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#### Fiscal cliff compromise will pass but political capital is key

Kimberly Atkins 11-8, Boston Herald columnist, “Prez returns to D.C. with more clout,” 11/8/12, http://bostonherald.com/news/columnists/view/20221108prez\_returns\_to\_dc\_with\_more\_clout

When President Obama returned yesterday to the White House, he brought with him political capital earned in a tough re-election fight as well as a mandate from voters — which means bold changes and bruising fights could lie ahead. ¶ The first agenda item is already waiting for him: reaching an agreement with lawmakers to avert the looming fiscal cliff. GOP lawmakers have previously shot down any plan involving tax increases. Obama’s win — based in part on a message of making the wealthiest Americans pay more — may already be paying dividends.¶ In remarks at the Capitol yesterday, House Speaker John Boehner seemed to acknowledge the GOP has to take a different tack than the obstructionism that has marred progress in the past.¶ “The president has signaled a willingness to do tax reform with lower rates. Republicans have signaled a willingness to accept new revenue if it comes from growth and reform,” Boehner said. “Let’s start the discussion there.” ¶ Obama’s fresh political clout could extend to longer term fiscal policies beyond the fiscal cliff, though don’t expect GOP pushback to vanish. House Republicans still have plenty of fight in them. ¶ Comprehensive immigration reform — designed to smooth the path to citizenship while also strengthening the nation’s borders — also will be high on the president’s priority list. But unlike in his first term, when such a plan got little more than lip service in the face of staunch GOP opposition, Obama’s 3-to-1 support from Latinos on Election Day gives him the incentive to get it done. It also robs Republicans, who learned firsthand that dwindling support from Hispanics and other minority groups is costing them dearly, of any reason to stand in the way. ¶ An influx of new female voices in the Senate could also make Obama’s next four years the “Term of the Woman,” putting a new focus on equal pay and reproductive rights. ¶ U.S. Sen. Patty Murray of Washington state, who chairs the Democratic Senatorial Campaign Committee, told reporters yesterday that having a historically high 20 women in the Senate in January won’t just mean more attention to women’s issues. She said the Senate will function better overall with “great women who have really strong voices” on board, such as U.S. Sen.-elect Elizabeth Warren. “There is no stronger advocate for middle-class Americans,” Murray said of Warren. ¶ None of this, of course, will be a cakewalk, but unlike his first term, Obama will have more power to push back.

#### Plan’s massively controversial

Annie Snider 12, E&E reporter, 1/16/12, “Pentagon still can't define 'energy security,' much less achieve it,” http://www.eenews.net/public/Greenwire/2012/01/16/1

But this is not a good time to be requesting money at the Pentagon. ¶ Military budget planners have spent the past year carving nearly a half-trillion dollars in budget cuts, while top brass have worn out the thesaurus' list of synonyms for "decimate" as they decry the damage that additional looming cuts would do to their forces and weapons. ¶ At the same time, no one has yet made the business case for investing in energy security. Current rules require that renewable energy and efficiency projects prove they will bring savings over the long run, even if they carry an added security benefit. In fact, because the Pentagon operates on a five-year budget cycle, projects that pencil out to great investments over the long term often get turned down because they register to the budget as a near-term loss. ¶ Microgrids are still in the pilot phase and the military has not yet decided what the business model will be for them. Because the technology would help energy managers use power more efficiently on a day-to-day basis, for instance by bringing unnecessary loads offline during peak demand times, some officials say microgrids may be able to create enough savings to pay for themselves. Not all of industry is convinced, though, and a group of business executives will be suggesting financial models to Robyn's office in a report this spring. ¶ Ultimately, many say the military is going to have to decide what "secure energy" is worth to it if it wants to fix its vulnerabilities. ¶ "Until someone establishes the value of energy security, I only have the business case to rely on, because right now the value of energy security is apparently zero," said Dan Nolan, a retired Army colonel who writes a defense energy blog. ¶ The Navy has made a rough attempt to do this for its Surface Warfare Center in Dahlgren, Va. Like many military installations, the base sits at the end of the power line. Last year it lost electricity 11 times. ¶ Capt. Kenneth Branch, the commander for Naval Facilities Engineering Command Washington, estimates that the two days the center was without power during Hurricane Irene this summer cost it $60,000. ¶ "That's just lost industrial productivity," he said, noting that the numbers helped him justify infrastructure investments. "I also spend a lot of money on my labor trying to figure what were the problems and get back up and online." ¶ A fuller accounting could also count the costs associated with backup generators, including labor required for maintenance, the price of buying and transporting fuel, and the risk of failure. ¶ Pentagon officials say they are beginning to think through some of these calculations, but nobody is sure yet whether extra money would follow. ¶ "If the military is really serious about this, are we going to have to spend some dedicated funds on energy security?" the Army's Kidd said. "I don't know the answer to that, but I think those are the questions we need to start to ask." ¶ Looking to Congress¶ Ultimately, the answers to those questions will come from Capitol Hill, where lawmakers have been bitterly divided on energy policy. ¶ Indeed, a military energy issue that has become a symbol of the larger energy policy debate was one of the final points to be resolved in last month's congressional budget deal. Republicans mounted an effort to exempt the military from a 2007 ban on purchasing fuels like liquefied coal that have a higher greenhouse gas content than traditional petroleum, but in the end they acquiesced, leaving the ban intact.

#### Going over the fiscal cliff causes a second great depression

Morici 8/7 Peter, PhD, is a "recognized expert on economic policy and international economics." He is a Professor of International Business at the R.H. Smith School of Business at the University of Maryland. "Fix fiscal cliff now or face next Great Depression," 2012, http://www.foxnews.com/opinion/2012/08/07/fix-fiscal-cliff-now-or-face-next-great-depression/

President Obama and Republicans are engaging in dangerous brinksmanship. Putting off a political solution to the looming “fiscal cliff” until after the election **risks a** second Great Depression.¶ Without a compromise by January, $400 billion in mandatory spending cuts and more than $100 billion in tax increases will immediately go into effect. **With our economy only growing by only $300 billion annually, such a shock would thrust it into a prolonged contraction.**

#### Global economic crisis causes nuclear great-power war

Mead 9 – Walter Russell Mead, the Henry A. Kissinger Senior Fellow in U.S. Foreign Policy at the Council on Foreign Relations, 2-4, 2009, “Only Makes You Stronger,” The New Republic, http://www.tnr.com/politics/story.html?id=571cbbb9-2887-4d81-8542-92e83915f5f8&p=2

If current market turmoil seriously damaged the performance and prospects of India and China, the current crisis could join the Great Depression in the list of economic events that changed history, even if the recessions in the West are relatively short and mild. The United States should stand ready to assist Chinese and Indian financial authorities on an emergency basis--and work very hard to help both countries escape or at least weather any economic downturn. It may test the political will of the Obama administration, but the United States must avoid a protectionist response to the economic slowdown. U.S. moves to limit market access for Chinese and Indian producers could poison relations for years. For billions of people in nuclear-armed countries to emerge from this crisis believing either that the United States was indifferent to their well-being or that it had profited from their distress could damage U.S. foreign policy far more severely than any mistake made by George W. Bush.¶ It's not just the great powers whose trajectories have been affected by the crash. Lesser powers like Saudi Arabia and Iran also face new constraints. The crisis has strengthened the U.S. position in the Middle East as falling oil prices reduce Iranian influence and increase the dependence of the oil sheikdoms on U.S. protection. Success in Iraq--however late, however undeserved, however limited--had already improved the Obama administration's prospects for addressing regional crises. Now, the collapse in oil prices has put the Iranian regime on the defensive. The annual inflation rate rose above 29 percent last September, up from about 17 percent in 2007, according to Iran's Bank Markazi. Economists forecast that Iran's real GDP growth will drop markedly in the coming months as stagnating oil revenues and the continued global economic downturn force the government to rein in its expansionary fiscal policy.¶ All this has weakened Ahmadinejad at home and Iran abroad. Iranian officials must balance the relative merits of support for allies like Hamas, Hezbollah, and Syria against domestic needs, while international sanctions and other diplomatic sticks have been made more painful and Western carrots (like trade opportunities) have become more attractive. Meanwhile, Saudi Arabia and other oil states have become more dependent on the United States for protection against Iran, and they have fewer resources to fund religious extremism as they use diminished oil revenues to support basic domestic spending and development goals. None of this makes the Middle East an easy target for U.S. diplomacy, but thanks in part to the economic crisis, the incoming administration has the chance to try some new ideas and to enter negotiations with Iran (and Syria) from a position of enhanced strength. ¶ Every crisis is different, but there seem to be reasons why, over time, financial crises on balance reinforce rather than undermine the world position of the leading capitalist countries. Since capitalism first emerged in early modern Europe, the ability to exploit the advantages of rapid economic development has been a key factor in international competition. Countries that can encourage--or at least allow and sustain--the change, dislocation, upheaval, and pain that capitalism often involves, while providing their tumultuous market societies with appropriate regulatory and legal frameworks, grow swiftly. They produce cutting-edge technologies that translate into military and economic power. They are able to invest in education, making their workforces ever more productive. They typically develop liberal political institutions and cultural norms that value, or at least tolerate, dissent and that allow people of different political and religious viewpoints to collaborate on a vast social project of modernization--and to maintain political stability in the face of accelerating social and economic change. The vast productive capacity of leading capitalist powers gives them the ability to project influence around the world and, to some degree, to remake the world to suit their own interests and preferences. This is what the United Kingdom and the United States have done in past centuries, and what other capitalist powers like France, Germany, and Japan have done to a lesser extent. In these countries, the social forces that support the idea of a competitive market economy within an appropriately liberal legal and political framework are relatively strong.¶ But, in many other countries where capitalism rubs people the wrong way, this is not the case. On either side of the Atlantic, for example, the Latin world is often drawn to anti-capitalist movements and rulers on both the right and the left. Russia, too, has never really taken to capitalism and liberal society--whether during the time of the czars, the commissars, or the post-cold war leaders who so signally failed to build a stable, open system of liberal democratic capitalism even as many former Warsaw Pact nations were making rapid transitions. Partly as a result of these internal cultural pressures, and partly because, in much of the world, capitalism has appeared as an unwelcome interloper, imposed by foreign forces and shaped to fit foreign rather than domestic interests and preferences, many countries are only half-heartedly capitalist. When crisis strikes, they are quick to decide that capitalism is a failure and look for alternatives.¶ So far, such half-hearted experiments not only have failed to work; they have left the societies that have tried them in a progressively worse position, farther behind the front-runners as time goes by. Argentina has lost ground to Chile; Russian development has fallen farther behind that of the Baltic states and Central Europe. Frequently, the crisis has weakened the power of the merchants, industrialists, financiers, and professionals who want to develop a liberal capitalist society integrated into the world. Crisis can also strengthen the hand of religious extremists, populist radicals, or authoritarian traditionalists who are determined to resist liberal capitalist society for a variety of reasons. Meanwhile, the companies and banks based in these societies are often less established and more vulnerable to the consequences of a financial crisis than more established firms in wealthier societies.¶ As a result, developing countries and countries where capitalism has relatively recent and shallow roots tend to suffer greater economic and political damage when crisis strikes--as, inevitably, it does. And, consequently, financial crises often reinforce rather than challenge the global distribution of power and wealth. This may be happening yet again.¶ None of which means that we can just sit back and enjoy the recession. History may suggest that financial crises actually help capitalist great powers maintain their leads--but it has other, less reassuring messages as well. If financial crises have been a normal part of life during the 300-year rise of the liberal capitalist system under the Anglophone powers, so has war. The wars of the League of Augsburg and the Spanish Succession; the Seven Years War; the American Revolution; the Napoleonic Wars; the two World Wars; the cold war: The list of wars is almost as long as the list of financial crises.¶ Bad economic times can breed wars. Europe was a pretty peaceful place in 1928, but the Depression poisoned German public opinion and helped bring Adolf Hitler to power. If the current crisis turns into a depression, what rough beasts might start slouching toward Moscow, Karachi, Beijing, or New Delhi to be born?¶ The United States may not, yet, decline, but, if we can't get the world economy back on track, we may still have to fight.

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#### The United States Federal Government should substantially increase investment in smart microgrid technology for

#### Military bases in the United States

#### via a diverse portfolio tailored to individual installation circumstances, including non-nuclear renewable energies for on-site generation, increased backup generation capacity, improvements in energy efficiency and energy storage, intelligent local energy management, and accelerated implementation of the SPIDERS project.

#### Smart microgrids solve DOD grid vulnerability---the combination of the CP’s mechanisms resolves the problems with each individual component

SERDP 12 – the Strategic Environmental Research and Development Program, DoD’s environmental science and technology program, executed in partnership with DOE and EPA, 7/10/12, “DoD Study Finds Microgrids Offer Improved Energy Security for DoD Installations,” http://www.serdp.org/News-and-Events/News-Announcements/Program-News/DoD-study-finds-microgrids-offer-improved-energy-security-for-DoD-installations

Advanced microgrids offer a cost-effective solution to military installations' growing vulnerability to the fragile electric grid, according to a study released today by DoD’s Office of Installations and Environment. The study performed by MIT Lincoln Laboratory looked at different microgrid architectures and characteristics and compared their relative cost-effectiveness. The report provides insight into increasing energy security and reducing energy costs through the incorporation of renewable energy resources into microgrids, as well as new market opportunities for DoD in the area of demand response and ancillary services.

The study highlights the extent of ongoing microgrid work across DoD. It identified 44 installations that either had existing microgrids, planned installation of microgrids, or conducted microgrid studies or demonstrations at their facilities. The authors interviewed more than 75 people from the military Services, the Office of the Secretary of Defense, and the Department of Energy. The analysis categorized the ongoing microgrid efforts based on several key attributes including size, maturity, the inclusion of renewable resources, and the ability to operate in a grid-tied manner.

The analysis confirms the value of microgrids to DoD. The combination of on-site energy generation and storage, together with the microgrid’s ability to manage local energy supply and demand, allow installations to shed non-essential loads and maintain mission-critical loads if the electric grid is disrupted.

The report illustrates the largely untapped potential of moving to smarter, next generation microgrids that would accommodate far greater penetration of renewable energy sources, as well as tighter integration with the electrical grid. If solar resources that are increasingly being installed on DoD installations were available during islanded operation of a microgrid, they could significantly extend the islanding time. Moreover, a microgrid that could operate when tied to the grid would offer new opportunities for the DoD to generate cost savings by using backup generation assets during normal operation and generate financial revenue by using advanced ancillary services.

One important finding is that there will be no “one size fits all” solution. The location of a military installation influences the options available for energy generation sources, the options available for interaction with the local utility, the characteristics of the local electricity market, and the regulatory environment. The most effective microgrids will be those that take into account the needs of the local commercial electric grid and are configured so that they can earn value helping to meet those needs.

#### SPIDERS will produce effective renewable-based microgrids that guarantee communications and control survive grid outages

Robert K. Ackerman 12, SIGNAL Magazine, February 2012, “Military Energy Enters SPIDERS Web,” http://www.afcea.org/content/?q=node/2877

No man may be an island, but each U.S. military base may become an energy island if a joint project among the Department of Energy, the Department of Homeland Security and the Defense Department comes to fruition. The effort aims to develop a microgrid that would supply a base with internal power independent of any external source that might fail as a result of enemy action.

Network security would be a key element of this energy microgrid. Facing the possibility of a cyberattack on the nation’s power grid, military bases must be able to sustain internal power with a degree of immunity from the online tactics employed by cybermarauders.

This program also seeks to blend a host of conventional and alternative energy sources into a single entity that would respond seamlessly to internal base power demands. Complicating the endeavor to link these energy sources is the requirement to provide secure network control that could interoperate with the public power grid but still be immune to cyberthreats that menace the larger network.

Known as the Smart Power Infrastructure Demonstration for Energy Reliability and Security, or SPIDERS, the project is a Defense Department joint capability technology demonstration (JCTD). It already is underway at Joint Base Pearl Harbor-Hickam, Oahu, Hawaii, and later phases will evaluate progressively sophisticated systems at Fort Collins, Colorado, and Camp Smith, Hawaii.

Melanie Johnson, an electrical engineer with the Army Corps of Engineers Construction Engineering Research Laboratory, explains that SPIDERS is designed to develop a template for bringing microgrid technology to military installations in the United States. Its success would have implications for installations outside the United States, particularly in operational settings, she points out.

Part of the SPIDERS technical management team, Johnson explains that a key element in SPIDERS is to provide network security for the communications and control systems within that microgrid environment. That security would be vital if a base loses power because of a cyberattack on the local power grid.

What sets SPIDERS apart from other microgrid efforts is its emphasis on cybersecurity and network communications. Security is a primary SPIDERS objective, Johnson says, adding that this includes information assurance certification and implementing emerging standards from the National Institute of Standards and Technology (NIST), the North American Electric Reliability Corporation (NERC) and Department of Energy organizations.

Adding cybersecurity to the microgrid complicates the picture and requires “a little critical thinking,” Johnson observes. However, SPIDERS is not employing the traditional approach of first developing a control system and then overlaying security. Instead, security will be integrated into the system as it is developed. The result will be a comprehensive security solution that is tailored to the system, she offers.

The microgrid control system continually will monitor power quality and conditions in the regional power grid. If it detects instability or significant quality issues, it can alert monitors who would decide to disconnect the base from the external grid. The microgrid would continue to provide power to critical missions.

Johnson shares that planners are examining the relationship between the interface with the microgrid control system and the base’s enterprise network. Of particular interest is how that relationship would open the microgrid to vulnerabilities from outside the installation. Issues include the types of communications traffic that would be allowed in and out of the microgrid control system network.

According to its guidance, SPIDERS’ primary objectives are to protect task-critical assets from power loss due to cyberattack; integrate renewable and other distributed generational electricity to power task-critical assets in times of emergency; sustain critical operations during prolonged power outages; and manage installation electrical power consumption to reduce petroleum demand and carbon footprint.

SPIDERS will exploit existing energy assets such as solar arrays, wind generators and other renewable technologies as well as diesel generators to provide electricity more efficiently than if backup diesel generators alone were used. Renewable energy generators remain online constantly, providing electricity from alternate sources during opportune conditions such as windy or sunny days. Johnson points out, however, that most renewable energy resources trip offline when the main grid crashes. The microgrid allows the renewable power to stay online while maintaining necessary safety measures.

The program might tweak the bases’ energy sources by upgrading a legacy generator that lacks the necessary capacity, for example. Otherwise, it will focus on existing assets. Johnson emphasizes that SPIDERS will be energy-source agnostic.

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#### The United States Federal Government should enable a substantial increase in research and development of small modular reactor designs that have potential to contribute to Department of Defense energy security by the Advanced Research Projects Agency for Energy.

#### The United States Federal Government should require that energy sources procured by the Department of Defense be cost-competitive with existing energy sources.

#### Solves the case---ARPA-E can spark revolutionary energy breakthroughs---R&D for military-relevant tech spills over to DOD adoption and commercialization

Steven F. Hayward et al 10, Resident Scholar, American Enterprise Institute, October 2010, “POST-PARTISAN POWER: HOW A LIMITED AND DIRECT APPROACH TO ENERGY INNOVATION CAN DELIVER CLEAN, CHEAP ENERGY, ECONOMIC PRODUCTIVITY AND NATIONAL PROSPERITY,” http://thebreakthrough.org/blog/Post-Partisan%20Power.pdf

In addition to fostering stronger linkages between government-funded research centers and private sector investors, entrepreneurs, and customers, the DOD can work to more closely connect research efforts and the growing energy innovation needs of the U.S. military.

This close relationship between research efforts and DOD procurement and technology needs was central to the successful history of the Defense Advanced Research Projects Agency (DARPA), famous for inventing the Internet, GPS, and countless other technologies that have both improved the fighting capabilities of the U.S. military and launched many spin-off technologies American consumers and businesses now take for granted. DARPA program managers had a keen awareness of the technologies and innovations that could improve military capabilities and funded breakthrough innovations aligned with those needs. Once innovations matured into potentially useful technologies, the DOD was there as an early customer for these products, allowing entrepreneurial firms to secure market demand, scale-up production, and continue to improve their products.

Congress made the right move in creating and funding an Advanced Research Projects Agency for Energy (ARPA-E) program modeled after the historic success of DARPA. ARPA-E resides within the DOE, however, which is not set up to be a major user of energy technologies. By contrast, DOD has both the opportunity and the urgent need to use many of these technologies. 64 The DOD can and should play a greater role in administering ARPA-E and making sure that breakthrough energy discoveries become realworld technologies that can strengthen American energy security, enhance the capabilities of the U.S. military, and spin off to broader commercial use.

Fiscal year 2011 funding requests for the ARPA-E program are currently a modest $300 million, just onetenth the annual budget for DARPA research. 65 Truly bringing the DARPA model to the energy sector would imply scaling ARPA-E up to match DARPA. Given the multi-trillion dollar scale of the energy industry, only funding levels on this order of magnitude will have a significant impact on the pace of energy innovation and entrepreneurship.

We recommend scaling up funding for ARPA-E over the next five years to $1.5 billion annually, with a significant portion of this funding dedicated to dual-use energy technology innovations with the potential to enhance energy security and strengthen the U.S. military. DOD and DOE should extend and expand their current Memorandum of Understanding, established in July 2010, 66 and launch an active partnership between ARPA-E and DOD to determine and select nascent dual-use breakthrough energy innovations for funding through the ARPA-E program and potential adoption and procurement by the DOD.

#### Clearly avoids the defense budget DA---ARPA-E is a Department of Energy office.

Avoids politics---ARPA-E funding for SMRs avoids politics/elections (because both Obama and Romney support it)

William B. Bonvillian 12, director of the MIT Washington Office and former senior policy advisor in the U.S. Senate, teaches innovation policy and energy technology courses on the adjunct faculties at Georgetown University and Johns Hopkins-SAIS; and Richard Van Atta, former assistant deputy under secretary at the Department of Defense, is with the Institute for Defense Analyses and teaches security studies on the adjunct faculty at Georgetown University, March 2012, “The Energy Technology Challenge: Comparing the DARPA and ARPA-E Models,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, http://bipartisanpolicy.org/sites/default/files/Energy%20Innovation%20at%20DoD.pdf

Support community. ARPA-E faced a major funding challenge in FY2011, when a change in political control of the House of Representatives and growing concerns over spiraling federal deficits led to cutbacks in federal agency funding. As noted, because ARPA-E received no funding in FY2010 (it received two years of initial funding in FY2009 through stimulus legislation), it needed affirmative legislation to survive. As a result of the good will that had been built in its first two years of operation, a community of support began to collect around ARPA-E to independently advocate for the agency’s future with congressional committees, including VC firms, large and small firms that worked with ARPA-E, and universities, all enamored of its research model.

In summary, not only has ARPA-E proven a strong substantive success to date from a public policy perspective, but a political support base appears to be emerging that could help sustain it over time. ARPA-E could be in a position to achieve that rare combination, an integrated political design model, marrying political support with sound substance.

