small** ¶ **reactors could easily support bases’ power demands separate from the civilian grid during crises**. In some cases, ¶ the reactors could be designed to produce enough power ¶ not only to supply the base, but also to provide critical ¶ services in surrounding towns during long-term outages.¶ Strategically, islanding bases with small reactors ¶ has another benefit. **One of the main reasons an enemy** ¶ **might be willing to risk reprisals by taking down the** ¶ **U.S. grid during a period of military hostilities would** ¶ **be to affect ongoing military operations. Without the** ¶ **lifeline of intelligence, communication, and logistics** ¶ **provided by U.S. domestic bases, American military operations would be compromised in almost any conceivable contingency. Making bases more resilient to** ¶ **civilian power outages would reduce the incentive for** ¶ **an opponent to attack the grid.** An opponent might ¶ still attempt to take down the grid for the sake of disrupting civilian systems, but **the powerful incentive to** ¶ **do so in order to win an ongoing battle or war would** ¶ **be greatly reduced.**

#### Advantage 2 is Nuclear Leadership US is losing nuclear competitiveness to China and Russia

Scientific America 3/27

(David Biello, “Small Reactors Make a Bid to Revive Nuclear Power¶ Can small, LEGO-like reactors help create better prospects for the nuclear industry?” <http://www.scientificamerican.com/article.cfm?id=small-reactors-bid-to-revive-nuclear-power&print=true>, SEH)

Regardless of how cheap such small modular reactors may allow nuclear to be in future, it is unlikely to be as cheap as natural-gas-fired turbines in the present. In fact, low natural gas prices stalled the U.S. nuclear renaissance outside Georgia and South Carolina, long before the reactor meltdowns at Fukushima Daiichi in Japan. "Because of an unanticipated abundance of natural gas in the United States, nuclear energy, in general, is facing tough competition," noted an analysis of the prospects for small modular reactors from the University of Chicago published last November. The analysis also suggested that small reactors would be more expensive than large reactors on a per-megawatt basis until manufacturing in significant quantities has happened. "It [is] unlikely that SMRs will be commercialized without some form of government incentive."¶ But the Department of Energy funding may only support two designs. Innovation spurred by competition seems unlikely. And that may ultimately erode the current U.S. nuclear industry advantage—from design to operation to regulation.¶ That means that the rest of the world—particularly China, which is building almost every type of reactor on offer, and Russia—may well inherit the promise and peril of nuclear power, whether small or large. "China and India lead the world in nuclear safety today," NRG CEO David Crane told the Bloomberg New Energy Finance Summit on March 20. NRG initiated and abandoned plans to build at least two new large reactors in the last five years, thanks to falling natural gas prices and uncertainty surrounding U.S. government policy. "The U.S. cannot lead the world in safety, if we're not building new nuclear power plants."

#### Now is key China gaining nuclear leadership and will export

Wang 8/22

(Brian Wang, Director of Research for Next Big Future. “Guardian Analysis of Nuclear Power has the Typical Bias” AUGUST 22, 2012 Accessed online at <http://nextbigfuture.com/2012/08/guardian-analysis-of-nuclear-power-has.html>)

In 2007, the reported cost for the first two AP1000 units under construction in China was $5.3 billion. The output of the AP1000 is 1,117 MWe. In 2009, the published cost for 4 AP1000 reactors under construction in China was a total of $8 billion. In 2010, the Chinese nuclear commission expect construction costs would fall significantly once full scale mass production is underway. In addition, a domestic CAP1400 design based on the AP1000 is due to start construction in April 2013 with a scheduled start of 2017. Once the CAP1400 design has been proven, work is scheduled for a CAP1700 design with a target construction cost of $1000/kW¶ China's nuclear plants are 2.5 times cheaper than the US$10 billion price quoted and could become 4 times cheaper. China is likely to build about half of the world's expected nuclear reactors and they will begin exporting them. South Korea has prices as good as China. Russia and India are close to the same price range.¶ Tickell analysis - Assume a 2% growth in primary energy demand per year over the next 35 years, and that demand will double to some 24,000 Mtoe. Rely on nuclear power to accommodate all the growth, and knock out 4,000 Mtoe-worth of coal, and it will have to produce 16,000 Mtoe of energy per year – a 25-fold increase on its current level. Today the world has 440 operational nuclear reactors, so 25 times more means 11,000 reactors. ¶ NBF corrections More mistakes here as well. The world has 433 nuclear reactors that when all operating are producing 369 GWe of power. The average size is 840 MWe. Looking at the large nuclear reactors like the AP1000, CAP1400 and CAP1700 then there would far fewer reactors needed because some would be over twice the size as the average reactor of today. Also, there is new annular fuel uprating that should become commercial in South Korea and around the world in the 2020s. This will boost existing and future reactors by 20-50% in power generation.¶ The higher per unit price quote does not look at new small modular reactors which are being developed. These units will be factory mass produced and will be smaller in size from 10 to 300 MWe in size.¶ In total the costs for nuclear energy to replace all additional fossil fuel for the next 35 years would be more in range of $30 trillion. The analysis is not complete because the comparison of costs needs to look at the costs for the alternatives of wind, solar and other power generation. Wind has the problem that if wind was the sole basis for new power generation it would a warming effect as well.¶ Earth System Dynamics journal - Estimating maximum global land surface wind power extractability and associated climatic consequences. 17 Terawatts of electrical wind power would be 50-95% of the maximum land based wind possible with significant climate effects. There would be temperature and rain differences.¶ If we used todays costs for wind and solar and the costs for grid buildout and an emissions free system to achieve consistent power, then wind and solar would be far more expensive than nuclear power.

#### SMR key to nuclear leadership

Rosner and Goldberg ‘11

(Robert Rosner, astrophysicist and founding director of the Energy Policy Institute at Chicago. He was the director of Argonne National Laboratory from 2005 to 2009, Stephen Goldberg, Special Assistant to the Director, Argonne National Laboratory ¶ Senior Fellow, Energy Policy Institute at Chicago¶ Research Coordinator, Global Nuclear Future Initiative ¶ American Academy of Arts and Sciences, “Small Modular Reactors – Key to Future Nuclear Power ¶ Generation in the U.S.” Energy Policy Institute at Chicago, <http://csis.org/files/attachments/111129_SMR_White_Paper.pdf>, SEH)

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.

#### US dominance in SMR’s key to nuclear leadership which prevents proliferation

Loudermilk ‘11

(Micah J. Loudermilk is a Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University, “Small Nuclear Reactors and US Energy Security: Concepts, Capabilities, and Costs” Journal of Energy Security, May 2011, <http://www.ensec.org/index.php?option=com_content&view=article&id=314:small-nuclear-reactors-and-us-energy-security-concepts-capabilities-and-costs&catid=116:content0411&Itemid=375>, SEH)

Combating proliferation with US leadership¶ Reactor safety itself notwithstanding, many argue that the scattering of small reactors around the world would invariably lead to increased proliferation problems as nuclear technology and know-how disseminates around the world. Lost in the argument is the fact that this stance assumes that US decisions on advancing nuclear technology color the world as a whole. In reality, **regardless of the US commitment to or abandonment of nuclear energy technology, many countries (notably China) are blazing ahead with research and construction**, with 55 plants currently under construction around the world—**though Fukushima may cause a temporary lull**.¶ Since Three Mile Island, the US share of the global nuclear energy trade has declined precipitously as talent and technology begin to concentrate in countries more committed to nuclear power. **On the small reactor front, more than 20 countries are examining the technology and the IAEA estimates that 40-100 small reactors will be in operation by 2030. Without US leadership, new nations seek to acquire nuclear technology turn to countries other than the US who may not share a deep commitment to reactor safety and nonproliferation objectives. Strong US leadership globally on nonproliferation requires a vibrant American nuclear industry.** **This will enable the US to set and enforce standards on nuclear agreements, spent fuel reprocessing, and developing reactor technologies**.¶ **As to the small reactors themselves, the designs achieve a degree of proliferation-resistance unmatched by large reactors. Small enough to be fully buried underground in independent silos, the concrete surrounding the reactor vessels can be layered much thicker than the traditional domes that protect conventional reactors without collapsing.** Coupled with these two levels of superior physical protection is the traditional security associated with reactors today. Most small reactors also are factory-sealed with a supply of fuel inside. Instead of refueling reactors onsite, SMRs are returned to the factory, intact, for removal of spent fuel and refueling**. By closing off the fuel cycle, proliferation risks associated with the nuclear fuel running the reactors are mitigated and concerns over the widespread distribution of nuclear fuel allayed.**

#### Without increase in domestic demand- US loses leadership

Domenici and Miller 7/1

(“Pete, BPC Senior Fellow ¶ Co-chair, BPC Nuclear Initiative, Warren, Co-chair, BPC Nuclear Initiative