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#### The DOD budget’s focused on the Asia pivot now---new tradeoffs collapse the whole thing

Todd Harrison 12, Center for Strategic and Budgetary Priorities, 8/24/2012, ANALYSIS OF THE FY 2013 DEFENSE BUDGET AND SEQUESTRATION, http://www.csbaonline.org/wp-content/uploads/2012/08/Analysis-of-the-FY-2013-Defese-Budget.pdf

The Fiscal Year (FY) 2013 defense budget currently being debated in Congress is a departure from previous budgets in several respects. It is the first budget submitted following the release of the Pentagon’s new strategic guidance, marking the beginning of a “pivot” from the wars of the past decade to the Asia-Pacific region. It is also the first budget request in more than a decade to propose a real decline in defense spending from the level currently enacted. Moreover, the prospect of sequestration hangs over the budget, threatening to cut some 10 percent of funding if Congress does not act to prevent it. Secretary of Defense Leon Panetta has argued that the budget request is a “complete package,” that “there is little room here for significant modification,” and that any further funding reductions, such as those called for by sequestration, would require the Department to fundamentally rethink its new strategy.1 Nevertheless, the FY 2013 request is unlikely to survive unscathed and the Department will likely be forced to revise its strategic guidance.

#### SMRs are incredibly costly---far more than current reactors

Arjun Makhijani 10, President of the Institute for Energy & Environmental Research, Ph.D. in engineering (specialization: nuclear fusion) from the University of California at Berkeley; and Michele Boyd, former director of the Safe Energy Program at Physicians for Social Responsibility, September 2010, “Small Modular Reactors,” http://www.psr.org/nuclear-bailout/resources/small-modular-reactors-no.pdf

SMR proponents claim that small size will enable mass manufacture in a factory, enabling considerable savings relative to field construction and assembly that is typical of large reactors. In other words, modular reactors will be cheaper because they will be more like assembly line cars than hand-made Lamborghinis. In the case of reactors, however, several offsetting factors will tend to neutralize this advantage and make the costs per kilowatt of small reactors higher than large reactors. First, in contrast to cars or smart phones or similar widgets, the materials cost per kilowatt of a reactor goes up as the size goes down. This is because the surface area per kilowatt of capacity, which dominates materials cost, goes up as reactor size is decreased. Similarly, the cost per kilowatt of secondary containment, as well as independent systems for control, instrumentation, and emergency management, increases as size decreases. Cost per kilowatt also increases if each reactor has dedicated and independent systems for control, instrumentation, and emergency management. For these reasons, the nuclear industry has been building larger and larger reactors in an effort to try to achieve economies of scale and make nuclear power economically competitive.

Proponents argue that because these nuclear projects would consist of several smaller reactor modules instead of one large reactor, the construction time will be shorter and therefore costs will be reduced. However, this argument fails to take into account the implications of installing many reactor modules in a phased manner at one site, which is the proposed approach at least for the United States. In this case, a large containment structure with a single control room would be built at the beginning of the project that could accommodate all the planned capacity at the site. The result would be that the first few units would be saddled with very high costs, while the later units would be less expensive. The realization of economies of scale would depend on the construction period of the entire project, possibly over an even longer time span than present largereactor projects. If the later-planned units are not built, for instance due to slower growth than anticipated, the earlier units would likely be more expensive than present reactors, just from the diseconomies of the containment, site preparation, instrumentation and control system expenditures. Alternatively, a containment structure and instrumentation and control could be built for each reactor. This would greatly increase unit costs and per kilowatt capital costs. Some designs (such as the PBMR) propose no secondary containment, but this would increase safety risks.

These cost increases are unlikely to be offset even if the entire reactor is manufactured at a central facility and some economies are achieved by mass manufacturing compared to large reactors assembled on site. Furthermore, estimates of low prices must be regarded with skepticism due to the history of past cost escalations for nuclear reactors and the potential for cost increases due to requirements arising in the process of NRC certification. Some SMR designers are proposing that no prototype be built and that the necessary licensing tests be simulated. Whatever the process, it will have to be rigorous to ensure safety, especially given the history of some of proposed designs.

#### Causes tradeoffs that wreck the budget

Jack Spencer 11, Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation, 6/22/11, “Capability, Not Politics, Should Drive DOD Energy Research,” http://www.heritage.org/research/reports/2011/06/capability-not-politics-should-drive-dod-energy-research

With multiple wars ongoing, traditional threats looming, and new ones emerging, the U.S. Armed Forces are already under tremendous stress. So introducing a new assignment that needlessly bleeds scarce resources away from core missions to advance a political agenda is untenable. Yet this is exactly what the Obama Administration is doing by ordering the military to lead a green revolution.

The White House is pushing the idea that the alternative energy industry would get the kick start it needs if the military will just commit to using them. But the assumptions behind this argument are flawed, and the strategy would increase demands on the military budget while harming national security. Congress should put a stop to it right away.

#### Budget tradeoffs undermine the U.S. pivot to Asia---nuclear war

Colby 11 – Elbridge Colby, research analyst at the Center for Naval Analyses, served as policy advisor to the Secretary of Defense’s Representative to the New START talks, expert advisor to the Congressional Strategic Posture Commission, August 10, 2011, “Why the U.S. Needs its Liberal Empire,” The Diplomat, online: http://the-diplomat.com/2011/08/10/why-us-needs-its-liberal-empire/2/?print=yes

But the pendulum shouldn’t be allowed to swing too far toward an incautious retrenchment. For our problem hasn’t been overseas commitments and interventions as such, but the kinds of interventions. The US alliance and partnership structure, what the late William Odom called the United States’ ‘liberal empire’ that includes a substantial military presence and a willingness to use it in the defence of US and allied interests, remains a vital component of US security and global stability and prosperity. This system of voluntary and consensual cooperation under US leadership, particularly in the security realm, constitutes a formidable bloc defending the liberal international order.¶ But, in part due to poor decision-making in Washington, this system is under strain, particularly in East Asia, where the security situation has become tenser even as the region continues to become the centre of the global economy.¶ A nuclear North Korea’s violent behaviour threatens South Korea and Japan, as well as US forces on the peninsula; Pyongyang’s development of a road mobile Intercontinental Ballistic Missile, moreover, brings into sight the day when North Korea could threaten the United States itself with nuclear attack, a prospect that will further imperil stability in the region.¶ More broadly, the rise of China – and especially its rapid and opaque military build-up – combined with its increasing assertiveness in regional disputes is troubling to the United States and its allies and partners across the region. Particularly relevant to the US military presence in the western Pacific is the development of Beijing’s anti-access and area denial capabilities, including the DF-21D anti-ship ballistic missile, more capable anti-ship cruise missiles, attack submarines, attack aircraft, smart mines, torpedoes, and other assets.¶ While Beijing remains a constructive contributor on a range of matters, these capabilities will give China the growing power to deny the United States the ability to operate effectively in the western Pacific, and thus the potential to undermine the US-guaranteed security substructure that has defined littoral East Asia since World War II. Even if China says today it won’t exploit this growing capability, who can tell what tomorrow or the next day will bring?¶ Naturally, US efforts to build up forces in the western Pacific in response to future Chinese force improvements must be coupled with efforts to engage Beijing as a responsible stakeholder; indeed, a strengthened but appropriately restrained military posture will enable rather than detract from such engagement. ¶ In short, the United States must increase its involvement in East Asia rather than decrease it. Simply maintaining the military balance in the western Pacific will, however, involve substantial investments to improve US capabilities. It will also require augmented contributions to the common defence by US allies that have long enjoyed low defence budgets under the US security umbrella. This won’t be cheap, for these requirements can’t be met simply by incremental additions to the existing posture, but will have to include advances in air, naval, space, cyber, and other expensive high-tech capabilities.¶ Yet such efforts are vital, for East Asia represents the economic future, and its strategic developments will determine which country or countries set the international rules that shape that economic future. Conversely, US interventions in the Middle East and, to a lesser degree, in south-eastern Europe have been driven by far more ambitious and aspirational conceptions of the national interest, encompassing the proposition that failing or illiberally governed peripheral states can contribute to an instability that nurtures terrorism and impedes economic growth. Regardless of whether this proposition is true, the effort is rightly seen by the new political tide not to be worth the benefits gained. Moreover, the United States can scale (and has scaled) back nation-building plans in Iraq, Afghanistan, and the Balkans without undermining its vital interests in ensuring the free flow of oil and in preventing terrorism.¶ The lesson to be drawn from recent years is not, then, that the United States should scale back or shun overseas commitments as such, but rather that we must be more discriminating in making and acting upon them. A total US unwillingness to intervene would pull the rug out from under the US-led structure, leaving the international system prey to disorder at the least, and at worst to chaos or dominance by others who could not be counted on to look out for US interests.¶ We need to focus on making the right interventions, not forswearing them completely. In practice, this means a more substantial focus on East Asia and the serious security challenges there, and less emphasis on the Middle East. ¶ This isn’t to say that the United States should be unwilling to intervene in the Middle East. Rather, it is to say that our interventions there should be more tightly connected to concrete objectives such as protecting the free flow of oil from the region, preventing terrorist attacks against the United States and its allies, and forestalling or, if necessary, containing nuclear proliferation as opposed to the more idealistic aspirations to transform the region’s societies. ¶ These more concrete objectives can be better met by the more judicious and economical use of our military power. More broadly, however, it means a shift in US emphasis away from the greater Middle East toward the Asia-Pacific region, which dwarfs the former in economic and military potential and in the dynamism of its societies. The Asia-Pacific region, with its hard-charging economies and growing presence on the global stage, is where the future of the international security and economic system will be set, and it is there that Washington needs to focus its attention, especially in light of rising regional security challenges. ¶ In light of US budgetary pressures, including the hundreds of billions in ‘security’ related money to be cut as part of the debt ceiling deal, it’s doubly important that US security dollars be allocated to the most pressing tasks – shoring up the US position in the most important region of the world, the Asia-Pacific. It will also require restraint in expenditure on those challenges and regions that don’t touch so directly on the future of US security and prosperity. ¶ As Americans debate the proper US global role in the wake of the 2008 financial crisis and Iraq and Afghanistan, they would do well to direct their ire not at overseas commitments and intervention as such, but rather at those not tied to core US interests and the sustainment and adaptation of the ‘liberal empire’ that we have constructed and maintained since World War II.¶ Defenders of our important overseas links and activities should clearly distinguish their cause from the hyperactive and barely restrained approach represented by those who, unsatisfied with seeing the United States tied down in three Middle Eastern countries, seek intervention in yet more, such as Syria. Indeed, those who refuse to scale back US interventions in the Middle East or call for still more are directly contributing to the weakening of US commitments in East Asia, given strategic developments in the region and a sharply constrained budgetary environment in Washington.¶ We can no longer afford, either strategically or financially, to squander our power in unnecessary and ill-advised interventions and nation-building efforts. The ability and will to intervene is too important to be so wasted.

## DOD Advantage

### Grid---Squo Solves---General

#### Status quo solves grid cyber vulnerability

Paul Clark 12, MA Candidate, Intelligence/Terrorism Studies, American Military University; Senior Analyst, Chenega Federal Systems, 4/28/12, “The Risk of Disruption or Destruction of Critical U.S. Infrastructure by an Offensive Cyber Attack,” http://blog.havagan.com/wp-content/uploads/2012/05/The-Risk-of-Disruption-or-Destruction-of-Critical-U.S.-Infrastructure-by-an-Offensive-Cyber-Attack.pdf

An attack against the electrical grid is a reasonable threat scenario since power systems are "a high priority target for military and insurgents" and there has been a trend towards utilizing commercial software and integrating utilities into the public Internet that has "increased vulnerability across the board" (Lewis 2010). Yet the increased vulnerabilities are mitigated by an increased detection and deterrent capability that has been "honed over many years of practical application" now that power systems are using standard, rather than proprietary and specialized, applications and components (Leita and Dacier 2012). The security of the electrical grid is also enhanced by increased awareness after a smart-grid hacking demonstration in 2009 and the identification of the Stuxnet malware in 2010: as a result the public and private sector are working together in an "unprecedented effort" to establish robust security guidelines and cyber security measures (Gohn and Wheelock 2010).

### Grid---Squo Solves---Islanding---1NC

#### Squo solves islanding---the military adapted

Michael Aimone 9-12, Director, Business Enterprise Integration, Office of the Deputy Under Secretary of Defense (Installations and Environment), 9/12/12, Statement Before the House Committee on Homeland Security, Subcommittee on Cybersecurity, Infrastructure Protection and Security Technologies, http://homeland.house.gov/sites/homeland.house.gov/files/Testimony%20-%20Aimone.pdf

DoD’s facility energy strategy is also focused heavily on grid security in the name of mission assurance. Although the Department’s fixed installations traditionally served largely as a platform for training and deployment of forces, in recent years they have begun to provide direct support for combat operations, such as unmanned aerial vehicles (UAVs) flown in Afghanistan from fixed installations here in the United States. Our fixed installations also serve as staging platforms for humanitarian and homeland defense missions. These installations are largely dependent on a commercial power grid that is vulnerable to disruption due to aging infrastructure, weather-related events, and potential kinetic, cyber attack. In 2008, the Defense Science Board warned that DoD’s reliance on a fragile power grid to deliver electricity to its bases places critical missions at risk.1 ¶ Standby Power Generation ¶ Currently, DoD ensures that it can continue mission critical activities on base largely through its fleet of on-site power generation equipment. This equipment is connected to essential mission systems and automatically operates in the event of a commercial grid outage. In addition, each installation has standby generators in storage for repositioning as required. Facility power production specialists ensure that the generators are primed and ready to work, and that they are maintained and fueled during an emergency. With careful maintenance these generators can bridge the gap for even a lengthy outage. As further back up to this installed equipment, DoD maintains a strategic stockpile of electrical power generators and support equipment that is kept in operational readiness. For example, during Hurricane Katrina, the Air Force transported more than 2 megawatts of specialized diesel generators from Florida, where they were stored, to Keesler Air Force Base in Mississippi, to support base recovery.

### Islanding Not Key

#### Full islanding not key---DOD doesn’t want it

Annie Snider 12, E&E reporter, 1/16/12, “Pentagon still can't define 'energy security,' much less achieve it,” http://www.eenews.net/public/Greenwire/2012/01/16/1

Some argue that all military facilities should be able to operate off the grid for an unlimited period of time, a concept called "islanding." But full islanding has fallen out of favor with most Pentagon officials, who say that even with such capabilities, a base would not be able to operate for long if its neighbors were devastated, at minimum because most service members live with their families off-base.

"If the grid is down for days and everything in the nearby town is out, but you've got a lit up base -- what kind of message does that send?" asked Kevin Geiss, deputy assistant secretary for energy for the Air Force. "We either need to be prepared to figure out how we can also support outside the fence, or maybe that's not the solution."

Geiss argues that the focus should be on building a system that lets the most important missions stay up for as long as necessary, while letting go of lower-priority missions during outages. The Defense Science Board also took this tack and included a classified appendix to its report that lists facilities where the board believed building this limited form of islanding is most important.

What this would actually mean depends on the installation. Sites focused on training may be able to stay offline for a while, but facilities involved with battlefield missions like drone flights or real-time intelligence analysis likely cannot afford a gap. It would also depend on the circumstances surrounding the outage. During a natural disaster like Hurricane Katrina, for instance, facilities that would not normally be prioritized could become critical as regional relief centers.

"If all I could produce is 20 megawatts, I want to be able to do that 20 megawatts at the most important facility on the installation at that time," said Coby Jones, who manages the energy program at the Army's Fort Bragg in North Carolina.

"The situation and the mission determine what buildings are critical," he explained. "If it's just a natural disaster, different facilities are more important than others. If it is a military situation or mission that's going on, it's other facilities that need to have power to them. It's hard to put your finger on which building is most important and how to define that, because it is a sliding scale."

### AT: Alaska

#### Alaskan utilities operate independently---solves the adv

WM Warwick 10, Pacific Northwest National Laboratory, September 2010, “Renewable Resource Development on Department of Defense Bases in Alaska: Challenges and Opportunities,” <http://www.pnl.gov/main/publications/external/technical_reports/PNNL-19742.pdf>

The electrical system in Alaska is primitive in comparison to that in the lower 48 states and the rest of the developed world because of the harsh climate, large land mass and sparse population. There are two major population centers in the state, Anchorage and Fairbanks, and a cluster of smaller towns scattered across the Kenai Peninsula (see Figure 2). All three areas are linked by a single transmission circuit that is about 600 miles long. It follows the major railroad and highway linking these areas and is therefore called the Railbelt transmission system. Power exchanges along the system are limited primarily as a consequence of the nature of electricity requirements in the state and the associated history of each utility. The climate in Alaska is so harsh that a power outage of any duration can be devastating. As a result, each utility has planned to be able to operate independently of all others. They also plan to have sufficient reserve generating capacity to be able to provide power even if multiple generators are inoperable. The end result is sufficient generating capability to offset the need for integrated operations, and therefore, the need for an extensive transmission system (see Figure 3, from Doyon Utilities).

#### Their Pickett ev says Alaksa’s vulnerable because its utilities are broke---obviously that means they don’t have money to build SMRs

Robert M. Pickett 8, Chairman, Regulatory Commission of Alaska, 12/8/8, “Electric Utility Regulation in Alaska,” http://www.lawseminars.com/materials/08ENAK/enak%20m%206%20Pickett%2011-14.doc

This ends my brief overview of the regulatory environment for Alaska’s electric utilities. Now, let’s look forward. With the numerous challenges currently confronting the industry, it is important to reflect upon the physical and organizational realities of the State’s electric utilities. Alaska’s electrical energy infrastructure is very different than the electrical energy systems in most of the United States. Our main electrical energy grid only serves South-central Alaska and the Fairbanks area. Most of the 120 certificated electric utilities are in small, isolated communities with limited back-up options, facing extreme environmental challenges. Many of the remote areas of Alaska are also experiencing a population out-migration, which raises issues relating to a sustainable customer base for the utilities. This is a daunting business environment for any utility to successfully operate in

#### Alaskan SMRs would take forever

Gwen Holdmann 11, Director, Alaska Center for Energy and Power, University of Alaska-Fairbanks, March 2011, “Small Scale Modular Nuclear Power: an option for Alaska?,” <http://www.uaf.edu/files/acep/Executive-Summary-3-2-11.pdf>

The purpose of this report is to explore the viability of SMR technology for meeting Alaska’s current and future energy needs. We found that no small-scale nuclear reactor technology is currently approved or licensed for commercial use in the U.S. In fact, no SMR manufacturers have submitted a request for design review and certification to the Nuclear Regulatory Commission (NRC), a critical step toward development of a pilot project and a process that is expected to take several years to complete. Therefore, at least with regard to any SMR that could be installed in the U.S., this technology is still in a pre-commercial phase of development. Nonetheless, several manufacturers are actively advancing their designs, and the Department of Energy (DOE) is poised to invest $500 million in SMR technology over the next few years. The question is not whether SMRs will become commercially available, but when. In the interim, a series of questions need to be answered, some at the national level and some in Alaska. These questions include, Does the technology exist to build these small reactors? Is the technology safe? How will the fuel cycle for SMRs be managed? Are suppliers willing to sell small-scale nuclear reactors in Alaska? Who would own a project? Would this technology be cost effective? What skills are needed if Alaskans choose to adopt SMR technology as part of their energy portfolio? Should Alaska be an early adopter of this technology?

This study, conducted at the request of the Alaska Legislature and managed through the Alaska Energy Authority (AEA), addresses these questions. The scope of this report includes identification and evaluation of all currently known existing or proposed small-scale nuclear power technologies worldwide. Information contained in this report was obtained through web-based and library research, interviews with technology experts worldwide, and attendance at conferences focused on SMR technology.

In addition, many of the policy options forwarded in this report are a direct product of discussions that took place during a SMR workshop held in Anchorage involving dozens of key stakeholders from around the state, as well as representatives from the DOE Nuclear Energy Agency, the Nuclear Regulatory Commission, and other industry specialists. This workshop specifically considered Alaska applications for SMR technology, including the special challenges associated with potential deployment in Alaska. We thank those who took the time to participate and contribute to that discussion. A full transcript is available.1

The results of our study of current SMR technologies include the following observations:

• More than 50 nuclear reactor technologies have been proposed worldwide that are classified as small. These nuclear reactors vary in size from 1 MWe to 300 MWe. Many of the newer designs are “fast reactors” as opposed to currently used “light water reactor” technology. Fast reactors are designed to allow the use of spent fuel from light water reactors, but doing so requires the development and construction of expensive fuel reprocessing plants that do not yet exist.

• No SMR systems are expected to be in service before 2020. The first systems approved by the NRC will likely be smaller-scale versions of existing light water reactor technology, such as those proposed by NuScale and Babcock and Wilcox.

• All of the current SMR designs for which NRC approval will be sought are 10 MWe or larger, a size too large for most rural communities. Radioisotope thermal generators (RTGs), used by NASA for long-term space missions or on Earth for powering critical remote communications sites, are unsuitable for village-scale power due to the high cost of radioisotope materials. Mini nuclear reactor systems that might be suitable for small communities have not been considered seriously because of the lack of an apparent U.S. market. Nuclear submarines and icebreakers use highly enriched (weapons grade) uranium that would pose safety and security issues if used for stationary power.

#### No Arctic War

Bartsch 12 (Golo, Associate at Ecologic Institute, “Arctic Security”, 7/30, http://arcticsummercollege.org/sites/default/files/Security%20Policy%20Brief\_Arctic%20Summer%20College\_July%2030%202012\_0.pdf)

As the Russian flag was planted underneath the North Pole in 2007, media predicted an uncontrolled “gold rush” or even a “new Cold War” in the region. This interpretation of military presence in the North, in combination with diminishing sea ice and territorial and resource claims of the riparian nations, created the image of imminent conflict. In fact, the probability of armed conflict in the North was not significantly higher during the last years than it was from 1990 to 2007. The nations involved, especially the Arctic Five, are affiliated with several overlapping international institutions, such as the United Nations or the Arctic Council, which provide arenas for peaceful conflict management. Furthermore, all those nations are aware that any armed escalation is counterproductive to their future interests and to exploitation of Arctic resources. In the official Northern strategies or White Papers of the Arctic Five, the commitment to peaceful cooperation and compliance with international law is a common and fundamental element. The current deployment, modernization, and reorganisation of the military in the Arctic takes place mostly to support the constabulary functions of those forces: Due to the harsh conditions of weather and terrain, it is foremost the military which has the equipment and personnel capacities to operate in the North at all. This includes not only the sovereign rights of border patrolling, coast guarding, and air policing, but also the provision of Search-and-Rescue (SAR) capabilities. Since an SAR agreement has been negotiated through the Arctic Council during the Conference of Nuuk in 2011, this task is of particular importance.

#### The US would win anyway – no escalation – their evidence is just media hype

**Axe 11** (David, Military Correnspondent @ WIRED, Washington Times, " How the U.S. Wins the Coming Arctic War," Jan 11th, http://www.wired.com/dangerroom/2011/01/how-the-u-s-wins-the-coming-arctic-war/, EMM)

The strategic implications of steadily melting Arctic ice. It’s [is] one of those perennial stories of the U.S. defense trade, alongside “the end of U.S. air supremacy,” “cyber Pearl Harbor” and “China conquers the world.” The story always starts and ends the same way. Up top, how global climate change will, by 2015 or so, result in ice-free Arctic summers — allowing shipping and oil and natural-gas extraction. At the bottom, how the U.S. isn’t doing enough to secure its slice of the Arctic pie. I should know: in weaker moments, I’ve written this tale, too. But these tales, my versions included, usually omit two vital points: that Arctic conflict is unlikely to occur at all; and even if it does, the U.S. will have an overwhelming advantage over any rival. The Washington Post was the latest to repeat the Arctic-war theme, in a story published yesterday. “The Arctic is believed to hold nearly a quarter of the world’s untapped natural resources and a new passage could shave as much as 40 percent of the time it takes for commercial shippers to travel from the Atlantic to the Pacific,” Jacquelyn Ryan wrote. But, she added, “government and military officials are concerned the United States is not moving quickly enough to protect American interests in this vulnerable and fast-changing region.” Specifically, the U.S. does not have enough icebreakers or permanent bases on the Alaskan north slope. Canada and Russia, by contrast, are buying ice-hardened Arctic ships and building new facilities to enforce their Arctic claims, Ryan pointed out. The thing is, it’s not icebreakers and patches of wind-blasted tarmac that would really matter in some future North Pole showdown. In the Arctic, as in any sea battle, American nuclear attack submarines — quiet, versatile and lethal — would make all the difference. U.S. subs have been sneaking around under the Arctic ice, and occasionally surfacing, for decades. Today, they even carry geologists and other scientists in order to help map Arctic mineral deposits. “In addition to being more heavily armed than most foreign boats, U.S. submarines generally have superior quieting and combat systems, better-trained crewmen, and much more rigorous maintenance standards,” Bob Work wrote in 2008, before becoming Navy undersecretary. “As a result, the U.S. submarine force has generally been confident that it could defeat any potential undersea opponent, even if significantly outnumbered.” But in the Arctic, facing only the Canadians, Russians, Danes and Norwegians — none of whom have large or healthy sub fleets — the U.S. Navy’s 50 Los Angeles-, Seawolf- and Virginia-class subs would be more numerous as well as more powerful. And besides, an Arctic war is highly unlikely, at best. “Militarized conflict over the Arctic is unlikely, and regional disputes are unlikely to cause an overall deterioration in relations between or among polar nations,” the Carnegie Endowment for International Peace concluded in a 2009 conference. “Security issues should not be sensationalized in order to attract attention towards the Arctic.” But it’s rare anyone writes stories about how we’ve got enough weapons — and don’t really need them, besides. After all, it’s the sensational stories about shortages and looming disaster that sell newspapers**.**

### AT: Cyber Attacks---Not Likely

#### The grid is air-gapped

Michael Tanji 10, spent 20 years in the US intelligence community; veteran of the US Army; served in strategic and tactical assignments worldwide; participated in national and international analysis and policy efforts for the NIC, NSC and NATO; Claremont Institute Lincoln Fellow and Senior Fellow at the Center of Threat Awareness; lectures on intelligence issues at The George Washington University, 7/13/10, “Hacking the Electric Grid? You and What Army?,” http://www.wired.com/dangerroom/2010/07/hacking-the-electric-grid-you-and-what-army/

Grid-hacking is back in the news, with the unveiling of “Perfect Citizen,” the National Security Agency’s creepily named effort to protect the networks of electrical companies and nuclear power plants.

People have claimed in the past to be able to turn off the internet, there are reports of foreign penetrations into government systems, “proof” of foreign interest in attacking U.S. critical infrastructure based on studies, and concerns about adversary capabilities based on allegations of successful critical infrastructure attacks. Which begs the question: If it’s so easy to turn off the lights using your laptop, how come it doesn’t happen more often?

The fact of the matter is that it isn’t easy to do any of these things. Your average power grid or drinking-water system isn’t analogous to a PC or even to a corporate network. The complexity of such systems, and the use of proprietary operating systems and applications that are not readily available for study by your average hacker, make the development of exploits for any uncovered vulnerabilities much more difficult than using Metasploit.

To start, these systems are rarely connected directly to the public internet. And that makes gaining access to grid-controlling networks a challenge for all but the most dedicated, motivated and skilled — nation-states, in other words.

### Unilateralism DA---1NC

#### DOD pursuit of SMRs sends a global signal of impending U.S. military aggression---causes resentment against U.S. unilateralism

Terrence P. Smith 11, program coordinator and research assistant with the William E. Simon Chair in Political Economy at the CSIS, February 16, 2011, “An Idea I Can Do Without: “Small Nuclear Reactors for Military Installations,”” http://csis.org/blog/idea-i-can-do-without-small-nuclear-reactors-military-installations

The report repeatedly emphasizes the point that “DOD’s “’first mover’ pursuit of small reactors could have a profound influence on the development of the industry,” and cautions that “if DOD does not support the U.S. small reactor industry, the industry could be dominated by foreign companies.” The U.S. nonproliferation agenda, if there is one, stands in opposition to this line of thinking. Pursuing a nuclear technology out of the fear that others will get it (or have it), is what fueled the Cold War and much of the proliferation we have seen and are seeing today. It is a mentality I think we should avoid.

I do not mean to say this report ignores the risks. In fact they explicitly say, “We acknowledge that there are many uncertainties and risks associated with these reactors.” For example it says,

Some key issues that require consideration include securing sealed modules, determining how terrorists might use captured nuclear materials, carefully considering the social and environmental consequences of dispersing reactors.

The report also points out that “from a financial perspective, small reactors represent substantial losses in economies of scale.”

These issues, which were briefly mentioned, hardly seem like small potatoes. The reports answer to the issues raised: “making reliable projections about these reactors’ economic and technical performance while they are still on paper is a significant challenge,” and “Nevertheless, no issue involving nuclear energy is simple.”

On the other hand, the report argues, “failing to pursue these technologies raises its own set of risks for DOD.” “First, small reactors may fail to be commercialized in the United States; second, the designs that get locked in by the private market may not be optimal for DOD’s needs; and third, expertise on small reactors may become concentrated in foreign countries.”

Yes these are important issue for a business stand, but I don’t find them to be the primary concern.

The reactors are purely for energy purposes, but in a world that seems to be growing tired of U.S. military intervention, the idea of ensuring our ability to do so through the proliferation of mobile nuclear reactors will hardly quell any hostile sentiment. In addition, it can only add fire to the “nuclear = good” flame. So, while even under best case scenario, the reactors are completely proliferation proof and pose no direct threat to the nonproliferation cause (ignoring the spreading of nuclear tech and knowledge in general), I have a tough time seeing how it helps.

The report concludes that the DoD “should seriously consider taking a leadership role on small reactors.” Since the 1970s, the report says, “in the United States, only the military has overcome the considerable barriers to building nuclear reactors. This will probably be the case with small reactors as well.” For now, the plans for small nuclear reactors are “unfortunately,” for the most part, “caught between the drawing board and production.”

My point is, maybe that is where they should stay.

#### The U.S. is pursuing a grand strategy of multilateral legitimacy now---perception of a swing back toward unilateral military primacy collapses heg

Kevin Fujimoto 12, Lt. Colonel, U.S. Army, January 11, 2012, “Preserving U.S. National Security Interests Through a Liberal World Construct,” online: <http://www.strategicstudiesinstitute.army.mil/index.cfm/articles/Preserving-US-National-Security-Interests-Liberal-World-Construct/2012/1/11>

The emergence of peer competitors, not terrorism, presents the greatest long-term threat to our national security. Over the past decade, while the United States concentrated its geopolitical focus on fighting two land wars in Iraq and Afghanistan, China has quietly begun implementing a strategy to emerge as the dominant imperial power within Southeast Asia and the Indian Ocean. Within the next 2 decades, China will likely replace the United States as the Asia-Pacific regional hegemonic power, if not replace us as the global superpower.1 Although China presents its rise as peaceful and non-hegemonic, its construction of naval bases in neighboring countries and military expansion in the region contradict that argument.

With a credible threat to its leading position in a unipolar global order, the United States should adopt a grand strategy of “investment,” building legitimacy and capacity in the very institutions that will protect our interests in a liberal global construct of the future when we are no longer the dominant imperial power. Similar to the Clinton era's grand strategy of “enlargement,”2 investment supports a world order predicated upon a system of basic rules and principles, however, it differs in that the United States should concentrate on the institutions (i.e., United Nations, World Trade Organization, ASEAN, alliances, etc.) that support a world order, as opposed to expanding democracy as a system of governance for other sovereign nations.

Despite its claims of a benevolent expansion, China is already executing a strategy of expansion similar to that of Imperial Japan's Manchukuo policy during the 1930s.3 This three-part strategy involves: “(i) (providing) significant investments in economic infrastructure for extracting natural resources; (ii) (conducting) military interventions (to) protect economic interests; and, (iii) . . . (annexing) via installation of puppet governments.”4 China has already solidified its control over neighboring North Korea and Burma, and has similarly begun more ambitious engagements in Africa and Central Asia where it seeks to expand its frontier.5

Noted political scientist Samuel P. Huntington provides further analysis of the motives behind China's imperial aspirations. He contends that “China (has) historically conceived itself as encompassing a “‘Sinic Zone'. . . (with) two goals: to become the champion of Chinese culture . . . and to resume its historical position, which it lost in the nineteenth century, as the hegemonic power in East Asia.”6 Furthermore, China holds one quarter of the world's population, and rapid economic growth will increase its demand for natural resources from outside its borders as its people seek a standard of living comparable to that of Western civilization.

The rise of peer competitors has historically resulted in regional instability and one should compare “the emergence of China to the rise of. . . Germany as the dominant power in Europe in the late nineteenth century.”7 Furthermore, the rise of another peer competitor on the level of the Soviet Union of the Cold War ultimately threatens U.S. global influence, challenging its concepts of human rights, liberalism, and democracy; as well as its ability to co-opt other nations to accept them.8 This decline in influence, while initially limited to the Asia-Pacific region, threatens to result in significant conflict if it ultimately leads to a paradigm shift in the ideas and principles that govern the existing world order.

A grand strategy of investment to address the threat of China requires investing in institutions, addressing ungoverned states, and building legitimacy through multilateralism. The United States must build capacity in the existing institutions and alliances accepted globally as legitimate representative bodies of the world's governments. For true legitimacy, the United States must support these institutions, not only when convenient, in order to avoid the appearance of unilateralism, which would ultimately undermine the very organizations upon whom it will rely when it is no longer the global hegemon.

The United States must also address ungoverned states, not only as breeding grounds for terrorism, but as conflicts that threaten to spread into regional instability, thereby drawing in superpowers with competing interests. Huntington proposes that the greatest source of conflict will come from what he defines as one “core” nation's involvement in a conflict between another core nation and a minor state within its immediate sphere of influence.9 For example, regional instability in South Asia10 threatens to involve combatants from the United States, India, China, and the surrounding nations. Appropriately, the United States, as a global power, must apply all elements of its national power now to address the problem of weak and failing states, which threaten to serve as the principal catalysts of future global conflicts.11

Admittedly, the application of American power in the internal affairs of a sovereign nation raises issues. Experts have posed the question of whether the United States should act as the world's enforcer of stability, imposing its concepts of human rights on other states. In response to this concern, The International Commission on Intervention and State Sovereignty authored a study titled, The Responsibility to Protect,12 calling for revisions to the understanding of sovereignty within the United Nations (UN) charter. This commission places the responsibility to protect peoples of sovereign nations on both the state itself and, more importantly, on the international community.13 If approved, this revision will establish a precedent whereby the United States has not only the authority and responsibility to act within the internal affairs of a repressive government, but does so with global legitimacy if done under the auspices of a UN mandate.

Any effort to legitimize and support a liberal world construct requires the United States to adopt a multilateral doctrine which avoids the precepts of the previous administration: “preemptive war, democratization, and U.S. primacy of unilateralism,”14 which have resulted in the alienation of former allies worldwide. Predominantly Muslim nations, whose citizens had previously looked to the United States as an example of representative governance, viewed the Iraq invasion as the seminal dividing action between the Western and the Islamic world. Appropriately, any future American interventions into the internal affairs of another sovereign nation must first seek to establish consensus by gaining the approval of a body representing global opinion, and must reject military unilateralism as a threat to that governing body's legitimacy.

Despite the long-standing U.S. tradition of a liberal foreign policy since the start of the Cold War, the famous liberal leviathan, John Ikenberry, argues that “the post-9/11 doctrine of national security strategy . . . has been based on . . . American global dominance, the preventative use of force, coalitions of the willing, and the struggle between liberty and evil.”15 American foreign policy has misguidedly focused on spreading democracy, as opposed to building a liberal international order based on universally accepted principles that actually set the conditions for individual nation states to select their own system of governance. Anne-Marie Slaughter, the former Dean of the Woodrow Wilson School of Public and International Affairs, argues that true Wilsonian idealists “support liberal democracy, but reject the possibility of democratizing peoples . . .”16 and reject military primacy in favor of supporting a rules-based system of order.

Investment in a liberal world order would also set the conditions for the United States to garner support from noncommitted regional powers (i.e., Russia, India, Japan, etc.), or “swing civilizations,” in countering China's increasing hegemonic influence.17 These states reside within close proximity to the Indian Ocean, which will likely emerge as the geopolitical focus of the American foreign policy during the 21st century, and appropriately have the ability to offset China's imperial dominance in the region.18

Critics of a liberal world construct argue that idealism is not necessary, based on the assumption that nations that trade together will not go to war with each other.19 In response, foreign affairs columnist Thomas L. Friedman rebukes their arguments, acknowledging the predicate of commercial interdependence as a factor only in the decision to go to war, and argues that while globalization is creating a new international order, differences between civilizations still create friction that may overcome all other factors and lead to conflict.20

Detractors also warn that as China grows in power, it will no longer observe “the basic rules and principles of a liberal international order,” which largely result from Western concepts of foreign relations. Ikenberry addresses this risk, citing that China's leaders already recognize that they will gain more authority within the existing liberal order, as opposed to contesting it. China's leaders “want the protection and rights that come from the international order's . . . defense of sovereignty,”21 from which they have benefitted during their recent history of economic growth and international expansion.

Even if China executes a peaceful rise and the United States overestimates a Sinic threat to its national security interest, the emergence of a new imperial power will challenge American leadership in the Indian Ocean and Asia-Pacific region. That being said, it is more likely that China, as evidenced by its military and economic expansion, will displace the United States as the regional hegemonic power. Recognizing this threat now, the United States must prepare for the eventual transition and immediately begin building the legitimacy and support of a system of rules that will protect its interests later when we are no longer the world's only superpower.

### AT: Retrenchment Causes War---1NC

#### Retrenchment doesn’t cause war---all studies go neg

Paul K. MacDonald 11, Assistant Professor of Political Science at Williams College, and Joseph M. Parent, Assistant Professor of Political Science at the University of Miami, Spring 2011, “Graceful Decline?: The Surprising Success of Great Power Retrenchment,” International Security, Vol. 35, No. 4, p. 7-44

How do great powers respond to acute decline? The erosion of the relative power of the United States has scholars and policymakers reexamining this question. The central issue is whether prompt retrenchment is desirable or probable. Some pessimists counsel that retrenchment is a dangerous policy, because it shows weakness and invites attack. Robert Kagan, for example, warns, "A reduction in defense spending . . . would unnerve American allies and undercut efforts to gain greater cooperation. There is already a sense around the world, fed by irresponsible pundits here at home, that the United States is in terminal decline. Many fear that the economic crisis will cause the United States to pull back from overseas commitments. The announcement of a defense cutback would be taken by the world as evidence that the American retreat has begun."1 Robert Kaplan likewise argues, "Husbanding our power in an effort to slow America's decline in a post-Iraq and post-Afghanistan world would mean avoiding debilitating land entanglements and focusing instead on being more of an offshore balancer. . . . While this may be in America's interest, the very signaling of such an aloof intention may encourage regional bullies. . . . [L]essening our engagement with the world would have devastating consequences for humanity. The disruptions we witness today are but a taste of what is to come should our country flinch from its international responsibilities."2 The consequences of these views are clear: retrenchment should be avoided and forward defenses maintained into the indefinite future.3¶ Other observers advocate retrenchment policies, but they are pessimistic [End Page 7] about their prospects.4 Christopher Layne, for instance, predicts, "Even as the globe is being turned upside down by material factors, the foreign policies of individual states are shaped by the ideas leaders hold about their own nations' identity and place in world politics. More than most, America's foreign policy is the product of such ideas, and U.S. foreign-policy elites have constructed their own myths of empire to justify the United States' hegemonic role."5 Stephen Walt likewise advocates greater restraint in U.S. grand strategy, but cautions, "The United States . . . remains a remarkably immature great power, one whose rhetoric is frequently at odds with its conduct and one that tends to treat the management of foreign affairs largely as an adjunct to domestic politics. . . . [S]eemingly secure behind its nuclear deterrent and oceanic moats, and possessing unmatched economic and military power, the United States allowed its foreign policy to be distorted by partisan sniping, hijacked by foreign lobbyists and narrow domestic special interests, blinded by lofty but unrealistic rhetoric, and held hostage by irresponsible and xenophobic members of Congress."6 Although retrenchment is a preferable policy, these arguments suggest that great powers often cling to unprofitable foreign commitments for parochial reasons of national culture or domestic politics.7¶ These arguments have grim implications for contemporary international politics. With the rise of new powers, such as China, the international pecking order will be in increasing flux in the coming decades.8 Yet, if the pessimists are correct, politicians and interests groups in the United States will be unwilling or unable to realign resources with overseas commitments. Perceptions of weakness and declining U.S. credibility will encourage policymakers to hold on to burdensome overseas commitments, despite their high costs in blood and treasure.9 Policymakers in Washington will struggle to retire from profitless military engagements and restrain ballooning current accounts and budget deficits.10 For some observers, the wars in Iraq and Afghanistan represent the ill-advised last gasps of a declining hegemon seeking to bolster its plummeting position.11¶ In this article, we question the logic and evidence of the retrenchment pessimists. To date there has been neither a comprehensive study of great power retrenchment nor a study that lays out the case for retrenchment as a practical or probable policy. This article fills these gaps by systematically examining the relationship between acute relative decline and the responses of great powers. We examine eighteen cases of acute relative decline since 1870 and advance three main arguments.¶ First, we challenge the retrenchment pessimists' claim that domestic or international constraints inhibit the ability of declining great powers to retrench. In fact, when states fall in the hierarchy of great powers, peaceful retrenchment is the most common response, even over short time spans. Based on the empirical record, we find that great powers retrenched in no less than eleven and no more than fifteen of the eighteen cases, a range of 61-83 percent. When international conditions demand it, states renounce risky ties, increase reliance on allies or adversaries, draw down their military obligations, and impose adjustments on domestic populations.¶ Second, we find that the magnitude of relative decline helps explain the extent of great power retrenchment. Following the dictates of neorealist theory, great powers retrench for the same reason they expand: the rigors of great power politics compel them to do so.12 Retrenchment is by no means easy, but [End Page 9] necessity is the mother of invention, and declining great powers face powerful incentives to contract their interests in a prompt and proportionate manner. Knowing only a state's rate of relative economic decline explains its corresponding degree of retrenchment in as much as 61 percent of the cases we examined.¶ Third, we argue that the rate of decline helps explain what forms great power retrenchment will take. How fast great powers fall contributes to whether these retrenching states will internally reform, seek new allies or rely more heavily on old ones, and make diplomatic overtures to enemies. Further, our analysis suggests that great powers facing acute decline are less likely to initiate or escalate militarized interstate disputes. Faced with diminishing resources, great powers moderate their foreign policy ambitions and offer concessions in areas of lesser strategic value. Contrary to the pessimistic conclusions of critics, retrenchment neither requires aggression nor invites predation. Great powers are able to rebalance their commitments through compromise, rather than conflict. In these ways, states respond to penury the same way they do to plenty: they seek to adopt policies that maximize security given available means. Far from being a hazardous policy, retrenchment can be successful. States that retrench often regain their position in the hierarchy of great powers. Of the fifteen great powers that adopted retrenchment in response to acute relative decline, 40 percent managed to recover their ordinal rank. In contrast, none of the declining powers that failed to retrench recovered their relative position.

## Warming Advantage

### Warming DA---1NC

#### The global nuclear renaissance will spread enrichment capabilities worldwide---but developing and exporting SMRs prevents states from acquiring the full fuel cycle

Anatoly S. Diyakov 10, Professor of Physics and Director of the Center for Arms Control Energy and Environmental Studies at the Moscow Institute of Physics, Winter 2010, “The nuclear “renaissance” & preventing the spread of enrichment & reprocessing technologies: a Russian view”, Dædalus, Vol. 139, No. 1

The anticipated growth of nuclear power around the world may lead to the spread of nuclear fuel cycle technologies as well. The expectations associated with a renewed interest in nuclear power and the rate of nuclear power growth in the world may be exaggerated; at the very least we can expect that the growth would occur not immediately, but over a long period. Nevertheless, there are definite concerns about the implications of nuclear power expansion for the nuclear nonproliferation regime. Driving these concerns is a sense that, beyond interest in nuclear power, developing countries also have an interest in retaining their right under the Nuclear Non-Proliferation Treaty (npt) to possess nuclear fuel cycle technologies. A potential spread of nuclear fuel cycle technologies, especially technologies for uranium enrichment and for reprocessing spent fuel to separate plutonium, poses a serious concern to the nuclear nonproliferation regime because enrichment and reprocessing capabilities give states the capability to produce fissile materials for weapons.

This is not a new problem. Indeed, as early as 1946, the Acheson-Lillenthal report declared that proliferation risks are inherent to the nuclear fuel cycle. If nations engage in fuel cycle activities it increases the risk of:

• Spread of sensitive technologies from declared facilities, resulting in their illegal transfer to other entities;

• Diversion of nuclear materials from declared fuel cycle facilities;

• Running a military program at undeclared fuel cycle facilities; and

• Breakout–that is, withdrawal from the npt and the subsequent use of safeguarded nuclear facilities for military purposes.

The reality of these dangers was recently demonstrated by North Korea and the A.Q. Khan network. International Atomic Energy Agency (iaea) Director General Mohamed ElBaradei has said that the fuel cycle is the “Achilles heel” of the nonproliferation system.8

Some countries have already declared their right to acquire enrichment and reprocessing technologies. This right is in fact secured for countries party to the npt. The npt does not restrict peaceful development and use of nuclear power; Article IV of the Treaty asserts, “Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes.”

However, in ensuring the right to peaceful use of nuclear energy, the npt also imposes specific obligations upon its member states. In accordance with Article II of the npt, “Each non-nuclearweapon State Party to the Treaty undertakes not to receive the transfer from any transferor whatsoever of nuclear weapons or other nuclear explosive devices or of control over such weapons or explosive devices directly, or indirectly. ” Article III requires that each Treaty participant state “undertakes to accept safeguards . . . for the exclusive purpose of verification of the fulfillment of its obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons.”