Former Assistant Secretary for Nuclear Energy, U.S. Department of Energy, “Maintaining U.S. ¶ Leadership in Global ¶ Nuclear Energy Markets” <http://bipartisanpolicy.org/sites/default/files/Leadership%20in%20Nuclear%20Energy%20Markets.pdf>, SEH)

With the world’s largest commercial nuclear fleet, **the United States was once the world’s** ¶ **leader in nuclear technology** development and operations. **In recent years, other countries,** ¶ **notably France and South Korea, have risen in international prominenc**e; these countries ¶ will continue to develop technologies for domestic markets as well as to export. **It will be** ¶ **increasingly difficult for the United States to maintain its technological leadership without** ¶ **some near-term domestic demand for new construction. Diminished U.S. leadership will** ¶ **make U.S. firms less competitive in nuclear export markets while also reducing U.S.** ¶ **influence over nuclear developments abroad**. As more countries seek to develop nuclear ¶ capacity, the United States must work with the international community to minimize the risk ¶ of nuclear weapons proliferation.

#### DOD action key to nuclear leadership

Yurman ‘11

(Dan, Journalist for Fuel Cycle Week, “Two new entries to market for small modular reactors” <http://theenergycollective.com/dan-yurman/52074/two-new-entries-market-small-modular-reactors>, SEH)

A paper on SMRs published by the National Defense University explores the application of small reactors at military bases.¶ Richard B. Andres and Hanna L. Breetz write that **without Department of Defense (DOD) intervention, the United States runs the risk of a small reactor market dominated by foreign countries, further eroding U.S. commercial nuclear power capabilities and damaging U.S. control over nuclear energy proliferation.**¶ **DOD has recently expressed interest in the possibility of integrating small nuclear reactors on military bases as part of its strategy to “island” bases from the fragile civilian power grid.**¶ Small nuclear reactor technology offers a host of benefits over traditional large reactors—namely, a smaller footprint, scalable design, factory-based construction, portability, and passive safety features.¶ **DOD has a chance to become a “first mover” in the emerging small reactor market; by providing assistance and guidance to the private sector, DOD can ensure that successful designs meet its operational needs.**

#### Now is key to beat out competitors

Freed ‘10

(Josh, Director of the Third Way Clean Energy Program, Elizabeth Horwitz is a Policy Advisor at Third Way’s Clean Energy ¶ Program, Jeremy Ershow was formerly a Policy ¶ Advisor at Third Way, “Thinking Small On Nuclear Power” <http://content.thirdway.org/publications/340/Third_Way_Idea_Brief_-_Thinking_Small_On_Nuclear_Power.pdf>, SEH)

**Getting small reactors deployed quickly is a national imperative. Our energy** ¶ **needs demand it, and the economic upside of becoming a leader in this space** ¶ **is tremendous**. Moreover, **the moment for economic leadership is fleeting,** ¶ **with emerging international competitors including designs backed by the** ¶ **governments of South Korea, China, India, and Russia.**¶ **3**0¶ The **federal government** ¶ **has unique resources to help this happen, and we should put them to use**. This ¶ includes its research and development from our national labs or the purchasing ¶ power of DOD or DOE to create first markets and help drive down costs of firstmover technologies.

#### Unchecked nuclear spread will cause global nuclear war – shorter flight times and lack of second strike capacity.

Cimbala ‘08

(Stephen, Political Science Professor at the University of Pennsylvania, March, “Anticipatory Attacks: Nuclear Crisis Stability in Future Asia” Comparative Strategy, Vol 27 No 2, p 113-132, InformaWorld)