The right to develop the nuclear fuel cycle, afforded by the npt, is considered by some to be a loophole in the nonproliferation regime. This loophole, and recent violations of commonly accepted obligations by certain countries, raises questions about the npt’s capacity to protect international security adequately from threats that may occur.

It would be wrong to blame the authors of the npt for this loophole. Over the four decades that have passed since the npt first came into effect, the world has changed dramatically. The npt to a large extent was initially intended to prevent creation of nuclear weapons by industrially advanced countries such as West Germany, Italy, Sweden, Switzerland, South Korea, Taiwan, and others, while simultaneously providing them the bene½t of peaceful nuclear use and security guarantees. When the npt was being negotiated in the 1960s, hardly anyone could have imagined that, with time, the main actors in proliferation and the dangers arising from it would come to be those countries that had recently become liberated from Europe’s colonial dominion (at the time called “developing” or “third-world” countries) and also non-state entities– namely, terrorist organizations.

Considering that objective forces are compelling more and more countries to turn to nuclear energy to satisfy their energy needs, and that they have the right to develop the nuclear fuel cycle, it is necessary to search for solutions that, on the one hand, would prevent proliferation of sensitive nuclear technologies and, on the other hand, would ensure interested countries guaranteed access to external sources of nuclear fuel cycle services and products.

In light of the expected broad utilization of nuclear power, the strengthening of the nonproliferation regime should be sought in two ways. One way presupposes that states abandon plans to acquire uranium enrichment and spent nuclear fuel reprocessing technologies if they do not possess them already. However, this proposal has practically no chance to be realized, at least not in the near future. Furthermore, attempts to implement it at present would be counterproductive to strengthening the nonproliferation regime, since it would require amending the npt. In other words, the npt would have to be “reopened,” and another discriminatory division among npt member states–countries permitted to have the nuclear fuel cycle and those not– would have to be created in addition to the nuclear- and non-nuclear-weapons countries division that already exists. Considering the unwillingness on the part of most non-nuclear states to undertake additional restrictions, it is dif½- cult to expect that the negotiations process, involving participation from all 140 npt member states, would be successful. Many countries believe that restrictions on development of technologies should be universal for all npt participant states, and should not permit some to develop technologies while prohibiting others. For example, Canada has no enrichment plants at present, although it is considering the possibility of creating an enrichment facility for production of low-enriched uranium for its candu reactors. Brazil, which does have an active enrichment program, would be permitted to have it. Efforts to create and enforce this further division would do more to weaken the npt than it would to strengthen it. As the example of Iran shows, additional division of states into those permitted to have enrichment and reprocessing and those forbidden not only undermines the unity of npt member countries, but also facilitates development of a black market for nuclear technologies.

The second way to strengthen the regime entails switching to innovative nuclear power technologies that could sustain the nonproliferation regime by means of inherent physical and technological properties. This would require development of new types of power reactors and the fuel cycles for them. To this end, work is presently being conducted through a number of international programs, including the International Project on Innovative Nuclear Reactors and Fuel Cycles (inpro), Generation IV, and gnep+anfc. However, progress has been slow in these programs, and the possibilities for the creation and use of such innovative nuclear technologies lie in the distant future. Therefore, the expansion of nuclear power in the world, even if started by 2020 to 2025, will be based on the use of light water reactors and existing fuel cycle technologies. Taking into account the current trend toward increasing the operational lifetime of nuclear power reactors up to 60 or 70 years, it becomes obvious that there is a need to ½nd such solutions that could work during a period of at least a century.

#### U.S.-exported SMRs replace indigenous enrichment capability---they’re black-boxed

ITA 11 – International Trade Administration, U.S. Department of Commerce, February 2011, “The Commercial Outlook for U.S. Small Modular Nuclear Reactors,” http://trade.gov/mas/ian/build/groups/public/@tg\_ian/@nuclear/documents/webcontent/tg\_ian\_003185.pdf

Another potential long-term strength of SMRs is that some designs could also support nuclear non-proliferation objectives. All U.S. SMRs are designed to be deployed in an underground configuration. Industry observers contend that this would limit the risk for aboveground sabotage (which is a serious consideration for traditional nuclear power plants) or for radioactive release. The fuel cycle (particularly uranium enrichment and reprocessing) is where most non-proliferation concerns lie. The U.S. SMRs likely to be deployed in the near term are similarly fueled as the existing LWRs, but some U.S. vendors argue that the United States could exercise greater influence in the global nuclear fuel trade if U.S. SMR technology were widely deployed.

Some U.S. SMR vendors claim that their designs could be “black boxed” (that is, they could be deployed already fueled), and once the fuel is spent, the entire unit could be shipped back to the factory for waste handling and reprocessing. If the responsibility for the fuel cycle is taken out of the hands of the reactor operator, then risks of proliferation could potentially be reduced. Significant technical issues, however, remain unsolved for this concept, and there are serious outstanding questions involving transportation, waste handling, safety, and security. Although an attractive idea, such designs are unlikely to be deployed in the near or mid term.

#### Global expansion of enrichment capability is the only way nuclear power can offset enough carbon emissions to solve climate change

Sharon Squassoni 9, Director and Senior Fellow of the Proliferation Prevention Program at CSIS, 3/25/9, “Nuclear Power: How Much More?,” http://www.npolicy.org/article.php?aid=176&rid=2

The amount of nuclear capacity required to make a signification contribution to global climate change mitigation is so large that it would inevitably be widely distributed across the globe. Such a distribution would have particular implications for nuclear proliferation. However, projected distributions of nuclear energy out to 2050 are extremely speculative. The industry itself does not engage in such projections, and countries that set nuclear energy production goals have a history of widely missing long-range targets, such as China and India. The discussion below considers a hypothetical distribution of nuclear energy for 2050, based on the 2003 MIT Study. [12]

Scenario III, shown in Figure 7, uses the “High 2050” scenario in Appendix 2 (“Global Electricity Demand and the Nuclear Power Growth Scenario”) of the 2003 MIT study, The Future of Nuclear Power. Although this is not a distribution designed to achieve optimal CO2 reductions, it is expansion at a level significant enough (1500 GWe) to have an effect on CO2 emissions. This would mean a fourfold increase from current reactor capacity.

The MIT study used an underlying assumption that the developed countries would continue with a modest annual increase in per capita electricity use and the developing countries would move to the 4000 kWh per person per year benchmark if at all feasible (the 4000 kWh benchmark being the dividing line between developed and advanced countries). Electricity demand was then pegged to estimated population growth. Finally, it was assumed that nuclear energy would retain or increase its current share of electricity generation. The least-off developing countries were assumed in the MIT study not to have the wherewithal for nuclear energy. It should be noted that MIT’s 2050 projection was “an attempt to understand what the distribution of nuclear power deployment would be if robust growth were realized, perhaps driven by a broad commitment to reducing greenhouse gas emissions and a concurrent resolution of the various challenges confronting nuclear power’s acceptance in various countries.” A few countries that the MIT High 2050 case included but are not included here are countries that currently have laws restricting nuclear energy, such as Austria.

Implications for Uranium Enrichment

A fourfold expansion of nuclear energy would entail significant new production requirements for uranium enrichment as shown in Figure 8 and possibly, reprocessing. The MIT study anticipated that 54 states would have reactor capacities that could possibly justify indigenous uranium enrichment. If a capability of 10 GWe is considered the threshold at which indigenous enrichment becomes cost-effective, more than 15 additional states could find it advantageous to engage in uranium enrichment.

Figure 9 depicts what the geographic distribution of enrichment capacity might look like, based on the development of 10 GWe or more of reactor capacity. Of course, some states – such as Australia or Kazakhstan – might opt to enrich uranium regardless of domestic nuclear energy capacity, choosing to add value to their own uranium exports. In addition, states may choose to take the path of the UAE, which has formally renounced domestic enrichment and reprocessing in its domestic law, despite aspiring to reach 10 GWe of capacity. Ultimately, these decisions lie very much in the political realm, and can be reversed.

### No Solve

#### SMRs don’t solve warming---they take too long and trade off with renewable tech that’s closer to viability

Arjun Makhijani 10, President of the Institute for Energy & Environmental Research, Ph.D. in engineering (specialization: nuclear fusion) from the University of California at Berkeley; and Michele Boyd, former director of the Safe Energy Program at Physicians for Social Responsibility, September 2010, “Small Modular Reactors,” http://www.psr.org/nuclear-bailout/resources/small-modular-reactors-no.pdf

Efficiency and most renewable technologies are already cheaper than new large reactors. The long time—a decade or more—that it will take to certify SMRs will do little or nothing to help with the global warming problem and will actually complicate current efforts underway. For example, the current schedule for commercializing the above-ground sodium cooled reactor in Japan extends to 2050, making it irrelevant to addressing the climate problem. Relying on assurances that SMRs will be cheap is contrary to the experience about economies of scale and is likely to waste time and money, while creating new safety and proliferation risks, as well as new waste disposal problems.

### No SMR Exports

#### No SMR exports:

#### They’ll only be cost-competitive for international export if the U.S. imposes a carbon tax---obviously zero chance of that

David Solan et al 10, Assistant Professor of Public Policy & Administration and Director of the Energy Policy Institute at Boise State University, et al., June 2010, “Economic and Employment Impacts of Small Modular Nuclear Reactors,” http://epi.boisestate.edu/media/3494/economic%20and%20employment%20impacts%20of%20smrs.pdf

The development of a robust domestic SMR industry will result in significant economic benefits. Given the assumptions regarding the deployment of SMRs as outlined in the Moderate and High Nuclear Adoption cases, the manufacture and construction of SMRs in 2030 will be responsible for an estimated range of: 215,000 - 255,000 jobs,; $40 - $48 billion in sales; $19 - $23 billion in value-added; $12 - $15 billion in annual earnings; and $1.1 - $1.3 billion in indirect business taxes. From cumulative operations through 2030, SMRs will be responsible for: 52,000 - 80,000 jobs; $15 - $23 billion in sales; $10 - $15 billion in value-added; $4 - $6 billion in annual earnings; and $1.3 - $2 billion in indirect business taxes. Aggressive development of a domestic SMR industry, as outlined in the Disruptive Nuclear Adoption Case, roughly triples these estimated impacts and generates very significant economic benefits.

In stark contrast, the conditions assumed in the Low Nuclear Adoption (also called the No Greenhouse Gas Legislation) case, result in approximately l/10th of the economic benefits of the High and Moderate cases, with just a few SMRs manufactured domestically on an annual basis by 2030. The results of the Low Nuclear Adoption Case indicate a likely low probability for achieving a globally competitive and stable SMR manufacturing industry in the U.S.

First, crucial to the success of the SMR manufacturing industry is successfully navigating the NRC licensing process in a satisfactory timeframe. Because the SMR design and manufacturing industry is globally competitive and SMRs will compete with other options for U.S. electricity generation, significant delays or failure of specific designs in NRC licensing could result in a domestic industry that does not realize its potential. Second, the economic impacts and market penetration of SMRs corresponds to the degree of anticipated carbon regulation—the tighter the regulation and the higher the price on carbon, the greater the degree of SMR (and nuclear) success. Third, the issue of siting has not yet been addressed. Nuclear energy may be at its highest public approval rating in more than a generation (Jones, 2010), but it is still an assumption the American public is readily willing to site many new nuclear reactors. In addition, it is assumed that SMRs will be easier to site than traditional nuclear power generation facilities although this notion has not yet been tested. Likewise, competitors to nuclear power, in particular coal plants, have experienced sustained public opposition of late. The degree of public acceptance (or rejection) of nuclear power in relation to its competitors will be important to market penetration in the future.

#### No global liability regime exists---that’s an absolute prerequisite to international exports

ITA 11 – International Trade Administration, U.S. Department of Commerce, February 2011, “The Commercial Outlook for U.S. Small Modular Nuclear Reactors,” http://trade.gov/mas/ian/build/groups/public/@tg\_ian/@nuclear/documents/webcontent/tg\_ian\_003185.pdf

Nuclear liability is a significant concern for SMR and large reactor designers. Currently, no global nuclear liability regime exists. This situation not only complicates commercial arrangements, but also means that, in the unlikely event of a nuclear incident, claims for damages would be the subject of protracted and complicated litigation in the courts of many countries against multiple potential defendants with no guarantee of recovery. The IAEA-sponsored Convention on Supplementary Compensation for Nuclear Damage (CSC) is the only international instrument that provides the basis for establishing a global regime, including countries with and without nuclear power facilities. U.S. nuclear suppliers have stated that the implementation of CSC is a necessity for pursuing a major nuclear export program.

### No Positive Feedbacks---General---1NC

#### No positive feedbacks---this takes out 100% of the impact to warming

Fritz Vahrenholt 12, Honorary Professor of chemistry at the University of Hamburg, former Umweltsenator in the German Ministry for Environment, Scientific Reviewer for the 2010 IPCC, June 18, 2012, “Global warming: second thoughts of an environmentalist,” The Telegraph, online: http://www.telegraph.co.uk/comment/9338939/Global-warming-second-thoughts-of-an-environmentalist.html

Furthermore, what is little known is that CO2 also requires a strong amplifier if it were to aggressively shape future climate as envisaged by the IPCC. CO2 alone, without so-called feedbacks, would only generate a moderate warming of 1.1°C per CO2 doubling. The IPCC assume in their models that there are strong amplification processes, including water vapour and cloud effects which, however, are also still poorly understood, like solar amplification. These are the shaky foundations for the IPCC's alarming prognoses of a temperature rise of up to 4.5°C for a doubling of CO2.

In the last 10 years the solar magnetic field dropped to one of its lowest levels in the last 150 years, indicating lower intensity in the decades ahead. This may have contributed to the halt in global warming and is likely to continue for a while, until it may resume gradually around 2030/2040. Based on the past natural climate pattern, we should expect that by 2100 temperatures will not have risen more than 1°C, significantly less than proposed by the IPCC.

Climate catastrophe would have been called off and the fear of a dangerously overheated planet would go down in history as a classic science error. Rather than being largely settled, there are more and more open climate questions which need to be addressed in an impartial and open-minded way.

### Impact Defense---General---1NC

#### No impact---mitigation and adaptation will solve---no tipping point or “1% risk” args

Robert O. Mendelsohn 9, the Edwin Weyerhaeuser Davis Professor, Yale School of Forestry and Environmental Studies, Yale University, June 2009, “Climate Change and Economic Growth,” online: http://www.growthcommission.org/storage/cgdev/documents/gcwp060web.pdf

The heart of the debate about climate change comes from a number of warnings from scientists and others that give the impression that human-induced climate change is an immediate threat to society (IPCC 2007a,b; Stern 2006). Millions of people might be vulnerable to health effects (IPCC 2007b), crop production might fall in the low latitudes (IPCC 2007b), water supplies might dwindle (IPCC 2007b), precipitation might fall in arid regions (IPCC 2007b), extreme events will grow exponentially (Stern 2006), and between 20–30 percent of species will risk extinction (IPCC 2007b). Even worse, there may be catastrophic events such as the melting of Greenland or Antarctic ice sheets causing severe sea level rise, which would inundate hundreds of millions of people (Dasgupta et al. 2009). Proponents argue there is no time to waste. Unless greenhouse gases are cut dramatically today, economic growth and well‐being may be at risk (Stern 2006).

These statements are largely alarmist and misleading. Although climate change is a serious problem that deserves attention, society’s immediate behavior has an extremely low probability of leading to catastrophic consequences. The science and economics of climate change is quite clear that emissions over the next few decades will lead to only mild consequences. The severe impacts predicted by alarmists require a century (or two in the case of Stern 2006) of no mitigation. Many of the predicted impacts assume there will be no or little adaptation. The net economic impacts from climate change over the next 50 years will be small regardless. Most of the more severe impacts will take more than a century or even a millennium to unfold and many of these “potential” impacts will never occur because people will adapt. It is not at all apparent that immediate and dramatic policies need to be developed to thwart long‐range climate risks. What is needed are long‐run balanced responses.

### Impact Defense---Ocean Acidification

#### No ocean acidification impact---CO2’s impact is positive on most marine life

Craig Idso et al 12, founder and chairman of the board of the Center for the Study of Carbon Dioxide and Global Change, member of the American Association for the Advancement of Science, American Geophysical Union, American Meteorological Society, Arizona-Nevada Academy of Sciences, and Association of American Geographers; Sherwood Idso, research physicist with the USDA's Agricultural Research Service at the US Water Conservation Laboratory and adjunct professor at the ASU Office of Climatology; and Keith Idso, Vice President of the Center for the Study of Carbon Dioxide and Global Change, July 11, 2012, “The Potential for Adaptive Evolution to Enable the World's Most Important Calcifying Organism to Cope with Ocean Acidification,” CO2 Science, Vol. 15, No. 28

In an important paper published in the May 2012 issue of Nature Geoscience, Lohbeck et al. write that "our present understanding of the sensitivity of marine life to ocean acidification is based primarily on **short-term experiments**," which often depict negative effects. However, they go on to say that phytoplanktonic species with short generation times "may be able to respond to environmental alterations through adaptive evolution." And with this tantalizing possibility in mind, they studied, as they describe it, "the ability of the world's single most important calcifying organism, the coccolithophore Emiliania huxleyi, to evolve in response to ocean acidification in two 500-generation selection experiments."

Working with freshly isolated genotypes from Bergen, Norway, the three German researchers grew them in batch cultures over some 500 asexual generations at three different atmospheric CO2 concentrations - ambient (400 ppm), medium (1100 ppm) and high (2200 ppm) - where the medium CO2 treatment was chosen to represent the atmospheric CO2 level projected for the beginning of the next century. This they did in a multi-clone experiment designed to provide existing genetic variation that they said "would be readily available to genotypic selection," as well as in a single-clone experiment that was initiated with one "haphazardly chosen genotype," where evolutionary adaptation would obviously require new mutations. So what did they learn?

Compared with populations kept at ambient CO2 partial pressure, Lohbeck et al. found that those selected at increased CO2 levels "exhibited higher growth rates, in both the single- and multi-clone experiment, when tested under ocean acidification conditions." Calcification rates, on the other hand, were somewhat lower under CO2-enriched conditions in all cultures; but the research team reports that they were "up to 50% higher in adapted [medium and high CO2] compared with non-adapted cultures." And when all was said and done, they concluded that "contemporary evolution could help to maintain the functionality of microbial processes at the base of marine food webs in the face of global change [our italics]."

In other ruminations on their findings, the marine biologists indicate that what they call the swift adaptation processes they observed may "have the potential to affect food-web dynamics and biogeochemical cycles on timescales of a few years, thus surpassing predicted rates of ongoing global change including ocean acidification." And they also note, in this regard, that "a recent study reports surprisingly high coccolith mass in an E. huxleyi population off Chile in high-CO2 waters (Beaufort et al., 2011)," which observation is said by them to be indicative of "across-population variation in calcification, in line with findings of rapid microevolution identified here."

## 2NC

## CP

### Solvency---Grid---2NC

#### None of their answers presume the combination of mechanisms---the full CP altogether resolves deficiencies of any single plank---that solves islanding, and DOD will remedy any failures in the system

Dr. Dorothy Robyn 12, Deputy Under Secretary of Defense for Installations and Environment, 3/27/12, Testimony before the Senate Appropriations Subcommittee on Military Construction, Veterans Affairs, and Related Agencies, Congressional Documents & Publications, lexis

The first two elements of our facility energy strategy contribute indirectly to installation energy security; in addition, we are addressing the problem directly. A major focus of my office is smart microgrid technology. Smart microgrids and energy storage offer a more robust and cost effective approach to ensuring installation energy security than the current one--namely, back-up generators and (limited) supplies of on-site fuel. Although microgrid systems are in use today, they are relatively unsophisticated, with limited ability to integrate renewable and other distributed energy sources, little or no energy storage capability, uncontrolled load demands and "dumb" distribution that is subject to excessive losses. By contrast, we envision microgrids as local power networks that can utilize distributed energy, manage local energy supply and demand, and operate seamlessly both in parallel to the grid and in "island" mode.

Advanced microgrids are a "triple play" for DoD's installations. Such systems will reduce installation energy costs on a day-to-day basis by allowing for load balancing and demand response. They will also facilitate the incorporation of renewable and other on-site energy generation. Most important, the combination of on-site energy and storage, together with the microgrid's ability to manage local energy supply and demand, will allow an installation to shed non-essential loads and maintain mission-critical loads if the grid goes down.

The Installation Energy Test Bed, discussed below, has funded ten demonstrations of microgrid and storage technologies to evaluate the benefits and risks of alternative approaches and configurations. Demonstrations are underway at Twentynine Palms, CA; Fort Bliss, TX; Joint Base McGuire-Dix-Lakehurst, NJ; Fort Sill, OK; and several other installations.

Although microgrids will address the grid security problem over time, we are taking steps to address near-term concerns. Together with the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, I co-chair DoD's Electric Grid Security Executive Council (EGSEC), which works to improve the security, adequacy and reliability of electricity supplies and related infrastructure key to the continuity of critical defense missions. In addition to working across DoD, the EGSEC works with the Departments of Energy and Homeland Security. The three agencies recently created an Energy Surety Public Private Partnership (ES3P) to work with the private sector. As an initial focus, the ES3P is collaborating with four utilities in the National Capital Region to improve energy security at mission critical facilities.

#### Microgrids solve the case and avoid all their answers---ensures islanding, effective on forward bases, and DOD leadership improves renewable tech which is already sweet

Amory B. Lovins 10, Chairman/Chief Scientist of the Rocky Mountain Institute, second quarter 2010, “DOD’s Energy Challenge as Strategic Opportunity,” Joint Force Quarterly, http://www.ndu.edu/press/lib/images/jfq-57/lovins.pdf

The U.S. electric grid was named by the National Academy of Engineering as the top engineering achievement of the 20th century. It is very capital-intensive, complex, technologically unforgiving, usually reliable, but inherently brittle. It is responsible for ~98–99 percent of U.S. power failures, and occasionally blacking out large areas within seconds—because the grid requires exact synchrony across subcontinental areas and relies on components taking years to build in just a few factories or one (often abroad), and can be interrupted by a lightning bolt, rifle bullet, malicious computer program, untrimmed branch, or errant squirrel. Grid vulnerabilities are serious, inherent, and not amenable to quick fixes; current Federal investments in the “smart grid” do not even require simple mitigations. Indeed, the policy reflex to add more and bigger power plants and power lines after each regional blackout may make the next blackout more likely and severe, much as suppressing forest fires can accumulate fuel loadings that turn the next unsuppressed fire into an uncontrollable conflagration.

Power-system vulnerabilities are even worse in-theater, where infrastructure and the capacity to repair it are often marginal: “attacks on the grid are one of the most common and effective tactics of insurgents in Iraq, and are increasingly seen in Afghanistan.” 39 Thus electric, not oil, vulnerabilities now hazard national and theater energy security. Simple exploitation of domestic electric vulnerabilities could take down DOD’s basic operating ability and the whole economy, while oil supply is only a gathering storm.

The DSB Task Force took electrical threats so seriously that it advised DOD— following prior but unimplemented DOD policy 40 —to replace grid reliance, for critical missions at U.S. bases, with onsite (preferably renewable) power supplies in netted, islandable 41 microgrids. The Department of Energy’s Pacific Northwest National Laboratory found ~90 percent of those bases could actually meet those critical power needs from onsite or nearby and mainly renewable sources, and often more cheaply. This could achieve zero daily net energy need for facilities, operations, and ground vehicles; full independence in hunker-down mode (no grid); and increased ability to help serve surrounding communities and nucleate blackstart of the failed commercial grid.

Implementing these sensible policies merits high priority: probably only DOD can move as decisively as the threat to national security warrants. And as with the Endurance capability, exploiting Resilience—building on DOD’s position as the world’s leading director-indirect buyer of renewable energy—would provide leadership, market expansion, delivery refinement, and training that would accelerate civilian adoption. Already, the 2008 NDAA requires DOD to establish a goal to make or buy at least 25 percent of its electricity from renewables by 2020, and study solar and windpower feasibility for expeditionary forces. Under 2007 Executive Order 13423’s Government-wide mandate, DOD must also reduce energy intensity by FY15 to 30 percent below FY03. The Resilience capability would focus all these efforts on robust architectures and implementation paths, ensuring that bases’ onsite renewables deliver reliable power to critical loads whether or not the commercial grid is working—a goal not achieved by today’s focus on compliance with renewables quotas.

Resilience is even more vital and valuable abroad, in fixed installations and especially in FOBs (whose expeditionary character emphasizes the Endurance logic of Fully Burdened Cost of Electricity). Foreign grids are often less reliable and secure than U.S. grids; protection and social stability may be worse; logistics are riskier and costlier in more remote and austere sites; and civilian populations may be more helped and influenced. Field commanders strongly correlate reliable electricity supplies with political stability. In Sadr City, Army Reserve Major General Jeffrey Talley’s Task Force Gold proved in 2008–2009 that making electricity reliable, and thus underpinning systematic infrastructure-building, is an effective cornerstone of counterinsurgency.

Reconstruction in Iraq and Afghanistan is starting to define and capture this opportunity to build civic cohesion and dampen insurgency, while reducing attacks’ disruption and attractiveness. A resilient, distributed electrical architecture can bring important economic and social side-benefits, as with Afghan microhydropower programs for rural development. Cuba lately showed, too, that aggressively integrating end-use efficiency with micropower can cut national blackouts—caused by decrepit infrastructure, not attacks—by one to two orders of magnitude in a year.

At home, DOD efficiency and micropower echo new domestic energy policy and startling developments in the marketplace. In 2006, micropower 42 delivered one-sixth of the world’s electricity, one-third of its new electricity, and 16 to 52 percent of all electricity in a dozen industrialized countries (the United States lagged with 7 percent). In 2008, for the first time in about a century, the world invested more in renewable than in fossilfueled power supplies; renewables (excluding big hydroelectric dams) added 40 billion watts of global capacity and got $100 billion of private investment. Their competitive and falling costs, short lead times, and low financial risks attract private capital. Shifting to these more resilient energy solutions goes with the market’s flow.

### DOD Wants---2NC

#### Framing issue---the DOD votes neg---they want renewables because bases are ideally situated to support them

DOD 11 – Department of Defense, 7/11/11, “Department of Defense Strategic Sustainability Performance Plan,” http://www.acq.osd.mil/ie/download/green\_energy/dod\_sustainability/DoD%20SSPP%20Public\_2011.pdf

Relating specifically to the fixed installations under the purview of this Plan, a final challenge is grid vulnerability. DoD’s reliance on the commercial grid to deliver electricity to more than 500 major installations places the continuity of critical missions at risk. In general, installations lack the ability to manage their demand for and supply of electrical power, making them potentially vulnerable to intermittent or prolonged power disruption caused by natural disasters, attacks, or sheer overload of the grid. With the increasing reliance of U.S. combat forces on “reach back” support from installations in the United States, power failures at those installations could adversely affect power projection and homeland defense capability. This means that an energy threat to bases in the United States can be a threat to operations abroad. The Department is committed to renewable energy not only because it is dedicated to showing leadership in sustainability, but because it improves resilience and thus mission readiness. Military installations are generally well situated to support solar, wind, geothermal and other forms of renewable energy, as long as the type of energy facility, its siting, and its physical and operational characteristics are carefully evaluated and mitigated as needed for any mission or readiness impacts.

The Department continues to pursue an investment strategy designed to reduce energy demand in fixed installations, while increasing the supply of renewable energy sources. Efforts to curb demand for energy— through conservation measures and improved energy efficiency—are by far the most cost-effective ways to improve an installation’s energy profile. A large fraction of DoD energy efficiency investments goes to retrofit existing buildings. Typical retrofit projects install high efficiency heating, ventilation and cooling systems, energy management control systems, improved lighting, and “green” roofs.

The Department is taking advantage of the fact that DoD’s fixed installations offer an ideal test bed for next-generation energy technologies developed by industry, the Department of Energy (DOE), and university laboratories, filling the gap between research and broad commercial deployment. Emerging energy technologies hold the promise for dramatic improvements in energy performance but face major impediments to commercialization and deployment. DoD’s built infrastructure and lands encompass a diversity of building types and climates in the United States, affording an exceptional opportunity to assess the technical validity, operating costs, and environmental impact of advanced, pre-commercial technologies. As both a real and a virtual test bed, our facilities can serve as a sophisticated first user, evaluating the technical validity, cost and environmental impact of advanced, pre-commercial technologies. The Department’s energy test bed concept is being applied to improve the energy efficiency of buildings, improve renewable energy technologies on or in proximity to installations, and develop smart microgrids. DoD can help create a market for those technologies that prove effective and reliable by serving as an early adopter, as it did with jet engines, computers and the internet. The test bed approach is key to meeting the Department’s needs, allowing DoD to leverage both cost savings and technology advances from the private sector. In addition, the test bed is an essential element of the national strategy to develop and deploy the next generation of energy technologies needed to support the nation’s infrastructure.

### Alaska---1NC Addition

#### Large-scale renewable energy adoption solves energy security at Alaskan bases---1AC article

WM Warwick 10, Pacific Northwest National Laboratory, September 2010, “Renewable Resource Development on Department of Defense Bases in Alaska: Challenges and Opportunities,” <http://www.pnl.gov/main/publications/external/technical_reports/PNNL-19742.pdf>

The potential to increase utilization of renewable energy sources among military facilities in Alaska through coordinated development and operation of available resources, both renewable and conventional, is the premise of this task. This potential exists because Pacific Northwest National Laboratory (PNNL) previously identified significant wind and other renewable resources at two Army installations, Fort Richardson and Fort Greely that are at opposite ends of the regional transmission system (the Railbelt transmission system). Full exploitation of these resources will require transmission access to wheel power to Department of Defense (DOD) facilities connected to it. The primary focus of the task initially was identification of legal and regulatory barriers that may prohibit realization of this potential, specifically with regard to the legal ability of installations to wheel power among the various locations to optimize the development and use of renewable resources. In addition to the legal hurdles, this potential may not be realized because of limitations that are technical, economic, and mission related.

This task was premised on the understanding that coordinated operation of DOD resources across the Railbelt could only be accomplished through utilization of civilian infrastructure, including utilization of transmission capacity on the Golden Valley Electric Association (GVEA) system at minimum, and access to the bulk of the Railbelt transmission system in the ideal. At the outset of the study, it became clear that the notion of integrated operation of the Railbelt transmission system to optimize resource utilization was of interest to the Army, Air Force, Alaska utilities and state government. And that each was considering plans to pursue their vision somewhat independently. The most fully developed plans available for this study were those of the Army and the state. Fortunately, a contemporaneous study of this issue by the state provided both a parallel framework for this task and critically important data and results that were used in it. At the same time, the recommendations from the state study create new uncertainties, specifically; the interests of the state in integrated Railbelt transmission operations may preempt those of the military. That could present challenges to the notion of a “military grid” operating within the existing civilian infrastructure. By the same token, state action to implement a state-wide grid could facilitate the “military grid” objective by increasing transmission capacity, albeit on a schedule and at a cost that could differ from that of DOD. Further examination of both the state study and the larger energy context in the state revealed other parallel activities that could affect implementation of a military grid. Evaluation of these other efforts, most of which are in their early stages, indicates the military has a number of opportunities to affect the future course of energy infrastructure development in the state in a way that benefits both itself and civilian society. However, doing so will require prompt action to engage in processes over which the military has little control, subjecting its plans and aspirations to unknown schedules and outcomes. Doing nothing with respect to these other plans and proceedings will leave the military at the mercy of those outcomes; outcomes that are likely to be less favorable, especially in terms of long term costs of electricity.

### Alaska---Solves Arctic

#### Renewable development solves the Arctic advantage

Eric Johnson 12, Research Technician at Alaska Center for Energy and Power, et al., June 2012, “Stranded Renewable Energy Resources of Alaska: A Preliminary Overview of Opportunities and Challenges to Development,” <http://www.uaf.edu/files/acep/Standed-Renewables-Report-Final.pdf>

Shipping and the Arctic: Given the current decrease in sea ice in the Arctic, better assessing the foreseen challenges and opportunities associated with accessing and developing Alaska's stranded renewable energy resources should be a priority at both the State and Federal level. Organizations such as the Institute of the North and the Arctic Counsel, and forums such as the Arctic Imperative are important organizations to engage, in coordination with a broader Arctic community.

### AT: Smart Grids Bad---Link Turn

#### Also, this has to hurt---SMRs cause the civilian smart grid but the CP doesn’t because renewables can’t power large population centers---means their offense only links to them

Micah J. Loudermilk 11, Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University, 5/31/11, “Small Nuclear Reactors and US Energy Security: Concepts, Capabilities, and Costs,” 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

Small nuclear reactors, however, like renewable sources, can provide enhanced, distributed, and localized power generation. As the US moves towards embracing smart grid technologies, power production at this level becomes a critical piece of the puzzle. Especially since renewable sources, due to sprawl, are of limited utility near crowded population centers, small reactors may in fact prove instrumental to enabling the smart grid to become a reality.

### Cyber-Security---2NC

#### Key corporations developing microgrids are making them cyber-secure---and the military votes for the CP

Sandra I. Erwin 11, Editor, National Defense Magazine, July 2011, “High-Tech Weapon Makers Set Sights on ‘Smart Microgrid’ Market,” http://www.nationaldefensemagazine.org/archive/2011/July/Pages/High-TechWeaponMakersSetSightson%E2%80%98SmartMicrogrid%E2%80%99Market.aspx

SBI suggests that most of the military microgrid business will come from U.S. military bases that seek reliable and secure energy. “The majority of U.S. military bases are powered by public electrical grids, which in some instances lead to as many as 300 power outages per year,” the study says. “These interruptions weaken military readiness and security. In the face of a terrorist attack or natural disasters, reliance on conventional energy supplies may be inefficient and may even be detrimental to military functions.”

A Pentagon advisory panel, the Defense Science Board, noted in a 2008 study that military bases’ dependence on often unreliable commercial power suppliers makes Defense Department installations vulnerable. Many defense contractors viewed that study as a cue that they needed to get into the energy business.

Lockheed Martin Corp. is one of several top defense industry firms that are jockeying for position in the microgrid market.

The company recently expanded its “microgrid development center” in Dallas to increase its load capacity from 100 kilowatts to 500 kilowatts, and energy storage from 4 kilowatt hours to 20 kilowatt hours.

Lockheed officials not only see an emerging market in constructing microgrids but also in supplying cybersecurity systems to protect them from hackers or computer viruses.

Lockheed Vice President and Chief Technology Officer Ray Johnson says the company has been pursuing new business in the energy sector for about two years. Revenues from defense-related energy programs currently are minimal, but Lockheed officials anticipate greater Pentagon investments in green programs. “DoD has recognized the strategic importance of energy, and it uses 1.5 percent of the nation’s energy,” Johnson says in an interview. “Energy activities are part of each of our four business areas, and [they] are expanding broadly.”

He predicts smart grids increasingly will become an “imperative” for the Defense Department as it searches for ways in which deployed units and military installations can “operate independently when they’re off the [local] grid.” Smart grids also make it easier to bring renewable energy into a larger grid. Under a 2007 law, the Defense Department by 2025 must generate 25 percent of its electricity from renewable sources, such as wind and solar.

Advanced microgrids have been on the military’s wish list for years, and there is now fresh momentum to begin deploying them, says Elizabeth Porter, director of corporate energy initiatives at Lockheed Martin. The military services are beginning to see the data about potential fuel savings and are interested in moving projects forward, she says.

### AT: Col Addon

#### We should focus on short-term impacts before colonization – ignoring Earth makes terrestrial problems worse

**Williams 10** – M.S. in Physics and is a physics faculty member at Santa Rose Junior College (1/1/2010, Lynda, “Irrational Dreams of Space Colonization”, Peace Review: A Journal of Social Justice, 22:4–8, http://www.scientainment.com/lwilliams\_peacereview.pdf)

According to scientific theory, the destruction of Earth is a certainty. About five billion years from now, when our sun exhausts its nuclear fuel, it will expand in size and envelope the inner planets, including Earth, and burn them into oblivion. So yes, we are doomed, but we have five billion years, plus or minus a few hundred million, to plan our extraterrestrial escape. The need to colonize the moon or Mars to guarantee our survival is not pressing. There are also real risks due to collisions with asteroids and comets, although none are of immediate threat and do not necessitate extraterrestrial colonization. There are many Earth-based technological strategies that can be developed in time to mediate such astronomical threats, such as gravitational tugboats that drag the objects out of range. The solar system could also potentially be exposed to galactic sources of highenergy gamma ray bursts that could fry all life on Earth; any moon or Mars base would face a similar fate. Thus, human-based colonies on the moon or Mars would not protect us from any of these astronomical threats in the near future. Life on Earth is more urgently threatened by the destruction of the biosphere and its life-sustaining habitat due to environmental catastrophes such as climate change, ocean acidification, disruption of the food chain, bio-warfare, nuclear war, nuclear winter, and myriads of other manmade doomsday possibilities. If we accept these threats as inevitabilities on par with real astronomical dangers and divert our natural, intellectual, political, and technological resources from solving these problems into escaping them, will we be playing into a self-fulfilling prophesy of our own planetary doom? Seeking spacebased solutions to our earthly problems may actually exacerbate the planetary threats we face. This is the core of the ethical dilemma posed by space colonization: should we put our resources into developing human colonies on other worlds to survive natural and manmade catastrophes, or should we focus all of our energies on solving and mitigating the problems that create these threats on Earth?

### AT: Extinction Inev

**Humanity will survive for between 5,000 and 8 billion years: 95% confidence interval**

Jason G. **Matheny**, **Research Associate at the Future of Human Institute at Oxford University**, **Ph.D. Candidate in Applied Economics** at Johns Hopkins University, holds a Master’s in Public Health from the Bloomberg School of Public Health at Johns Hopkins University and an M.B.A. from the Fuqua School of Business at Duke University, **2007** (“Reducing the Risk of Human Extinction,” *Risk Analysis*, Volume 27, Issue 5, October, Available Online at http://jgmatheny.org/matheny\_extinction\_risk.htm, Accessed 07-04-2011)

We have some influence over how long we can delay human extinction. Cosmology dictates the upper limit but leaves **a large field of play**. At its lower limit, humanity could be extinguished as soon as this century by succumbing to near-term extinction risks: nuclear detonations, asteroid or comet impacts, or volcanic eruptions could generate enough atmospheric debris to terminate food production; a nearby supernova or gamma ray burst could sterilize Earth with deadly radiation; greenhouse gas emissions could trigger a positive feedback loop, causing a radical change in climate; a genetically engineered microbe could be unleashed, causing a global plague; or a high-energy physics experiment could go awry, creating a "true vacuum" or strangelets that destroy the planet (Bostrom, 2002 ; Bostrom & Cirkovic, 2007 ; Leslie, 1996 ; Posner, 2004 ; Rees, 2003 ). Farther out in time are risks from technologies that remain theoretical but might be developed in the next century or centuries. For instance, self-replicating nanotechnologies could destroy the ecosystem; and cognitive enhancements or recursively self-improving computers could exceed normal human ingenuity to create uniquely powerful weapons (Bostrom, 2002 ; Bostrom & Cirkovic, 2007 ; Ikle, 2006 ; Joy, 2000 ; Leslie, 1996 ; Posner, 2004 ; Rees, 2003 ). Farthest out in time are astronomical risks. In one billion years, the sun will begin its red giant stage, increasing terrestrial temperatures above 1,000 degrees, boiling off our atmosphere, and eventually forming a planetary nebula, making Earth inhospitable to life (Sackmann, Boothroyd, & Kraemer, 1993 ; Ward & Brownlee, 2002 ). If we colonize other solar systems, we could survive longer than our sun, perhaps another 100 trillion years, when all stars begin burning out (Adams & Laughlin, 1997 ). We might survive even longer if we exploit nonstellar energy sources. But it is hard to imagine how humanity will survive beyond the decay of nuclear matter expected in 1032 to 1041 years (Adams & Laughlin, 1997 ).3 Physics seems to support Kafka's remark that "[t]here is infinite hope, but not for us." While it may be physically possible for humanity or its descendents to flourish for 1041 years, it seems unlikely that humanity will live so long. Homo sapiens have existed for 200,000 years. Our closest relative, homo erectus, existed for around 1.8 million years (Anton, 2003 ). The median duration of mammalian species is around 2.2 million years (Avise et al., 1998 ). A controversial approach to estimating humanity's life expectancy is to use observation selection theory. The number of homo sapiens who have ever lived is around 100 billion (Haub, 2002 ). Suppose the number of people who have ever or will ever live is 10 trillion. If I think of myself as a random sample drawn from the set of all human beings who have ever or will ever live, then the probability of my being among the first 100 billion of 10 trillion lives is only 1%. It is more probable that I am randomly drawn from a smaller number of lives. For instance, if only 200 billion people have ever or will ever live, the probability of my being among the first 100 billion lives is 50%. The reasoning behind this line of argument is controversial but has survived a number of theoretical challenges (Leslie, 1996 ). Using observation selection theory, Gott (1993) estimated that **humanity would survive an additional 5,000 to 8 million years, with 95% confidence**.

**We can live on earth forever.**

**Leslie 96** (John, is a philosopher who focuses on explaining existence. “T H E E N D O F T H E WORLD” Pg 145)

Ozone layer destruction, greenhouse warming, the pollution crisis, the exhaustion of farmlands and the loss of biodiversity all threaten to cause immense misery. Yet they too might well appear unlikely to wipe out the entire human race, particularly since people could take refuge in artificial biospheres. Now, a few surviving thousands would probably be a sufficient base from which new billions could grow. The same can probably be said of global nuclear warfare. Artificial biospheres could maintain the human race if the remainder of the planetary surface became uninhabitable. Advances in nanotechnology might be very perilous. However, there is every hope that they wouldn’t be made before humans had moved far enough towards a single world government to be able to insist on safeguards. Furthermore, colonization of the entire solar system, and perhaps even of other star systems, would probably be progressing speedily when the nanotechnological revolution arrived—so that, once again, destruction of all humans on Earth wouldn’t mean the end of humans as a species.

## Military Adv

### Grid---Squo Solves---General---1NC

#### Status quo solves grid cyber vulnerability

Paul Clark 12, MA Candidate, Intelligence/Terrorism Studies, American Military University; Senior Analyst, Chenega Federal Systems, 4/28/12, “The Risk of Disruption or Destruction of Critical U.S. Infrastructure by an Offensive Cyber Attack,” http://blog.havagan.com/wp-content/uploads/2012/05/The-Risk-of-Disruption-or-Destruction-of-Critical-U.S.-Infrastructure-by-an-Offensive-Cyber-Attack.pdf

An attack against the electrical grid is a reasonable threat scenario since power systems are "a high priority target for military and insurgents" and there has been a trend towards utilizing commercial software and integrating utilities into the public Internet that has "increased vulnerability across the board" (Lewis 2010). Yet the increased vulnerabilities are mitigated by an increased detection and deterrent capability that has been "honed over many years of practical application" now that power systems are using standard, rather than proprietary and specialized, applications and components (Leita and Dacier 2012). The security of the electrical grid is also enhanced by increased awareness after a smart-grid hacking demonstration in 2009 and the identification of the Stuxnet malware in 2010: as a result the public and private sector are working together in an "unprecedented effort" to establish robust security guidelines and cyber security measures (Gohn and Wheelock 2010).

### Grid---Squo Solves---Islanding---2NC

#### DOD is massively increasing efforts to ensure operational continuity---means zero risk of mission interruption during a significant commercial grid outage

Michael Aimone 9-12, Director, Business Enterprise Integration, Office of the Deputy Under Secretary of Defense (Installations and Environment), 9/12/12, Statement Before the House Committee on Homeland Security, Subcommittee on Cybersecurity, Infrastructure Protection and Security Technologies, http://homeland.house.gov/sites/homeland.house.gov/files/Testimony%20-%20Aimone.pdf

Chairman Lungren and distinguished Members of the Subcommittee. Thank you for the opportunity to testify. I was asked to address the question of how the Department of Defense (DoD) would operate during a significant outage of the commercial electric power grid.

Although today’s hearing is focused on the prospect of an electromagnetic pulse (EMP) event, such an event is only one scenario for a grid outage. DoD is heavily dependent on the commercial electric power grid. The Department has two closely coordinated sets of activities that focus on the need to maintain critical mission activities in the event of a commercial grid outage. One set of activities, led by DoD’s office of homeland defense, is part of the Department’s explicit “mission assurance strategy.” The other set of activities, focused on the Department’s fixed installations and led by its Installations and Environment office, falls under DoD’s “facility energy strategy.”

Mission Assurance Strategy

The Department has long had a major focus on mitigating risks to high priority DoD facilities and infrastructure and the critical global missions they support. Toward that end, DoD recently adopted an explicit Mission Assurance Strategy, which is focused on ensuring operational continuity in an all-hazard threat environment.

This strategy entails a two-track approach. Track I includes "in-house" mitigation efforts-- activities that the Department can execute largely on its own. A key element is DoD’s Defense Critical Industry Program (DCIP)—an integrated risk management program designed to secure critical assets, infrastructure and key resources for our nation. DoD and the Department of Homeland Security (DHS) work closely together as part of DCIP. Under Track I of the Mission Assurance Strategy, DCIP will continue to update the list of DoD's most critical assets and target them for special mitigation efforts through DoD’s budget and other internal processes.

Track II of our Mission Assurance Strategy tackles the many challenges to DoD mission execution that require external collaboration with partners such as the Department of Energy (DOE), DHS and industry. Given that DoD mission execution relies heavily upon the energy surety of the communities surrounding our installations, Defense Industrial Base facilities spread across entire regions, and on private sector infrastructure that will collapse without electricity, this two-track approach can help meet the challenges to DoD mission assurance that lie far beyond our military bases.