**The spread of** ballistic missiles and other **nuclear**-capable delivery **systems in Asia, or in the Middle East** with reach into Asia, **is especially dangerous because** plausible **adversaries live close together and are already engaged in** ongoing **disputes** about territory or other issues.13 The **Cold War** Americans and Soviets **required missiles** and airborne delivery systems **of intercontinental range** to strike at one another’s vitals. But **short-range ballistic missiles** or fighter-bombers **suffice for India and Pakistan** to launch attacks at one another **with** potentially **“strategic” effects. China shares borders with Russia, North Korea, India, and Pakistan; Russia, with China and NorthKorea; India, with Pakistan and China; Pakistan, with India and China;** and so on. The **short flight times of ballistic missiles** between the cities or military forces of contiguous states **means** that **very little time** will be available **for warning and attack assessment** by the defender. **Conventionally armed missiles could easily be mistaken for** a tactical **nuclear first use.** Fighter-bombers appearing over the horizon could just as easily be carrying nuclear weapons as conventional ordnance. In addition to the challenges posed by shorter flight times and uncertain weapons loads, potential **victims of nuclear attack in Asia may also have first strike–vulnerable forces and command-control systems that increase decision pressures for rapid,** and possibly mistaken, **retaliation. This** potpourri of possibilities **challenges conventional wisdom about** nuclear **deterrence** and proliferation on the part of policymakers and academic theorists. For policymakers in the United States and NATO, spreading nuclear and other weapons of mass destruction in Asia could profoundly shift the geopolitics of mass destruction from a European center of gravity (in the twentieth century) to an Asian and/or Middle Eastern center of gravity (in the present century).14 This would profoundly shake up prognostications to the effect that wars of mass destruction are now passe, on account of the emergence of the “Revolution in Military Affairs” and its encouragement of information-based warfare.15 Together with this, there has emerged the argument that large-scale war between states or coalitions of states, as opposed to varieties of unconventional warfare and failed states, are exceptional and potentially obsolete.16 **The spread** of WMD and ballistic missiles in Asia **could overturn** these **expectations for the obsolescence** or marginalization **of major interstate warfare**. For theorists, **the argument that the spread of nuclear weapons might be** fully **compatible with international stability**, and perhaps even supportive of international security, **may be less sustainable** than hitherto.17 Theorists optimistic about the ability of the international order to accommodate the proliferation of nuclear weapons and delivery systems in the present century have made several plausible arguments based on international systems and deterrence theory. First, nuclear weapons may make states more risk averse as opposed to risk acceptant, with regard to brandishing military power in support of foreign policy objectives. Second, if states’ nuclear forces are second-strike survivable, they contribute to reduced fears of surprise attack. Third, the motives of states with respect to the existing international order are crucial. Revisionists will seek to use nuclear weapons to overturn the existing balance of power; status quo–oriented states will use nuclear forces to support the existing distribution of power, and therefore, slow and peaceful change, as opposed to sudden and radical power transitions. **These arguments**, for a less alarmist viewof nuclear proliferation, **take comfort from the** history of nuclear policy in the “first nuclear age,” roughly corresponding to the **Cold War**.18 Pessimists who predicted that some thirty or more states might have nuclear weapons by the end of the century were proved wrong. However**, the Cold War is a dubious precedent for** the control of **nuclear weapons spread outside of Europe**. The military and security agenda of the ColdWar was dominated by the United States and the Soviet Union, especially with regard to nuclear weapons. **Ideas about mutual deterrence based on second-strike** capability **and** the deterrence **“rationality”** according to American or allied Western concepts **might be inaccurate** guides to the avoidance of war outside of Europe.19

#### Proliferation risks nuclear war due to brinkmanship games- questions of deterrence miss the point.

Kroenig ‘12

(Matthew, assistant professor of Government at Georgetown University and a Stanton Nuclear Security Fellow at the Council on Foreign Relations, “The History of Proliferation Optimism: Does It Have A Future?” Non Proliferation Policy Center, <http://npolicy.org/article.php?aid=1182&tid=30#_ftn11>, SEH)