#### DOD’s aware of grid reliance risks and doing everything they can to resolve it

Paul Stockton 11, Assistant Secretary of Defense, Homeland Defense and Americas’ Security Affairs, 5/31/11, Testimony Before the Subcommittee on Energy and Power, The Committee on Energy and Commerce, United States House of Representatives, http://policy.defense.gov/portals/11/Documents/hdasa/ASD(HDASA)\_HECC-EPS\_053111.pdf

The Department of Defense fully recognizes the strategic importance of mitigating the growing risks to the commercial electric power grid, and therefore, the Department is taking affirmative steps internally and externally. Senior leaders are re-focusing some of the Department’s energy security efforts.

Although there are steps the Department can and should take on its own to improve resilience and continuity of operations, achieving more comprehensive electric grid security to ensure critical Department of Defense missions is not something the Department of Defense can do acting alone. Meeting and securing the Department of Defense’s critical electric power needs in an interdependent and increasingly complex risk environment requires a broad scope of collaborative engagement between government and industry stakeholders whose roles and responsibilities in power grid security and resiliency are distributed and shared. While there are maintenance and on-site power surety efforts that need some new focus, for the Department of Defense to succeed in this challenge, leadership and support from industry representatives and interagency partners at various levels of government are imperative.

The Department of Defense is collaborating with the Department of Energy, the Department of Homeland Security, the Federal Energy Regulatory Commission and industry representatives, namely the North American Electric Reliability Corporation, in these matters. For example, we are planning to develop a combined kinetic and cyber threat-based scenario for the U.S. electric power grid that could be applied on a regional scale throughout the country and be used to support the development of a new system "design basis" for building additional resilience in the U.S. electric power grid. We are also working with the North American Electric Reliability Corporation on planning a case study of a military installation for analysis, paired up with the local utility provider to determine what can be done in the short-term to mitigate electric power vulnerabilities and risks. The Department is also participating in exercises such as the recent National Level Exercise-11 exercise and upcoming Departments of Homeland Security, Energy and Defense sponsored Secure Grid 2011 and the North American Electric Reliability Corporation’s GridEx 2011.

These partnerships will help the Department of Defense achieve greater energy grid security and resiliency and help mitigate the risks to critical Department of Defense installations and facilities of commercial power outages.

Department of Defense Efforts Underway

The Department of Defense is making organizational changes and capability improvements that address electric power reliability and security issues and that enable better risk-informed decision-making and investments.

This year the Department of Defense submitted a report to Congress under Section 335 of the 2009 National Defense Authorization Act. Section 335 requires the Department to submit an annual report to Congress on efforts to mitigate the risks posed to Department of Defense mission critical installations, facilities, and activities by extended power outages resulting from failure of the commercial electricity supply or grid and related infrastructure. Congress enacted Section 335 of the National Defense Authorization Act in response to the publication of a 2008 Report by the Defense Science Board on the Department of Defense Energy Strategy, titled “More Fight, Less Fuel.” The report found that “critical national security and homeland defense missions are at an unacceptably high risk of extended outage from failure of the [commercial electrical power] grid” upon which Department of Defense overwhelmingly relies for its electrical power supplies.1

I would like to highlight several Department of Defense initiative that serve to foster improvements in electric grid security.

### Arctic Defense

XX Barsh --- cooping, peace

XX Axe – no escalation

#### No conflict – arctic cooperation is increasing

Fries 12 [Tom Fries, Nonresident Senior Fellow at the Arctic Institute, Apr 18 2012, “Perspective Correction: How We Misinterpret Arctic Conflict,” http://www.thearcticinstitute.org/2012/04/perspective-correction-how-we.html]

War and conflict sell papers -- the prospect of war, current wars, remembrance of wars past. Accordingly, a growing cottage industry devotes itself to writing about the prospect of conflict among the Arctic nations and between those nations and non-Arctic states, which is mostly code for “China.” As a follower of Arctic news, I see this every day, all the time: eight articles last week, five more already this week from the Moscow Times, Scientific American or what-have-you. Sometimes this future conflict is portrayed as a political battle, sometimes military, but the portrayals of the states involved are cartoonish, Cold-War-ish...it’s all good guys and bad guys.

I’m convinced that this is nonsense, and I feel vindicated when I see the extent to which these countries' militaries collaborate in the high North. From last week's meeting of all eight Arctic nations' military top brass (excepting only the US; we were represented by General Charles Jacoby, head of NORAD and USNORTHCOM) to Russia-Norway collaboration on search & rescue; from US-Canada joint military exercises to US-Russia shared research in the Barents...no matter where you look, the arc of this relationship bends towards cooperation.

#### Past trends prove – cooperation is more likely

Fries 12 [Tom Fries, Nonresident Senior Fellow at the Arctic Institute, Apr 18 2012, “Perspective Correction: How We Misinterpret Arctic Conflict,” http://www.thearcticinstitute.org/2012/04/perspective-correction-how-we.html]

It’s not only the handcuffs of many colors worn by the Arctic states that will keep them from getting aggressive, it is also the good precedents that exist for cooperation here. Russia and Norway recently resolved a forty year-old dispute over territory in the Barents. There are regular examples of military cooperation among the four littoral NATO states and between Norway and Russia. Even the US and Russia are finding opportunities to work together. Meanwhile, the need to develop search-and-rescue capabilities is making cross-border cooperation a necessity for all Arctic actors. There are numerous international research and private-sector ventures, even in areas other than hydrocarbons. These will only grow in importance with time. In fact, it would seem that for many of these countries, the Arctic is a welcome relief - a site where international collaboration is comparatively amicable.

### Unilateralism DA---2NC

### Unilateralism DA---Uniqueness/Link---2NC

#### Only our offense is unique---China won’t oppose U.S. leadership now, but perception of a return to unilateral militarism inspires anti-hegemonic challenge

Larson & Shevchenko 10 – Deborah Welch Larson, Professor of Political Science at the University of California, Los Angeles, and Alexei Shevchenko, Assistant Professor of Political Science at California State University, Fullerton, Spring 2010, “Status Seekers: Chinese and Russian Responses to U.S. Primacy,” International Security, Vol. 34, No. 4, p. 63-95

Against this backdrop of mutual recognition of status, there is little evidence that China is engaging in social competition with the United States. Some observers have suggested that China is using regional multilateral organizations to undermine U.S influence and alliance systems in Asia.131 On the other hand, these regional bodies are informal, consensus based, and impose no commitments. Most members also want to maintain good relations with the United States.132 China has increased its defense budget by double digits over the past two decades, but its military acquisitions and spending levels do not indicate that it aspires to be a peer competitor with the United States. China’s military acquisitions (submarines, fighter aircraft, and surface-to-air missiles) appear to be aimed at deterring Taiwan from declaring independence and at deterring, delaying, or denying U.S. support for the island. China does not have global power projection capabilities, as indicated by its lack of aircraft carriers or long-range bombers.133

The need for social cooperation in dealing with rising powers is illustrated by tensions in Sino-Japanese relations despite burgeoning economic ties. China and Japan have never been great powers at the same time and have not learned to respect the other’s status as an equal. Since the mid-1990s, Sino- Japanese relations have been embroiled over symbolic issues such as Japanese textbooks’ treatment of Japan’sWorldWar II atrocities, whether Japanese leaders should issue a written apology, and Japanese politicians’ visits to the Yasukuni Shrine, where Japanese war criminals are interred. Chinese nationalism exploded with Japan’s 2004–05 campaign for a permanent seat on the UN Security Council. More than 40 million Chinese signed an online petition opposing Japan’s application, citing its failure to atone for itsWorldWar II atrocities. In April 2005, news that the Japanese education ministry had approved a new revisionist textbook provoked violent protests against Japanese citizens and property across China. Chinese authorities initially made no attempt to control the disturbances, even though Japan was China’s second-largest trading partner and a major source of foreign investment.134

In sum, China has increasingly taken on a more activist, constructive world role that includes increased support for multilateralism, a policy that has reassured other states, enhanced China’s global role, and increased its relative status. Nevertheless, the United States must remain attentive to China’s status concerns, because Beijing is increasingly sensitive about its relative position and role in international gatherings such as the newly important G-20 and to the U.S. naval presence in Chinese coastal waters, claiming the area as part of its sphere of influence.135

### Unilateralism DA---Legitimacy Impact---2NC

#### Unilateralism collapses the legitimacy of U.S. leadership---that’s the vital internal link to making hegemony effective

Finnemore 9 – Martha Finnemore, professor of political science and international affairs at George Washington University, January 2009, “Legitimacy, Hypocrisy, and the Social Structure of Unipolarity: Why Being a Unipole Isn’t All It’s Cracked Up to Be,” World Politics, Volume 61, Number 1

Legitimacy is, by its nature, a social and relational phenomenon. One’s position or power cannot be legitimate in a vacuum. The concept only has meaning in a particular social context. Actors, even unipoles, cannot create legitimacy unilaterally. Legitimacy can only be given by others. It is conferred either by peers, as when great powers accept or reject the actions of another power, or by those upon whom power is exercised. Reasons to confer legitimacy have varied throughout history. Tradition, blood, and claims of divine right have all provided reasons to confer legitimacy, although in contemporary politics conformity with [End Page 61] international norms and law is more influential in determining which actors and actions will be accepted as legitimate. 9

Recognizing the legitimacy of power does not mean these others necessarily like the powerful or their policies, but it implies at least tacit acceptance of the social structure in which power is exercised. One may not like the inequalities of global capitalism but still believe that markets are the only realistic or likely way to organize successful economic growth. One may not like the P5 vetoes of the Security Council but still understand that the United Nations cannot exist without this concession to power asymmetries. We can see the importance of legitimacy by thinking about its absence. Active rejection of social structures and the withdrawal of recognition of their legitimacy create a crisis. In domestic politics, regimes suffering legitimacy crises face resistance, whether passive or active and armed. Internationally, systems suffering legitimacy crises tend to be violent and noncooperative. Post-Reformation Europe might be an example of such a system. Without at least tacit acceptance of power’s legitimacy, the wheels of international social life get derailed. Material force alone remains to impose order, and order creation or maintenance by that means is difficult, even under unipolarity. Successful and stable orders require the grease of some legitimation structure to persist and prosper.10

The social and relational character of legitimacy thus strongly colors the nature of any unipolar order and the kinds of orders a unipole can construct. Yes, unipoles can impose their will, but only to an extent. The willingness of others to recognize the legitimacy of a unipole’s actions and defer to its wishes or judgment shapes the character of the order that will emerge. Unipolar power without any underlying legitimacy will have a very particular character. The unipole’s policies will meet with resistance, either active or passive, at every turn. Cooperation will be induced only through material quid pro quo payoffs. Trust will be thin to nonexistent. This is obviously an expensive system to run and few unipoles have tried to do so.

Legitimacy’s on-balance more important to overall unipolarity and great power stability than economic or military hard power

Finnemore 9 – Martha Finnemore, professor of political science and international affairs at George Washington University, January 2009, “Legitimacy, Hypocrisy, and the Social Structure of Unipolarity: Why Being a Unipole Isn’t All It’s Cracked Up to Be,” World Politics, Volume 61, Number 1

The strength of a unipolar system depends heavily, not just on the unipole’s material capabilities, but also on the social system in which unipolarity is embedded. Unipoles can shape that system at least to some degree. They can portray themselves as champions of universal values that appeal to other states and other publics. They can invest in the building of norms or institutions in which they believe and from [End Page 83] which they will benefit. The U.S. was remarkably effective at this in the years following WWII. Within its own sphere of influence under bipolarity, the U.S. was a vocal (if not always consistent) proponent of freedom, democracy, and human rights. It built an extended institutional architecture designed to shape global politics in ways that both served its interests and propagated its values. So successful was the U.S. at legitimating and institutionalizing its power, that by the time the Berlin Wall fell, other models of political and economic organization had largely disappeared. The U.S.-favored liberal model of free markets and democracy became the model of choice for states around the world not through overt U.S. coercion, but in significant part because states and publics had accepted it as the best (ergo most legitimate) way to run a country.

Constructing a social system that legitimates preferred values can grease the wheels of unipolar power by inducing cooperation or at least acquiescence from others, but legitimacy’s assistance comes at a price. The process by which a unipole’s power is legitimated fundamentally alters the social fabric of politics. Successful legitimation persuades people that the unipole will serve some set of values. Those persuaded may include publics in the unipolar state, foreign states and publics, and even decision makers in the unipole itself. Legitimacy can thus constrain unipoles, creating resistance to policies deemed illegitimate. Voters may punish leaders at the next election; allies may withhold support for favored policies. But legitimacy can also have a more profound effect—it can change what unipoles want. To the extent that unipole leaders and publics are sincere, they will conform to legitimacy standards because they believe in them. Institutionalizing power similarly changes the political playing field. It creates new authoritative actors (intergovernmental organizations) that make rules, create programs, and make decisions based on the values they embody—values given to them in no small part by the unipole.

Legitimacy is invaluable to unipoles. Creating a robust international order is all but impossible without it and unipoles will bend over backward to secure it since great power demands great legitimacy. At the same time, service to the values that legitimate its power and institutions may be inconvenient for unipoles; examples of hypocritical behavior are never hard to find among the powerful. Hypocrisy varies in degree and kind, however, and the price a unipole pays for it will vary accordingly. Simple opportunism will be appropriately condemned by those who judge a unipole’s actions, but other kinds of hypocrisy may provoke more mixed reactions. Like any social system, the one constructed [End Page 84] by a unipole is bound to contain contradictions. Tragic choices created by conflict among widely shared values will be unavoidable and may evoke some sympathy. Balancing these contradictions and maintaining the legitimacy of its power requires at least as much attention from a unipole as building armies or bank accounts.

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### Aliens

#### Space exploration will lead to alien contact

Daily Galaxy 11 [‘Weekend Feature: 'Endeavour' Astronauts on Extraterrestrial Life -- "We'll find something out there."’, May 29th, 2011, http://www.dailygalaxy.com/my\_weblog/2011/05/-weekend-feature-endeavour-astronauts-on-extraterrestrial-life-well-find-something-out-there.html]

The human race will find life elsewhere in the Universe as it pushes ahead with space exploration, reported astronauts of the space shuttle Endeavour. The US space shuttle Endeavour prepares today to undock from the International Space Station and jet back to Earth, wrapping up its final journey before entering retirement, NASA said. "If we push back boundaries far enough, I'm sure eventually we'll find something out there," said Mike Foreman, a mission specialist on the Endeavour, "Maybe not as evolved as we are, but it's hard to believe that there is not life somewhere else in this great Universe," he added. “I personally believe that we are going to find something that we can't explain," said another astronaut, Gregory Johnson. "There is probably something out there but I've never seen it," he said. Dominic Gorie, the crew commander and veteran of four space flights, points out that explorers in past eras did not know what they would find before setting off across the ocean. "As we travel in the space, we don't know what we'll find. That's the beauty of what we do. I hope that someday we'll find what we don't understand." Takao Doi, a Japanese astronaut on past Endeavour missions, agreed "life like us must exist" elsewhere in the Universe. The comments come after a surprisingly high-level debate in Japan about UFOs. Japan's Foreign Minister, Nobutaka Machimura said in 2007 that he personally believed aliens existed, in an unusual rebuttal to a government statement that Japan had no knowledge of UFOs. Defence Minister Shigeru Ishiba went as far as to say that he was studying the legal ramifications of responding to an alien attack in light of Japan's post-World War II pacifist constitution. At the celebration marking the 50th anniversary of NASA, Stephen Hawking, Newton's heir as the Lucasian Professor of Mathematics at the University of Cambridge, answered the question, “Are we alone?” His answer is short and simple; probably not!

#### Aliens would wipe out humans—they want our resources

Leake 10 [Jonathan, Journalist, “Don’t talk to aliens, warns Stephen Hawking”, April 25th, 2010, http://www.timesonline.co.uk/tol/news/science/space/article7107207.ece]

THE aliens are out there and Earth had better watch out, at least according to Stephen Hawking. He has suggested that extraterrestrials are almost certain to exist — but that instead of seeking them out, humanity should be doing all it that can to avoid any contact. The suggestions come in a new documentary series in which Hawking, one of the world’s leading scientists, will set out his latest thinking on some of the universe’s greatest mysteries. Alien life, he will suggest, is almost certain to exist in many other parts of the universe: not just in planets, but perhaps in the centre of stars or even floating in interplanetary space. Hawking’s logic on aliens is, for him, unusually simple. The universe, he points out, has 100 billion galaxies, each containing hundreds of millions of stars. In such a big place, Earth is unlikely to be the only planet where life has evolved. “To my mathematical brain, the numbers alone make thinking about aliens perfectly rational,” he said. “The real challenge is to work out what aliens might actually be like.” The answer, he suggests, is that most of it will be the equivalent of microbes or simple animals — the sort of life that has dominated Earth for most of its history. One scene in his documentary for the Discovery Channel shows herds of two-legged herbivores browsing on an alien cliff-face where they are picked off by flying, yellow lizard-like predators. Another shows glowing fluorescent aquatic animals forming vast shoals in the oceans thought to underlie the thick ice coating Europa, one of the moons of Jupiter. Such scenes are speculative, but Hawking uses them to lead on to a serious point: that a few life forms could be intelligent and pose a threat. Hawking believes that contact with such a species could be devastating for humanity. He suggests that aliens might simply raid Earth for its resources and then move on: “We only have to look at ourselves to see how intelligent life might develop into something we wouldn’t want to meet. I imagine they might exist in massive ships, having used up all the resources from their home planet. Such advanced aliens would perhaps become nomads, looking to conquer and colonise whatever planets they can reach.” He concludes that trying to make contact with alien races is “a little too risky”. He said: “If aliens ever visit us, I think the outcome would be much as when Christopher Columbus first landed in America, which didn’t turn out very well for the Native Americans.” The completion of the documentary marks a triumph for Hawking, now 68, who is paralysed by motor neurone disease and has very limited powers of communication. The project took him and his producers three years, during which he insisted on rewriting large chunks of the script and checking the filming.

#### Computer models prove thousands of likely alien civilizations

Powlowski 09 (CNN Science and Tech blogger, A. Powlowski “Galaxy May be full of ‘Earths,’ Alien Life”, http://www.cnn.com/2009/TECH/space/02/25/galaxy.planets.kepler/index.html)

Other scientists are taking another approach: an analysis that suggests there could be hundreds, even thousands, of intelligent civilizations in the Milky Way. Researchers at the University of Edinburgh in Scotland constructed a computer model to create a synthetic galaxy with billions of stars and planets. They then studied how life evolved under various conditions in this virtual world, using a supercomputer to crunch the results. Source: Space.com In a paper published recently in the International Journal of Astrobiology, the researchers concluded that based on what they saw, at least 361 intelligent civilizations have emerged in the Milky Way since its creation, and as many as 38,000 may have formed. Duncan Forgan, a doctoral candidate at the university who led the study, said he was surprised by the hardiness of life on these other worlds. "The computer model takes into account what we refer to as resetting or extinction events. The classic example is the asteroid impact that may have wiped out the dinosaurs," Forgan said. "I half-expected these events to disallow the rise of intelligence, and yet civilizations seemed to flourish."

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#### Exploration increases the chance of detection

Wachtel 10 [Jonathan, international broadcast journalist, “U.N. and Aliens”, October 14th, 2010, http://liveshots.blogs.foxnews.com/2010/10/14/u-n-and-aliens/]

We Earthlings are poorly prepared to respond should there be contact from aliens, according to the director of the United Nations Office for Outer Space Affairs (UNOOSA). “Statistically, extraterrestrial life is a possibility,” Malaysian astrophysicist, Mazlan Othman, told journalists in New York, where she is attending a General Assembly meeting on cooperation in the peaceful use of outer space. Othman says solar systems of planets around stars are constantly being discovered and when considering the billions of stars in space, “we could find life,” though when discussing extraterrestrial life, it is “not always green aliens with large lovely eyes, but most likely bacteria.” Othman concedes that she is not an expert on extraterrestrial life, but points out that as space exploration improves, its detection becomes more likely. She believes that the world must come together to lay out a plan for how to cope with such a discovery. She says it makes sense for the U.N. and its member states to determine who should represent humanity if aliens come to our planet. UNOOSA is charged with promoting international coordination of space exploration, satellites, and the tracking and development of a unified response to threats from asteroids, meteors and space debris. It also formulates laws and guidelines on the peaceful use of outer space.

#### Aliens exist—qualified consensus confirms

Pelletier 08 (Dick, “ ETs could resemble us in looks, minds and spirituality, experts say” Positive Future, <http://www.positivefuturist.com/archive/359.html>

In spite of the fact that telescopes have yet to reveal any planets harboring ETs, many forward-thinking scientists believe that intelligent life in the universe is a common occurrence. Physicist Freeman Dyson believes that in a sense, the universe even acknowledges life as one of its components. Dyson believes that matter and energy get fast-tracked along the road to life by what's referred to as "self-organization." Other experts see a kind of Darwinian evolution on countless numbers of planets; setting gears in motion for advanced organic life to one day assume control of their developing worlds. Nobel laureate biochemist Christian de Duve believes that as the universe evolves, it creates ecosystems that allow planets to generate new life

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and minds, which frequently gives birth to thinking beings, able to discern truth, enjoy beauty, feel love, understand good and evil, and experience mystery. Simon Conway Morris, Professor of Evolutionary Paleobiology at Cambridge University makes a strong case that human-like intelligent life may be thriving throughout the universe. In his recent book, Life's Solution, Morris writes, evolution dictates that the "humanlike niche" could emerge on other planets. He even argues that ETs may appear humanoid in form and practice similar spiritual beliefs

#### Even if the aliens are peaceful, technology they give us will cause extinction

Brin 02 (David, Ph.D. in applied physics @ UC San Diego, NASA consultant, "A Contrarian Perspective on Altruism: The Dangers of First Contact,” http://www.setileague.org/iaaseti/brin.pdf)

How about those wonders of technology we hope to acquire, once we begin learning under the remote tutelage of our wise, beneficent predecessors? There has been talk about solving many of the problems that dog us -- e.g. energy crises, disease and unsafe transportation -- by sharing solutions that were discovered long ago by others out there. They might even know answers to biological and sociological quandaries which today threaten our very survival. For now, let’s put aside the interesting philosophical question of whether we’d be better off earning our rightful place, instead of becoming dependent on technological crumbs, like beggars at a banquet. That is a serious question, but I don’t expect it to receive a congenial hearing here. Suppose we do start receiving a wad of generous schematics for all sorts of wonders. What if they are technologies we're not ready for? Like a simple way to make antimatter, using common household materials and wall current? Ninety nine point nine percent of the population may behave responsibly and refrain from blowing us up. The remaining 0.1% would kill us all.