First and foremost, **proliferation optimists do not appear to understand contemporary deterrence** theory. I do not say this lightly in an effort to marginalize or discredit my intellectual opponents. Rather, I make this claim with all due caution and with complete sincerity. A careful review of the contemporary proliferation optimism literature does not reflect an understanding of, or engagement with, the developments in academic deterrence theory in top scholarly journals such as the American Political Science Review and International Organization over the past few decades.[35] While early optimists like Viner and Brodie can be excused for not knowing better, the writings of **contemporary proliferation optimists ignore the past fifty years of academic research on nuclear deterrence theory.** ¶ **In the 1940s**, Viner, **Brodie**, and others **argued that the advent of** Mutually Assured Destruction (**MAD) rendered war among major powers obsolete, but nuclear deterrence theory soon advanced beyond that simple understanding**.[36**] After all, great power political competition does not end with nuclear weapons. And nuclear-armed states still seek to threaten nuclear-armed adversaries. States cannot credibly threaten to launch a suicidal nuclear war, but they still want to coerce their adversaries**. **This leads to a credibility problem: how can states credibly threaten a nuclear-armed opponent?** **Since the 1960s academic nuclear deterrence theory has been devoted almost exclusively to answering this question**.[37] **And, unfortunately for proliferation optimists, the answers do not give us reasons to be optimistic.**¶ Thomas Schelling was the first to devise a rational means by which states can threaten nuclear-armed opponents.[38] He argued that **leaders cannot credibly threaten to intentionally launch a suicidal nuclear war, but they can make a “threat that leaves something to chance**.”[39] **They can engage in a process, the nuclear crisis, which increases the risk of nuclear war in an attempt to force a less resolved adversary to back down. As states escalate a nuclear crisis there is an increasing probability that the conflict will spiral out of control and result in an inadvertent or accidental nuclear exchange**. **As long as the benefit of winning the crisis is greater than the incremental increase in the risk of nuclear war, threats to escalate nuclear crises are inherently credible. In these games of nuclear brinkmanship, the state that is willing to run the greatest risk of nuclear war before back down will win the crisis as long as it does not end in catastrophe.** It is for this reason that Thomas Schelling called great power politics in the nuclear era a “competition in risk taking.”[40] **This does not mean that states eagerly bid up the risk of nuclear war. Rather, they face gut-wrenching decisions at each stage of the crisis. They can quit the crisis to avoid nuclear war, but only by ceding an important geopolitical issue to an opponent. Or they can the escalate the crisis in an attempt to prevail, but only at the risk of suffering a possible nuclear exchange.**¶ **Since 1945 there were have been many high stakes nuclear crises** (by my count, there have been twenty) **in which “rational” states like the United States run a risk of nuclear war and inch very close to the brink of nuclear war.[**41] **By asking whether states can be deterred or not, therefore, proliferation optimists are asking the wrong question. The right question to ask is: what risk of nuclear war is a specific state willing to run against a particular opponent in a given crisis?** Optimists are likely correct when they assert that Iran will not intentionally commit national suicide by launching a bolt-from-the-blue nuclear attack on the United States or Israel. This does not mean that Iran will never use nuclear weapons, however. Indeed, it is almost inconceivable to think that a nuclear-armed Iran would not, at some point, find itself in a crisis with another nuclear-armed power and that it would not be willing to run any risk of nuclear war in order to achieve its objectives. If a nuclear-armed Iran and the United States or Israel have a geopolitical conflict in the future, over say the internal politics of Syria, an Israeli conflict with Iran’s client Hezbollah, the U.S. presence in the Persian Gulf, passage through the Strait of Hormuz, or some other issue, do we believe that Iran would immediately capitulate? Or is it possible that Iran would push back, possibly even brandishing nuclear weapons in an attempt to deter its adversaries? If the latter, there is a real risk that proliferation to Iran could result in nuclear war.¶ **An optimist might counter that nuclear weapons will never be used, even in a crisis situation, because states have such a strong incentive, namely national survival, to ensure that nuclear weapons are not used. But, this objection ignores the fact that leaders operate under competing pressures. Leaders in nuclear-armed states also have very strong incentives to convince their adversaries that nuclear weapons could very well be used.** Hi**storically we have seen that in crises, leaders purposely do things like put nuclear weapons on high alert and delegate nuclear launch authority to low level commanders, purposely increasing the risk of accidental nuclear war in an attempt to force less-resolved opponents to back down**.¶ Moreover, **not even the optimists’ first principles about the irrelevance of nuclear posture stand up to scrutiny. Not all nuclear wars would be equally devastating**.[42] Any nuclear exchange would have devastating consequences no doubt, but, **if a crisis were to spiral out of control and result in nuclear war, any sane leader would rather be facing a country with five nuclear weapons than one with thirty-five thousand. Similarly, any sane leader would be willing to run a greater risk of nuclear war against the former state than against the latter. Indeed, systematic research has demonstrated that states are willing to run greater risks and, therefore, more likely to win nuclear crises when they enjoy nuclear superiority over their opponent**.[43] **Proliferation optimists miss this point, however, because they are still mired in 1940s deterrence theory.** **It is true that no rational leader would choose to launch a nuclear war, but, depending on the context, she would almost certainly be willing to risk one**. **Nuclear deterrence theorists have proposed a second scenario under which rational leaders could instigate a nuclear exchange**: a limited nuclear war.[44] **By launching a single nuclear weapon against a small city,** for example, **it was thought that a nuclear-armed state could signal its willingness to escalate the crisis, while leaving its adversary with enough left to lose to deter the adversary from launching a full-scale nuclear response**. In a future crisis between a nuclear-armed China and the United States over Taiwan, for example, China could choose to launch a nuclear attack on Honolulu to demonstrate its seriousness. In that situation, with the continental United States intact, would Washington choose to launch a full-scale nuclear war on China that could result in the destruction of many more American cities? Or would it back down? China might decide to strike hoping that Washington will choose a humiliating retreat over a full-scale nuclear war. If launching a limited nuclear war could be rational, it follows that the spread of nuclear weapons increases the risk of nuclear use. **Again, by ignoring contemporary developments in scholarly discourse and relying exclusively on understandings of nuclear deterrence theory that became obsolete decades ago, optimists reveal the shortcomings of their analysis and fail to make a compelling case.**