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### Disease

#### Space colonization leads to rapid growth of incurable diseases—extinction

Wickramasinghe 10 (Chandra, Ph.D., Centre for Astrobiology, Cardiff University, UK; Journal of Cosmology, “Are Intelligent Aliens a Threat to Humanity? Diseases (Viruses, Bacteria) From Space”, May 2010, http://journalofcosmology.com/Aliens106.html)

The real risk to humanity of alien life may be in the form of viral and bacterial genomes arriving at the Earth which are sometimes pathogenic (Joseph and Wickramasinghe 2010). Fred Hoyle and the present author have argued the thesis of “Diseases from Space” over several decades (Hoyle and Wickramasinghe, 1979, 1982, 1990; Hoyle et al, 1985; Wickramasinghe et al, 2003). Despite criticisms that have often been made against this concept the basic arguments remain cogent to the present day (Joseph and Wickramasinghe 2010). With increasing evidence to support the view that life could not have arisen indigenously on the Earth, the idea that the evolution of life is modulated by genes arriving from comets has acquired a new significance. Darwinian evolution operates in an open system where new genes continue to be added from a cosmic source. Pandemics of viral and bacterial disease become an inevitable part of this thesis. One could argue that if not for such genetic additions from outside, evolution would have come to a standstill a long time ago (Hoyle and Wickramasinghe, 1982; Joseph and Wickramasinghe 2010). In this context it should be noted that the human genome has recently been found to contain more than 50 percent of its content in the form of well defined inert viral genes. It is possible to understand this data if our ancestral line of descent over a few million years had suffered a succession of near-culling events following outbreaks of viral pandemics (Joseph and Wickramasinghe 2010). On each such occasion only a small breeding group survived the members of which had assimilated the virus into their reproductive line. Hoyle and the present author have cited numerous instances from the history of medicine where outbreaks of pandemic disease could be elegantly explained in terms of space incident viruses. Even the modern scourge of influenza is likely to be driven by periodic injections of genetic components from space. Aspects of the epidemiology of influenza otherwise remains difficult to explain (Hoyle and Wickramasinghe, 1979, 1991). In conclusion, we note that the aliens we have to fear are not superintelligent creatures arriving in space ships and intending to conquer and subdue us, but sub-micron sized viral invaders that may threaten the very existence of our species.

#### Their impact evidence doesn’t assume new diseases

AMNH 98 **–** The American Museum of Natural History, 98 [“ How did Hyperdisease cause extinctions?”, 1998, http://www.amnh.org/science/biodiversity/extinction/Day1/disease/Bit2.html]

It is well known that lethal diseases can have a profound effect on species' population size and structure. However, it is generally accepted that the principal populational effects of disease are acute--that is, short-term. In other words, although a species many suffer substantial loss from the effects of a given highly infectious disease at a given time, the facts indicate that natural populations tend to bounce back after the period of high losses. Thus, disease as a primary cause of extinction seems implausible. However, this is the normal case, where the disease-provoking pathogen and its host have had a long relationship. Ordinarily, it is not in the pathogens interest to rapidly kill off large numbers of individuals in its host species, because that might imperil its own survival. Disease theorists long ago expressed the idea that pathogens tend to evolve toward a "benign" state of affairs with their hosts, which means in practice that they continue to infect, but tend not to kill (or at least not rapidly). A very good reason for suspecting this to be an accurate view of pathogen-host relationships is that individuals with few or no genetic defenses against a particular pathogen will be maintained within the host population, thus ensuring the pathogen's ultimate survival. But diseases don't always do what is expected. In recent decades, we have gained much experience with, and some understanding of, "new" or "emerging" diseases. Emerging diseases may be defined as ones that have only recently appeared in a host species. In general, they are caused by viruses or bacteria that have managed to cross a species boundary from their original host to a new one. AIDS is perhaps the current archetypal example of this: the immunodeficiency virus that infects humans is clearly derived from one or more strains of SIDV (simian immunodeficiency virus) infecting certain species of African monkeys. The transfer event probably occurred in the 1950s, perhaps a little earlier, but it is clear that AIDS is a new human disease. There are a number of other emerging diseases in humans. Although they are caused in several different ways, from our standpoint the most significant thing about them is that they are usually not "benign" by anyone's definition. In effect, they have not sorted out their living arrangements with their hosts yet, and are often extremely virulent. Although there is no predicting when a population will be challenged by a "new" disease, one of the ways in which the transfer occurs is when two species that were not previously in contact come suddenly into proximity. A good example of this in a nonhuman context is the introduction of rinderpest into African ungulates at the end of the 19th century. Rinderpest, which is in the same family as human measles, had originally appeared in Asian ungulates, and had long since evolved into a benign parasite-host relationship involving domesticated Asian cattle. Asian cattle were imported in large numbers into East Africa in the 1890s; some individuals evidently came with rinderpest infections. The virus causing rinderpest transferred to a variety of African bovids, causing immense carnage within the period of a few decades. Although no species was completely wiped out, some hartebeest species probably lost 80% of their populations. Scientists believe that disease may have been largely or exclusively responsible for a few of the mammal and bird extinctions occurring on the planet in the last 500 years, but the number is not large. However, things may have been very different in prehistoric times, especially in the case of many islands. From an epidemiological point of view, the world's islands were like isolation chambers. When people arrived for the first time, the chambers were opened to all kinds of foreign influences almost overnight. And, MacPhee and Marx argue, when the floodgates were opened, along with the rats, mice, pigs, dogs and so on came pathogens to which local species had never been exposed previously. In Madagascar, for example, we are fairly certain that substantial colonization did not begin until about 2,000 years ago. By AD 500, the island had lost about two dozen megafaunal vertebrates, including gorilla-sized lemurs and half-ton elephantbirds. There is virtually no sign of human hunting in the archeological record. Did the species die out because of introduced diseases? The hyperdisease hypothesis relies on many of the same observations that tend to support the overkill hypothesis, but arranges them differently and, of course, gives no primacy to human hunting as a cause of extinction Thus, MacPhee and Marx are on the same side of the "early first Americans" argument that Martin is. Because the disease argument only works during the period that the pathogen is extremely virulent (before it enters into a benign state with respect to its new hosts), they couple first human arrival with the sudden onset of extinctions. A very protracted period of human occupation would be essentially inconsistent with the hyperdisease model. They also argue that the survival of large mammals in Africa is well explained by the notion of co-evolution, but in this case the co-evolution involved the disease pool: humans (and pre-humans) and African mammals had been exposed to, and traded off, similar series of diseases for millions of years. Some of the same objections made to overkill apply to hyperdisease. If the faunal collapse was so extremely sudden, as it has to have been for the disease hypothesis to make sense, where is the body count? If mammal species were going back and forth across the Bering land bridge all the time during the last 65 million years, as the fossil record demonstrates, why did the explosion of extinctions have to await the arrival of humans? Were humans really the original host of the hyperdisease pathogens, and, if so, what is the identity of these killers?

**New diseases result in extinction.**

Souden 2k (David, former Research Fellow in History at Emmanuel College, Cambridge, consultant to the Cambridge Group for the History of Population and Social Structure, “Killer Diseases,” Factsheet, http://darrendixon.supanet.com/killerdiseases.htm)

Nature's ability to adapt is amazing - but the consequences of that adaptation are that mutations of old diseases, we thought were long gone, may come back to haunt us. But of all these new and old diseases, AIDS poses the greatest threat. It has the capacity to mutate and evolve into new forms, and the treatments that are being developed have to take account of that. Yet the recent history of life-threatening and lethal diseases suggests that even if we conquer this disease, and all the others described here, there may be yet another dangerous micro-organism waiting in the wings. The golden age of conquering disease may be drawing to an end. Modern life, particularly increased mobility, is facilitating the spread of viruses. In fact, some experts believe it will be a virus that leads to the eventual extinction of the human race.

### Weaponization

#### Colonization causes arms races

Bailey 6 (Jonathan, read history @ U of Oxford, Dec 20, [www.idebate.org/debatabase/topic\_details.php?topicID=324]

Sending humans into spaceor to other planets so that they can erect the flag of a particular nation is a distinctly nationalistic act and one that is likely to **create aggressive 'races'** in the future just as it has before. China’s manned programme is openly intended to challenge the US dominance of space for the Communist regime’s huge propaganda benefit. George W. Bush’s pledge to boost spending on NASA and to restart the manned mission to Mars programme was a direct response. This is damaging not only because of the potential for space race conflicts to escalate **into greater international hostility**, but also because of the way such races could **result in the militarization of space** (as several Chinese hawks have called on the leadership to do), thereby turning something which should be preserved for the common good of humankind into a **neo-colonial battlefield.**

#### Space weaponization causes accidental nuclear war

Mitchell 1 – “Japan-U.S. Missile Defense Collaboration: Rhetorically Delicious, Deceptively Dangerous” by Gordon R. Mitchell, Member of the Center for Strategic and International Studies Working Group on Theater Missile Defenses in the Asia-Pacific Region., Winter 2001, <http://www.pitt.edu/~gordonm/JPubs/JapanTMD.pdf>

A buildup of space weapons with capability to execute offensive missions might begin with noble intentions of “peace through strength” deterrence, but this rationale glosses over the tendency that “…**the presence of space weapons…will result in the increased likelihood of their use.”**65 Military commanders desiring to harness the precision strike capability afforded by spacebased “smart” weapons might order deliberate attacks on enemy ground targets in a crisis. The dizzyingspeed of space warfare would introduce intense **“use or lose” pressure** into strategic calculations, with the specter of split-second laser attacks creating incentives to rig orbiting death stars with automated **“hair trigger” devices.** In theory, this automation would enhance survivability of vulnerable space weapon platforms. However, by taking the decision to commit violence out of human hands and endowing computers with authority to make war, military planners could sow insidious seeds of **accidental conflict** Yale sociologist Charles Perrow has analyzed “complexly interactive, tightly coupled” industrial systems, which have many sophisticated components that all depend on each other’s flawless performance. According to Perrow, this interlocking complexity makes it impossible to foresee all the different ways such systems could fail. He further explains, “[t]he odd term ‘normal accident’ is meant to signal that, given the system characteristics, multiple and unexpected interactions of **failures are inevitable** 66 Deployment of space weapons with pre-delegated authority to fire death rays or unleash killer projectiles would likely **make war itself inevitable**, given the susceptibility of such systems to “normal accidents.” It is chilling to contemplate the possible effects of a space war. According to Bowman, “even a tiny projectile reentering from space strikes the earth with such high velocity that it can do enormous damage—**even more than would be done by a nuclear weapon of the same size!”**67 In the same laser technology touted by President Reagan as the quintessential tool of peace, David Langford sees one of the most wicked offensive weapons ever conceived: “One imagines dead cities of microwave-grilled people.”68 Given this unique potential for destruction, it is not hard to imagine that any nation subjected to a space weapon attack would **escalate by retaliating with maximum force, including use of nuclear, biological, and/or chemical weapons.** An accidental war sparked by a computer glitch in space could plunge the world into the **most destructive military conflict ever seen.**

#### Weaponization destroys the environment and triggers every impact

Maogoto & Freeland 8 – Jackson Nyamuya Maogoto, Senior Lecturer in International Law, University of Newcastle, \*\*AND Steven Freeland, Associate Professor in International Law, University of Western Sydney (Australia); Visiting Professor of International Law, University of Copenhagen, (Denmark); Member of the Space Law Committee of the International Law Association; Member of the International Institute of Space Law. "From Star Wars to Space Wars - the next strategic frontier: paradigms to anchor space security," January 1st, 2008, Journal of Air and Space Law, Volume 33, pp. 35

Because of its uniquely commanding height, outer space has gained even greater military and strategic value in the post-cold-war international strategic environment. This provides for the possibility that outer space will become a platform for warfare. This development will **only result in negative consequences.** It will disrupt **global strategic balances** and stability, **undermine international and national security** and harm existing **arms control** arrangements, in particular those related to nuclear weapons and missiles. All of these will inexorably trigger a **new arms race**

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— the symptoms of which we are already witnessing. In addition, the deployment and use of space weapons will seriously threaten the security of space assets and risks causing

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**irreversible harm to the biosphere of the earth.** A common sense approach will not unduly jeopardize the economic and strategic interests of those States utilizing space technology, but will make it clear that there are strict binding limits as to how far and for what purposes this technology can be implemented.

#### Space weapons kill hegemony – it leads to balancing and destroys military flexibility

Hitchens 2 – Theresa Hitchens is Director of the Center for Defense Information, and leads its Space Security Project, in cooperation with the SecureWorld Foundation. Editor of Defense News from 1998 to 2000, Hitchens has had a long career in journalism, with a focus on military, defense industry and NATO affairs. She also was director of research at the British American Security Information Council. Hitchens serves on the editorial board of The Bulletin of the Atomic Scientists, and is a member of Women in International Security and the International Institute for Strategic Studies. April 18th, 2002, "Weapons in Space: Silver Bullet or Russian Roulette? The Policy Implications of U.S. Pursuit of Space-Based Weapons," [www.cdi.org/missile-defense/spaceweapons.cfm](http://www.cdi.org/missile-defense/spaceweapons.cfm)

Karl Mueller, now at RAND, in an analysis for the School of Advanced Airpower Studies at Maxwell Air Force Base, wrote, "The United States would **not be able to maintain unchallenged hegemony in the weaponization of space,** and while a space-weapons race would threaten international stability, it would be even more dangerous to U.S. security and relative **power projection capability**, due to other states' significant ability and probably inclination to balance symmetrically and asymmetrically against ascendant U.S. power."[31](http://www.cdi.org/missile-defense/spaceweapons.cfm%22%20%5Cl%20%22_ftn31%22%20%5Co%20%22) Spurring other nations to acquire space-based weapons of their own, especially weapons aimed at terrestrial targets, would certainly **undercut the ability of U.S. forces to operate freely on the ground**

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on a worldwide basis — negating what today is a unique advantage of being a military superpower.[32](http://www.cdi.org/missile-defense/spaceweapons.cfm%22%20%5Cl%20%22_ftn32%22%20%5Co%20%22)  U.S. commercial satellites would also become targets, as well as military assets (especially considering the fact that the U.S. military is heavily reliant on commercial providers, particularly in communications). Depending on how widespread such weapons became, it also could even put U.S. cities at a greater risk than they face today from ballistic

#### SMRs cause a global hub and spoke nuclear trade where only a few countries enrich uranium---that collapses both global enrichment capacity and the technical expertise that supports it---means even if countries wanted to restart enrichment later they couldn’t

Ioannis N. Kessides 12, Lead Economist in the World Bank's Development Research Group, and Vladimir Kuznetsov, Consultant, the World Bank, 2012, “Small Modular Reactors for Enhancing Energy Security in Developing Countries,” Sustainability, Vol. 4, No. 8, p. 1806-1832

The extent to which nuclear power will prove an acceptable and enduring option for meeting the future energy requirements worldwide will depend in part upon the ability of the international community to minimize the associated proliferation risks. A major nuclear expansion program, unless is accompanied by adequate technical and institutional safeguards, could increase the risk that weapons-usable fissile materials, facilities, technology, or expertise might be diverted or stolen. The common fear is that such an expansion will make it easier for countries to acquire technology as a precursor to developing nuclear weapons capability or for terrorist groups to obtain nuclear materials. This risk could be further compounded by the likelihood that plutonium-fueled breeder reactors will be widely used to stretch uranium resources under expanded nuclear power deployment. Enhanced capacity and institutional arrangements to prevent proliferation and diversion of nuclear technology to non-peaceful purposes are challenges that will need to be overcome if nuclear energy is to be expanded in developing countries

One potential way of mitigating the proliferation risks of expanded nuclear deployment in developing countries might be through the adoption of hub-and-spoke configurations that restrict all sensitive activities (such as isotope separation of uranium or reprocessing of spent fuel) to large, international/regional energy parks that would export fuel, hydrogen, and even small (40–50 megawatts) sealed reactors to client states [30,31]. These reactors would be assembled and fueled at the central nuclear park, sealed (so that individual fuel assemblies could not be removed) and delivered as a unit to the power plant cites of client countries. At the end of their core life (say 15–20 years) the reactors would be returned to the central park unopened. Thus, during the 15–20 years of operation there would be no refueling and consequently the client countries would need no fuel fabrication facilities and management capabilities. To the extent that such modular reactors would operate almost autonomously, the hub-and-spoke architecture could reduce substantially the rationale and opportunities for countries to develop nuclear research laboratories and train technical specialists and scientists whose know-how could later be diverted to weapons activities [32]. It should be noted that providing attractive alternatives to the buildup of indigenous facilities is a good idea. However, trying to restrict knowledge diffusion is arguable futile and non-sustainable.

#### The plan locks in an oligarchy of uranium enrichment---that puts a low ceiling on global capacity---shuts down commercially viable projects

Milagros Álvarez-Verdugo 10, Associate Professor of International Law and EU Law, University of Barcelona, 2010, “Will Climate Change Alter the NPT Political Balance? New Challenges for the Non-proliferation Regime,” European Journal of International Law, 21 (1): 205-219

The options analysed show the existence of economic, political, and also legal tensions which, in our view, justify a rethink of the premises whereby these problems should be tackled.

In economic terms, the limited number of countries and companies currently involved in enrichment and/or reprocessing proves that barriers exist preventing access to these markets, due to the technologies and investment needed to set up facilities of this type. As a result, any measure aimed at preventing or limiting new suppliers joining the group would lead to, at least, the strengthening of the situation of oligopoly, which would basically benefit pre-existing companies, in a market where there are also doubts whether these companies really have the capacity to satisfy future demand. At the same time, some countries are openly opposed to proposals aimed at controlling or limiting uranium enrichment capabilities because, they argue, they would prepare the way for the confiscation of sensitive technologies and limit the development of programmes of scientific or commercial interest.33

#### The plan enables U.S. leadership on setting the terms of nuclear agreements

Micah J. Loudermilk 11, Research Associate for the Energy & Environmental Security Policy program with the Institute for National Strategic Studies at National Defense University, 5/31/11, “Small Nuclear Reactors and US Energy Security: Concepts, Capabilities, and Costs,” 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

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.

#### That means the U.S. will successfully pressure states out of developing enrichment---the U.S. wants to apply pressure but it’s ineffective now due to lack of U.S. market leadership

Marianne Nari Fisher 10-18, Stimson Center, “A New Spring In The Middle East? The Emerging Nuclear Energy Renaissance,” 10/18/12, http://www.stimson.org/spotlight/a-new-spring-in-the-middle-east-the-emerging-nuclear-energy-renaissance-/

An understandable reluctance by the international community to encourage and finance start-up nuclear energy programs in a currently volatile Middle East, however, is leading to a new grouping of regional states looking internally for financial and technological support. The US continues efforts to persuade nations beginning commercial nuclear projects to pledge to forego uranium enrichment and plutonium reprocessing -- key elements in converting commercial nuclear enterprises into weapon programs. Yet, sustaining this position may soon lead to loss of US political leadership on the issue, since others, including China, France, and Russia are certainly not reluctant to get involved with these start-up programs in the Middle East without such hard and fast preconditions.

The firm stance held by the US is perpetuated by continued long-standing conflicting policy objectives. US Deputy Secretary of Energy Dan Poneman gave a sense of official priorities in a speech last year at the Nuclear Energy Assembly 2011, where he declared that "in order to succeed, nuclear power must address three other critical challenges: commercial viability, the back end of the fuel cycle, and the risk of nuclear weapons proliferation." Historically, US companies were key players in nuclear energy construction, and there are enduring pressures for the United States to remain engaged in the market and hedge the risk of new nuclear weapons programs. The issue also carries serious economic implications and opportunities, such as broadening markets for US nuclear suppliers that could result in job creation at home, electricity sales, and more.

#### Cradle-to-grave reactor exports prevent the spread of enrichment and puts diplomatic pressure on countries that move toward enrichment

Fred McGoldrick 11, held senior positions in the U.S. Department of Energy and the U.S. Department of State, negotiated U.S. peaceful nuclear cooperation agreements, partner in Bengelsdorf, McGoldrick and Associates, LLC., an international consulting firm, May 2011, “Limiting Transfers of Enrichment and Reprocessing Technology: Issues, Constraints, Options,” http://belfercenter.ksg.harvard.edu/files/MTA-NSG-report-color.pdf

4.3.1 Offering a Broad-based Cradle-to-Grave Fuel Cycle Service.

This option would involve a major diplomatic initiative to explore the possibility that one or more supplier states could offer cradle-to-grave services to all states without E&R plants as an incentive for states to forgo the development of such capabilities.

Advantages

If one or more suppliers could offer a “cradle-to-grave” fuel supply program, it could prove to be far more effective than some other techniques in discouraging the spread of reprocessing facilities. Because the commercial market already provides strong assurance of fresh fuel supply, while management of spent fuel is unresolved, such a service offer could create stronger incentives for countries to rely on international fuel supply than steps such as fuel banks would.

Russia has already implemented such a program on a limited scale. Moscow has concluded an agreement to provide fresh nuclear fuel for the Bushehr nuclear power plant in Iran and to take back the used nuclear fuel to Russia. The Russians have also taken back some spent power reactor fuel from East European countries and have indicated that they might be willing to consider taking back spent fuel of Russian-origin in the future—they have recently offered such deals to Vietnam and Turkey—but do not seem ready to accept spent fuel produced from fuel from non-Russian suppliers.

If Russia were to offer a broad-based a cradle-to-grave program, it may put pressure on its competitors in the reactor and enrichment markets to try to follow suit.

## Enrichment Turn

#### SMRs cause a global hub and spoke nuclear trade where only a few countries enrich uranium---that collapses both global enrichment capacity and the technical expertise that supports it---means even if countries wanted to restart enrichment later they couldn’t

Ioannis N. Kessides 12, Lead Economist in the World Bank's Development Research Group, and Vladimir Kuznetsov, Consultant, the World Bank, 2012, “Small Modular Reactors for Enhancing Energy Security in Developing Countries,” Sustainability, Vol. 4, No. 8, p. 1806-1832

The extent to which nuclear power will prove an acceptable and enduring option for meeting the future energy requirements worldwide will depend in part upon the ability of the international community to minimize the associated proliferation risks. A major nuclear expansion program, unless is accompanied by adequate technical and institutional safeguards, could increase the risk that weapons-usable fissile materials, facilities, technology, or expertise might be diverted or stolen. The common fear is that such an expansion will make it easier for countries to acquire technology as a precursor to developing nuclear weapons capability or for terrorist groups to obtain nuclear materials. This risk could be further compounded by the likelihood that plutonium-fueled breeder reactors will be widely used to stretch uranium resources under expanded nuclear power deployment. Enhanced capacity and institutional arrangements to prevent proliferation and diversion of nuclear technology to non-peaceful purposes are challenges that will need to be overcome if nuclear energy is to be expanded in developing countries

One potential way of mitigating the proliferation risks of expanded nuclear deployment in developing countries might be through the adoption of hub-and-spoke configurations that restrict all sensitive activities (such as isotope separation of uranium or reprocessing of spent fuel) to large, international/regional energy parks that would export fuel, hydrogen, and even small (40–50 megawatts) sealed reactors to client states [30,31]. These reactors would be assembled and fueled at the central nuclear park, sealed (so that individual fuel assemblies could not be removed) and delivered as a unit to the power plant cites of client countries. At the end of their core life (say 15–20 years) the reactors would be returned to the central park unopened. Thus, during the 15–20 years of operation there would be no refueling and consequently the client countries would need no fuel fabrication facilities and management capabilities. To the extent that such modular reactors would operate almost autonomously, the hub-and-spoke architecture could reduce substantially the rationale and opportunities for countries to develop nuclear research laboratories and train technical specialists and scientists whose know-how could later be diverted to weapons activities [32]. It should be noted that providing attractive alternatives to the buildup of indigenous facilities is a good idea. However, trying to restrict knowledge diffusion is arguable futile and non-sustainable.