#### Proliferation draws major powers in to regional disputes

Kroenig 9

(Matthew, assistant professor of Government at Georgetown University and a Stanton Nuclear Security Fellow at the Council on Foreign Relations, “Beyond Optimism and Pessimism: ¶ The Differential Effects of Nuclear Proliferation” Harvard Kennedy School of Government, <http://belfercenter.ksg.harvard.edu/files/Beyond-Optimism-and-Pessimism.pdf>, SEH)

**There is direct evidence that regional conflicts involving nuclear powers can** ¶ **encourage power-projecting states to become involved in nuclear disputes**. Secretary of ¶ State Henry **Kissinger was reluctant to aid Israel in the 1973 Yom Kippur War until Israeli** ¶ **Prime Minister** Golda Meir **threatened that, without U.S. assistance, she might be forced to** ¶ **use nuclear weapons** against the Arab armies.¶ 52¶ In response, Kissinger reversed his decision ¶ and provided emergency aid to the Israeli Defense Forces.¶ 53¶ The Soviet Union also ¶ considered a military intervention to help its Arab proxies in the Yom Kippur War, causing ¶ the United States to go on nuclear alert, and leading leaders in both Moscow and ¶ Washington to consider the very real possibility that a conflict involving a regional nuclear ¶ power could spiral into a superpower war.¶ 54¶ Similarly, in 1999 and 2002, the United States became caught in diplomatic initiatives to prevent nuclear war in crises between the nuclear armed countries of India and Pakistan.¶ 55¶ ¶ Indeed, **the expectation that powerful states will intervene in conflicts involving a** ¶ **nuclear-armed state is so firmly ingrained in the strategic thinking of national leaders that** ¶ **small nuclear powers actually incorporate it into their strategic doctrines**. South Africa’s ¶ nuclear doctrine envisioned, in the event of an imminent security threat, the detonation of a ¶ nuclear weapon, not against the threatening party, but over the Atlantic Ocean in an attempt ¶ to jolt the United States into intervening on South Africa’s behalf.¶ 56¶ Israel’s nuclear ¶ doctrine was also constructed along similar lines. While the Israelis are notoriously silent ¶ about the existence and purpose of their nuclear arsenal, Francis Perrin, a French official ¶ who assisted in the development of Israel’s nuclear program in the 1950s and 1960s, ¶ explained that Israel’s arsenal was originally aimed “against the Americans, not to launch ¶ against America, but to say ‘If you don’t want to help us in a critical situation, we will require you to help us. Otherwise, we will use our nuclear bombs. Similarly, Pakistan’s surprise raid on Indian-controlled Kargil in 1999 was motivated partly by the expectation that Pakistan would be able to retain any territory it was able to seize quickly, because Pakistani officials calculated that the United States would never allow an extended conflict in nuclear South Asia.

#### That leads to great power war

Kroenig 9

(Matthew, assistant professor of Government at Georgetown University and a Stanton Nuclear Security Fellow at the Council on Foreign Relations, “Beyond Optimism and Pessimism: ¶ The Differential Effects of Nuclear Proliferation” Harvard Kennedy School of Government, <http://belfercenter.ksg.harvard.edu/files/Beyond-Optimism-and-Pessimism.pdf>, SEH)

**Leaders in power-projecting states also fear that regional instability set off by nuclear**¶ **proliferation could entrap power-projecting states in a great power war**. O**ther power projecting states, facing a mirror-image situation, may feel compelled to intervene in a crisis** ¶ **to secure their own interests, entangling multiple great powers in a regional conflict.** In a¶ 1963 NIE, U.S. intelligence analysts assessed that **“the impact of (nuclear proliferation in the**¶ **Middle East) will be the possibility that hostilities arising out of existing or future** ¶ **controversies could escalate into a confrontation involving the major powers**.”¶ 67¶ President ¶ Johnson believed that a nuclear Israel meant increased Soviet involvement in the Middle¶ East and perhaps superpower war.¶ 68¶ If historical experience provides a guide, U.S. ¶ strategists at the time of writing are undoubtedly concerned by the possibility that China m¶ feel compelled to intervene in any conflict involving a nuclear-armed North Korea, making the Korean Peninsula another dangerous flash-point in the uncertain Sino-American strategic relationship.

## Plan

#### The United States Department of Defense should procure small modular reactors for use on military bases within the United States.

#### Military procurement- solves commercial use proliferation and islanding- avoid regulation

Andres and Loudermilk 10

(Richard B. Andres, Professor of ¶ national Security Strategy at the ¶ national War College and a Senior fellow and energy and environmental ¶ Security and Policy Chair in the Center ¶ for Strategic research, institute for national Strategic Studies, at the national Defense University, Micah J, Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University, “Small Reactors and the Military’s Role in Securing America’s Nuclear IndustryPosted” <http://robertmayer.wordpress.com/2010/08/28/small-reactors-and-the-militarys-role-in-securing-americas-nuclear-industryposted/>, SEH)

Unlike private industry, **the military does not face the same regulatory and congressional hurdles to constructing reactors and would have an easier time in adopting them for use**. **By integrating small nuclear reactors as power sources for domestic U.S. military bases, three potential energy dilemmas are solved at the same time**. First, by incorporating small reactors at its bases, **the military addresses its own energy security quandary**. **The military has recently sought to “island” its bases in the U.S. -protecting them from grid outages**, be they accidental or intentional. **The Department of Defense has promoted this endeavor through lowering energy consumption on bases and searching for renewable power alternatives, but these measures alone will prove insufficient**. **Small reactors provide sufficient energy output to power military installations** and in some cases surrounding civilian population centers.¶ **Secondly, as the reactors become integrated on military facilities, the stigma on the nuclear power industry will ease and inroads will be created for the adoption of small-scale reactors as a viable source of energy. Private industry and the public will see that nuclear reactors can indeed be utilized safely and effectively, resulting in a renewed push toward the expansion of nuclear power**. Although many of the same hurdles will still be in place, **a shift in public opinion and a stronger effort by utilities, coupled with the demonstrated success of small reactors on military bases, could prove the catalysts necessary for the federal government and the NRC to take more aggressive action**.¶ Finally, while new reactors are not likely in the near future**, the military’s actions will preserve, for a while longer, the badly ailing domestic nuclear energy industry. Nuclear power is here to stay around the globe, and the United States has an opportunity to take a leading role in supplying the world’s nuclear energy and reactor technology.** With the U.S. nuclear industry dormant for three decades, much of the attention, technology, and talent have concentrated overseas in countries with a strong interest in nuclear technology. **Without the United States as a player in the nuclear energy market, it has little say over safety regulations of reactors or the potential risks of proliferation from the expansion of nuclear energy. If the current trend continues, the U.S. will reach a point where it is forced to import nuclear technology and reactors from other countries. Action by the military to install reactors on domestic bases will both guarantee the survival of the American nuclear industry in the short term, and work to solidify support for it in the long run.**¶ Ultimately**, between small-scale nuclear reactors and the U.S. military, the capability exists to revitalize America’s sleeping nuclear industry and promoting energy security and clean energy production**. The reactors offer the ability to power domestic military bases, small towns, and other remote locations detached from the energy grid. Furthermore, reactor sites can house multiple units, allowing for greater energy production – rivaling even large reactors. **Small reactors offer numerous benefits to the United States and a path initiated by the military presents a realistic route by which their adoption can be achieved.**

#### DOD key- prevents unfavorable lock-in

Andres and Breetz 11

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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 demonstration effects, technological interdependence, network 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 market. 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 designs. On one hand, Matthew Bunn and Martin Malin 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 settings in which they can be used, and it is quite possible 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.**

#### DoD is key to solve islanding - historical role

Andres and Breetz 11

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Conclusion¶ **The preceding analysis suggests that DOD should** ¶ **seriously consider taking a leadership role on small reactors.** This new technology has the potential to solvetwo ¶ of the most serious energy-related problems faced by the ¶ department today. Small **reactors could island domestic** ¶ **military bases and nearby communities, thereby protecting them from grid outages.** **They could also drastically** ¶ **reduce the need for the highly vulnerable fuel convoys** ¶ **used to supply forward operating bases abroad.**¶ The technology being proposed for small reactors ¶ (much of which was originally developed in U.S. Government labs) is promising. A number of the planned ¶ designs are self-contained and highly mobile, and could ¶ meet the needs of either domestic or forward bases. ¶ Some promise to be virtually impervious to accidents, ¶ with design characteristics that might allow them to be used even in active operational environments. These reactors are potentially safer than conventional light water reactors**. The argument that this technology could** ¶ **be useful at domestic bases is virtually unassailable.** The ¶ argument for using this technology in operational units ¶ abroad is less conclusive; however, because of its potential to save lives, it warrants serious investigation. ¶ **Unfortunately, the technology for these reactors is,** ¶ **for the most part, caught between the drawing board and** ¶ **production**. **Claims regarding the field utility and safety** ¶ **of various reactors are plausible, but authoritative evaluation will require substantial investment and technology** ¶ **demonstration**. **In the U.S. market, DOD could play an** ¶ **important role in this area.** **In the event that the U.S. small** ¶ **reactor industry succeeds without DOD support, the** ¶ **types of designs that emerge might not be useful for the** ¶ **department since some of the larger, more efficient designs** ¶ **that have greater appeal to private industry would not fit** ¶ **the department’s needs**. Thus, **there is significant incentive** ¶ **for DOD to intervene to provide a market, both to help** ¶ **the industry survive and to shape its direction**.¶ **Since the 1970s, in the U**nited **S**tates**, only the military has overcome the considerable barriers to building nuclear reactors. This will probably be the case with** ¶ **small reactors as well. If DOD leads as a first mover** ¶ **in this market—initially by providing analysis of costs,** ¶ **staffing, reactor lines, and security, and, when possible,** ¶ **by moving forward with a pilot installation—the new** ¶ **technology will likely survive and be applicable to** ¶ **DOD needs. If DOD does not, it is possible the technology will be unavailable in the future for either U.S.** ¶ **military or commercial use.**

#### SMRs deployable soon

U.S. Department of Commerce International Trade Administration 11

(“The Commercial Outlook for¶ U.S. Small Modular Nuclear¶ Reactors” <http://www.trade.gov/publications/pdfs/the-commercial-outlook-for-us-small-modular-nuclear-reactors.pdf>, SEH)

Although SMRs have significant potential and ¶ the market for their deployment is growing, their ¶ designs must still go through the technical and ¶ regulatory processes necessary to ensure that ¶ they can be safely and securely deployed. Lightwater technology–based SMRs may not be ready ¶ for deployment in the United States for at least ¶ a decade, and advanced designs might be even ¶ further off**.** **Light-water SMRs and SMRs that have** ¶ **undergone significant testing are the most likely** ¶ **candidates for near-term deployment, because** ¶ **they are most similar to existing reactors that** ¶ **have certified designs and significant operating** ¶ **histories**. NuScale is on track to submit its reactor ¶ design to the NRC by 2012, as is Babcock & Wilcox ¶ for its mPower design. In addition, GE-Hitachi, ¶ which already completed an NRC preapplication ¶ review for its PRISM reactor in 1994, plans to submit its PRISM design for certification in 2012. ¶ With fierce competition for commercial deployment of U.S. SMRs anticipated, the U.S. government is accelerating its efforts to support the ¶ licensing of new reactor designs. The fiscal year ¶ 2011 budget request for the Department of Energy ¶ includes $39 million for a program to support ¶ design certification of SMRs for commercial deployment, as well as a research and development ¶ portfolio that will address the technology development needs of both near- and longer-term SMRs. ¶ **The Department of Energy is also in discussions** ¶ **with several U.S. companies to facilitate the lightwater SMR design certification by the NRC within** ¶ **a reasonable timeframe.** The department also ¶ continues to support research and development ¶ efforts toward advanced reactor designs through ¶ the Advanced Reactor Concepts program, which ¶ focuses on metal-cooled reactor technologies.

#### Obama has pushed SMR policy not just budget

Kramer ‘12

(David J. Kramer was educated at Tufts University, receiving his B.A. in Soviet Studies and Political Science, and then at Harvard University, receiving his M.A. in Soviet Studies. “Romney, Obama surrogates spell out candidates’ energy policies” September 2012 Accessed online at <http://www.physicstoday.org/resource/1/phtoad/v65/i9/p20_s10>)

The Obama administration’s support for nuclear power is evident from the $7 billion loan guarantee from DOE to back construction of two new reactors at an existing nuclear power plant in Georgia, Reicher noted. “There’s serious money going into small modular reactors and serious policy work going on in how to reform the licensing process” at the Nuclear Regulatory Commission to expedite approval.