### Uniqueness---Enrichment Spread---2NC

#### Enrichment will spread globally now---60 countries are increasing nuclear capacity---will provide large global enrichment capacity

Olli Heinonen 12, Senior Fellow, Belfer Center for Science and International Affairs, 3/22/12, “"The Nuclear Non-Proliferation Regime Challenged",” http://belfercenter.ksg.harvard.edu/publication/21850/nuclear\_nonproliferation\_regime\_challenged.html

Let me start by assessing the impact of a nuclear renaissance on non-proliferation efforts. There are currently about 435 nuclear power reactors in the world. According to IAEA estimates[1], 60 countries are considering using nuclear power by 2030 25 of them are countries which do not currently have any nuclear plants. The conservative estimate on the total number of power reactors expected to come online by 2030 is 90[2]. The higher projections is as high as 350 power reactors by 2030. This will have a significant impact to the IAEA program as a whole covering nuclear safety, security, and safeguards.

While the Fukushima nuclear crisis reversed the course of nuclear energy in some countries such as Japan, Germany, and Italy, many other countries, including our host, the Republic of Korea, continue to rely on nuclear energy to power their economies and industry. Nuclear energy continues to remain part of their energy security mix, and expanded nuclear energy growth can be expected to continue, accompanied by more stringent scrutiny given to the “3-Ss”.

So what needs to be done to ensure that nuclear energy is used in a safe, secure and proper manner. There are various ways to mitigate proliferation risks associated with the expansion of nuclear energy, particularly with regard to enrichment and spent-fuel handling, such as providing assurances on fuel supply and developing fuel take back options[3]. The experiences at Fukushima do support the case for a permanent solution to centralized, long-term storage or disposal of spent fuel.

The idea of multinational enrichment centres is an important step, but one that needs to overcome certain hurdles. As things currently stand, there is no shortage of uranium enrichment services. The establishment of multinational enrichment centres (MNC) to politically unstable regions will not be an attraction to technology holders and investors. Technology holders may worry about risks associated with “hijacking” their technologies. We should also keep in our minds that A Q Khan got access to knowhow while serving in a multinational enterprise, URENCO. In other words, while MNCs and new enrichment technologies such as SILEX[4] should be pursued, emphasis should be made in parallel to ensure that there are adequate commercially attractive enrichment services available to minimize the need to build unnecessary enrichment plants. That said, despite whatever incentives offered, a (hopefully) small number of states could still choose to build their own domestic enrichment capabilities. Individual and targeted approaches will be needed to address these cases.

#### Enrichment will spread globally with new nuclear programs---tech development will make it economically viable---but no risk of prolif because new nuclear states will accept safeguard agreements---and, the U.S. will try to prevent enrichment spread, but fail now

Justin Alger 10, researcher at the Canadian Centre for Treaty Compliance (CCTC) at Carleton University in Ottawa, Canada, and Trevor Findlay, the William and Jeanie Barton Chair in International Affairs and director of the CCTC at Carleton’s Norman Paterson School of International Affairs, Fall 2010, “Strengthening Global Nuclear Governance,” Issues in Science & Technology, Vol. 27, No. 1, http://www.issues.org/27.1/alger.html

Because all of the aspiring developing states, along with all other nonnuclear weapon states, are party to the NPT and have comprehensive safeguards agreements, they will be required to apply nuclear safeguards to all of their power reactors and associated facilities. In addition, there will probably be strong pressure on such states to conclude an Additional Protocol to their comprehensive safeguards agreement, making illicit diversion or a hidden clandestine nuclear weapons program more difficult than in the past. Most have, in fact, either signed one or already have one in force. However, key aspiring states—Egypt, Oman, Qatar, Saudi Arabia, Syria, and Venezuela—have not yet signed one, which is of some concern.

The most worrying development would be if the new entrants seek the full nuclear fuel cycle, including uranium enrichment and plutonium reprocessing, which can be used to make reactor fuel or nuclear weapons. Jordan is reportedly resisting the UAE model of foregoing such options, because it may wish to enrich its own domestic uranium resources at some stage rather than relying on others for enrichment services. Turkey has also raised this possibility. One developing country with nuclear power already, Brazil, has its own enrichment plant and is an NPT party but refuses to sign an Additional Protocol. Joint enrichment plans by Argentina and Brazil are being aired. South Korea is pressing the United States to support its plans to reprocess plutonium using an allegedly more proliferation-resistant technology called pyroprocessing.

The quest for energy security is helping legitimize demands for the full fuel cycle. New enrichment technologies such as laser separation may attenuate the current technological and cost barriers. The resistance of key developing states to IAEA and Russian attempts to establish nuclear fuel banks that would provide assurances of supply of nuclear reactor fuel has added to concerns that the future of nuclear energy faces a major political impasse. This is partly driven by anti-Western political gamesmanship by Cuba, Iran, Pakistan, and Syria, but also by genuine developing-country fears that they are being deprived of valuable technological options.

Although the NPT guarantees its parties the “inalienable right to the peaceful uses of nuclear energy,” this is conditional on the acceptance of nuclear safeguards and does not oblige any state to share any particular technology with any other. The United States and other countries, including key members of the G8 and the Nuclear Suppliers Group, are seeking to prevent additional states from acquiring enrichment or reprocessing capabilities, sometimes to the chagrin of even their allies such as Canada. One proposal for resolving this issue over the long term is for the existing possessors of such technology to give up their national capabilities through multilateralization or internationalization of these “sensitive” aspects of the nuclear fuel cycle. Numerous proposals are on the table for pursuing this vision, but its realization would involve enormous compromises on all sides. The issue ultimately reflects the bitter division between the nuclear haves and have-nots that is embedded in the NPT, a resolution of which can come only with the achievement of nuclear disarmament.

### AT: Plan Solves

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#### a) The plan means nuclear energy for all but enrichment for very few---that makes solving warming impossible

Sharon **Squassoni**, senior associate in the Nonproliferation Program at the Carnegie Endowment, former director of Policy Coordination in the Nonproliferation Bureau of the State Department, **2009**, “Nuclear Energy: Rebirth or Resuscitation?,” online: http://www.carnegieendowment.org/files/nuclear\_energy\_rebirth\_resuscitation.pdf

The discussion since 2004 within the Nuclear Suppliers Group (NSG) about new criteria to restrict enrichment and reprocessing transfers illustrates the pitfalls of an approach that promotes nuclear energy for all but only limited nuclear fuel cycles for most. President Bush suggested in February 2004 in a speech at the National Defense University that nuclear suppliers prohibit the transfer of sensitive nuclear technology to states that did not already have those technologies. Since then, the NSG has discussed how to implement that prohibition. So far, several states have been unwilling to be relegated to the “havenot” category, including Canada, one of the largest suppliers of uranium ore. In fact, Canada may move quickly to establish an enrichment capability before the door closes. South Africa may resurrect the enrichment technique it developed for its weapons program or seek centrifuge enrichment technology. Ukraine sought cooperation with foreign partners “to obtain the full cycle of enrichment and production of nuclear fuel” to counter uncertain gas supplies from Russia, but Ukraine had agreed by the end of 2008 to join the Angarsk enrichment joint venture. Although NSG members already followed a policy of restraint on such transfers, the promise of major nuclear expansion appears to be eroding agreement in this area. Additional enrichment capacity in some of these states may not cause alarm, but if they are successful, it may become more difficult to justify why other states should not develop such capabilities.

In light of these difficulties, advanced states have been encouraging other states to voluntarily forswear enrichment and reprocessing as a confidence-building measure. In 2008, the United Arab Emirates released its Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy. Not coincidentally, the Emirates’ foreign minister and U.S. secretary of state Condoleezza Rice signed a memorandum of understanding on peaceful nuclear cooperation the next day (followed by a cooperation agree ment several months later). The Emirates renounced any intention to develop a domestic enrichment and reprocessing capability and reportedly will pass legislation that would criminalize such activities within the country. The policy document cites economic infeasibility of such activities for a small nuclear fleet, international concerns about sensitive fuel cycle capabilities in developing countries, and the dual-use nature of components employed in fuel fabrication and processing. Instead, the Emirates will seek long-term arrangements with governments and contractors.

It is too soon to tell whether a significant number of states will follow in the United Arab Emirates’ footsteps. It is also unclear what consequences would ensue should the Emirates’ voluntary decisions be reversed. One suggestion by the State Department’s International Advisory Board was to reach agreement among suppliers that supply would be cut off if such voluntary decisions were reversed, and that consequences would be clearly spelled out in commercial contracts. This could be particularly difficult to implement. At the very least, such an approach depends on the success of extensive diplomatic negotiations.

Risks of Major Expansion

An expansion of nuclear power large enough to make a significant contribution to climate change mitigation—doubling, tripling, or quadrupling power reactor capacity—would present some of the risks described above, as well as new ones.

As long as light-water reactors remain the technology of choice, doubling or tripling the number of reactors will require more uranium enrichment plants. If all projected plans for power reactors by 2030 are realized, twice as much enriched uranium would need to be produced. Expansion according to climate change scenarios would require three to four times as much uranium enrichment capacity compared with today. If enrichment capabilities in the eleven countries that already enrich uranium were simply expanded, the risk of proliferation would not necessarily grow. But that is an unlikely scenario, given the lack of agreement among suppliers and recipients described above. Countries with significant uranium resources might choose to enrich for export (although the economics of this are not clear), and/or countries with more than ten reactors might find it economically feasible to enrich uranium for their own use. Under a 1,500-GWe capacity scenario, there could be fifteen additional countries that could have an economic justification for enriching their own uranium (with 10 GWe or more of nuclear capacity).

#### c) Even under best case conditions like a carbon tax, the U.S. can only build 37 SMRs annually by 2030

David Solan et al 10, Assistant Professor of Public Policy & Administration and Director of the Energy Policy Institute at Boise State University, et al., June 2010, “Economic and Employment Impacts of Small Modular Nuclear Reactors,” http://epi.boisestate.edu/media/3494/economic%20and%20employment%20impacts%20of%20smrs.pdf

In the low SMR adoption case, there are only two to four SMRs manufactured in the U.S. each year between 2020 and 2030. In this case, the infrastructure to manufacture several SMRs per year in the U.S. may be too expensive to warrant the investment, so this "business-as-usual" case will not lead to a concerted SMR manufacturing effort in the U.S., if only the domestic market is considered.

Both the moderate and high SMR adoption cases assume that some greenhouse gas legislation is passed that penalizes C02 emissions. For these cases, the number of SMRs manufactured in the U.S. increases from 5 to 8 in 2020, to 31 to 37 in 2030. The total number of SMRs operating in the U.S. would increase from 4 to 14 in 2020, to 140 to 215 in 2030.

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#### We control uniqueness – the US has embraced space multilateralism and is advancing an international framework against weaponization now – only a risk the plan disrupts this

Rose 3/1 Frank is the Deputy Assistant Secretary of the State Department’s Bureau of Arms Control. “Space Sustainability Through International Cooperation,” 2012, <http://www.state.gov/t/avc/rls/184897.htm>

Note: UNCOPUOS - UN Committee on the Peaceful Uses of Outer Space

The use of space capabilities during this disaster is one example of how the world is becoming increasingly inter-connected through, and increasingly dependent on, space systems. As a result of the critical benefits it offers, the United States considers the sustainability, stability, and use of space vital to its national interests.¶ There are a number of challenges that have emerged as a result of increased space activity by an unprecedented number of spacefaring nations. As a result, the space activities that have provided us with a multitude of benefits have also created a space environment littered with space debris. Threats to the space environment have also increased as more nations and non-state actors develop and deploy counter-space systems. Today space systems and their supporting infrastructure face a range of man-made threats that may deny, degrade, deceive, disrupt, or destroy assets.¶ The increasingly congested and contested nature of the space environment offers critical challenges, which threatens the long-term sustainability of our space activities, and will continue to present challenges in the decades to come. But this symposium intends not only to discuss challenges, but also opportunities, and in particular, opportunities for international cooperation. Such opportunities include cooperation to mitigate orbital debris, share space situational awareness information, improve information sharing for collision avoidance, and develop transparency and confidence building measures. Today, I will discuss how collaboration in each of these areas has the potential of enhancing the long term sustainability, stability, safety, and security of the space environment.¶ Cooperation to Mitigate Orbital Debris¶ The key issue that we are here to discuss today is the growing presence of debris in space. After 50 years of space exploration and utilization, a comedian might even say there’s not as much space up there as there used to be! But the problem of potentially hazardous debris is not a joke, but rather an increasingly greater and greater danger. As my colleagues from the Department of Defense will discuss later, there are approximately 22,000 pieces of large debris (>~10 cm) in various Earth orbits. Some of this debris is simply “dead” satellites or spent booster upper stages still orbiting. Another type of debris results from accidents or mishaps, such as the 2009 Cosmos-Iridium collision. Other accidents that have occurred are when objects slipped the grasp of our astronauts including a glove, cameras, a wrench, pliers, a tool bag, and even a toothbrush. Still another type of debris results from intentionally destructive events, such as China’s test in space of an anti-satellite weapon in 2007 that intercepted its own weather satellite, thus generating long-lived debris, some of which will not re-enter Earth’s atmosphere for over 100 years.¶ Experts warn that the quantity and density of all of these types of debris significantly increases the odds of future dangerous and damaging collisions. This debris also poses a direct threat to the International Space Station. In fact, less than two months ago, the United States and Russia orchestrated a debris avoidance maneuver of the International Space Station in order to avoid a series of collision threats posed by a fragment of debris created by China’s 2007 anti-satellite weapons test.¶ To address the growing problem of orbital debris, the United States has expanded its engagement within the United Nations and with other governments and non-governmental organizations. We are continuing to lead the development and adoption of international standards to minimize debris, building upon the foundation of the U.N. Space Debris Mitigation Guidelines. I’ll also note that the U.S. guidelines on debris mitigation are even stricter than those that were established by the Inter-Agency Space Debris Coordination Committee and then adopted by the Committee on the Peaceful Uses of Outer Space and endorsed by the United Nations. Space debris is also a topic currently being discussed within the multi-year study of “long-term sustainability” within the Scientific and Technical Subcommittee of the U.N. Committee on the Peaceful Uses of Outer Space, or COPUOS, which I’ll discuss in greater detail later in my remarks.¶ Cooperation in Space Situational Awareness¶ International cooperation is also necessary to ensure that we have robust situational awareness of the space environment. No one nation has the resources or geography necessary to precisely track every space object. The U.S. National Space Policy implicitly recognizes this fact and thus directs us to collaborate with foreign governments, the private sector, and intergovernmental organizations to improve our space situational awareness – specifically, to improve our shared ability to rapidly detect, warn of, characterize, and attribute potential disturbances to space systems, whether natural or man-made.¶ An example of our efforts to cooperate in the area of space situational awareness is our collaboration with Europe as it develops its own space situational awareness, or SSA system. The U.S. State Department, in close collaboration with the U.S. Department of Defense, is currently engaged in technical exchanges with experts from the European Space Agency, European Union, and individual European Space Agency and European Union Member States to ensure interoperability between our two respective SSA systems. Looking ahead, we also see opportunities for cooperation on SSA with our allies and partners in the Asia-Pacific, especially Japan.¶ Cooperation to Prevent Satellite Collisions¶ International cooperation is also essential to enable satellite owners and operators to have the information necessary to prevent collisions in the future. As a result, we are seeking to improve our ability to share information with other space-faring nations as well as with our industry partners. Such cooperation enables us to improve our space object databases as well as pursue common international data standards and data integrity measures.¶ As my colleagues in the Department of Defense will explain, the United States provides notifications to other governments and commercial satellite operators of potentially hazardous conjunctions between orbiting objects. The State Department continues to be extremely supportive of U.S. Strategic Command’s efforts to establish two-way information exchanges with foreign satellite operators and to facilitate the urgent transmission of notifications of potential space hazards.¶ The United States is constantly seeking to improve its ability to share information with other space-faring nations as well as with our commercial sector partners. For example, the Department of State is currently reaching out to all space-faring nations to ensure that the Joint Space Operations Center, or JSpOC, has current contact information for both government and private sector satellite operations centers.¶ Cooperation in Developing TCBMs¶ Another key opportunity to cooperate to enhance the long term sustainability of the space environment is through the development of near-term, voluntary, and pragmatic space transparency and confidence building measures, or TCBMs for short. TCBMs are means by which governments can address challenges and share information with the aim of creating mutual understanding and reducing tensions. TCBMs, also have the potential of enhancing our knowledge of the space environment, by addressing important areas such as orbital debris, space situational awareness, and collision avoidance, as well as undertake activities that will help to increase familiarity and trust and encourage openness among space actors. The United States, as guided by President Obama’s National Space Policy, will work with other space actors to pursue TCBMs to encourage responsible actions in, and the peaceful use of, space.¶ An International Code of Conduct for Outer Space Activities¶ An example of a TCBM to ensure sustainability and security in space could be the adoption of “best practice” guidelines or a “code of conduct.” As many of you are aware, on January 17, 2012, the United States announced that it had decided to join with the European Union and other spacefaring nations to develop an International Code of Conduct for Outer Space Activities. In her statement announcing the decision, Secretary Clinton said, “The long-term sustainability of our space environment is at serious risk from space debris and irresponsible actors. […] Unless the international community addresses these challenges, the environment around our planet will become increasingly hazardous to human spaceflight and satellite systems, which would create damaging consequences for all of us.” We were pleased that Japan, Australia, and other countries have also stated their support for the development of a space Code of Conduct.¶ The United States views the European Union’s draft Code of Conduct as a good foundation for developing a non-legally binding International Code of Conduct focused on the use of voluntary and pragmatic TCBMs to help prevent mishaps, misperceptions, and mistrust in space. As more countries field space capabilities, it is in all of our interests that they act responsibly and that the safety and sustainability of space is protected. An International Code of Conduct, if adopted, would establish a political commitment not to conduct debris-generating events and would increase the transparency of operations in space to avoid the danger of collisions.¶ I want to stress that the Obama Administration is committed to ensuring that an International Code enhances national security and maintains the United States’ inherent right of individual and collective self-defense, a fundamental part of international law. That said, we would encourage spacefaring nations to consider playing an active role as we prepare to multilaterally discuss a Code of Conduct. All spacefaring nations, both established and emerging, will have the opportunity to participate actively in multilateral meetings of experts in 2012 that the European Union will schedule. We look forward to engaging with you on this initiative in the months to come.¶ Group of Government Experts on Outer Space TCBMs¶ An additional opportunity to cooperate with the international community to enhance the long-term sustainability of our space activities is through the Group of Government Experts (or GGE) on Outer Space TCBMs, established by UN General Assembly Resolution 65/68. It is our hope that the Group of Governmental Experts will serve as a constructive mechanism to identify and examine the range of voluntary and pragmatic TCBMs in space that have the potential to mitigate the dangers and risks in an increasing contested and congested space environment. For example, TCBM proposals could include measures aimed at enhancing the transparency derived from exchanging national security space policies, strategies, activities and experiments or notifications regarding environmental or unintentional hazards to spaceflight safety. International consultations to prevent incidents in outer space and to prevent or minimize the risks of potentially harmful interference could also be a helpful TCBM to consider.¶ Over the past five years, there have been various U.N. General Assembly resolutions inviting all U.N. Member States to submit to the Secretary-General concrete proposals on international TCBMs. In July 2010, the U.N. Secretary-General compiled a report including all the contributions received from almost 25 different countries. It is our assumption that this report will be the starting point for the work of this GGE. While the United States may not be able to accept all TCBMs listed in this report, we can accept those that are voluntary, pragmatic, work to solve concrete problems, and enhance the stability and security of the space environment for all spacefaring nations. We look forward to working with our international colleagues in a GGE that serves as a constructive mechanism to examine voluntary and pragmatic TCBMs that enhance stability and safety, and promote responsible operations in space.¶ UN Committee on the Peaceful Uses of Outer Space¶ Finally, in addition to “top-down” cooperative initiatives, the United States believes there is also great value in efforts to adopt space TCBMs through “bottom-up” initiatives developed by government and private sector satellite operators. Therefore, the United States is taking an active role in the Working Group of the Scientific and Technical Subcommittee of UNCOPUOS on long-term sustainability.¶ This Working Group on the Long-Term Sustainability of Space Activities will be a key forum for the international development of “best practices guidelines” for space activities. We believe that many of the best practice guidelines addressed by this working group are integral to our efforts to pursue TCBMs that enhance stability and security in space. In fact, the United States is serving as the co-Chair of the Expert Group on Space Debris, Space Operations, and Space Situational Awareness, demonstrating our commitment to making progress to enhance spaceflight safety and to preserving the use of space for the long-term.¶ The United States is playing an active role in all of the expert groups, including the expert group led by Japan on space weather. Space weather is of particular concern to the long term sustainability of our space activities. Besides the direct hazard it poses to earth-orbiting satellites, space weather events greatly complicates SSA and collision prevention. We are pleased at the progress of these expert groups and believe the guidelines they develop will help to reduce risks to all space systems.

#### Obama is advancing an international framework against weaponization now

Krepon 12 (Michael, Co-Founder of the Stimson Center and Director of the Space Security program, " Space Code of Conduct Advances," 1/17, http://krepon.armscontrolwonk.com/archive/3329/space-code-of-conduct-advances)

Secretary of State Hillary Clinton’s announcement that the Obama administration will lend its support to international efforts to craft a Code of Conduct for responsible space-faring nations is welcome news. The fourth year of a presidential term is not the best time to announce an important diplomatic initiative, but the administration has had its hands full with nuclear negotiations and deadline-driven events, not to mention other crucibles at home and abroad. As written in this space (Second Wind, 9/21/11), the Code of Conduct initiative has always had to wait patiently in line. Chicago Cubs fans can relate to this phenomenon. In the meantime, the Code received a thorough Pentagon scrubbing and methodical interagency reviews to confirm the wisdom of this diplomatic initiative. President Obama and his team deserve kudos for fulfilling this campaign promise. ¶ The timing isn’t bad, despite this being an election year. This summer, a group of governmental experts dealing with space issues will convene in New York. This forum, consisting of representatives from fifteen nations, has a workable mandate, unlike the Conference on Disarmament in Geneva. One topic of conversation will no doubt be an ambitious and unverifiable treaty to ban weapons and threats from space championed by Russia and China. Another will be transparency and [CBMs] confidence-building measures in space, a subject that both Moscow and Washington can agree on, but probably not in every particular. A third topic of discussion will be the European Union’s draft Code of Conduct, which has been endorsed by Japan and Canada. The GGE could become another forum for wrangling and a wasted opportunity. It could also become the springboard to engage countries not involved in the EU’s effort to help shape a consensus diplomatic initiative on space. ¶ International endorsement of a Code of Conduct for responsible space-faring nations is not small change. There is a clear need to strengthen norms for space debris mitigation, traffic management and responsible stewardship of this endangered global commons. The Code of Conduct initiative could also help ameliorate US-Russian relations and provide China a way to step up to its responsibilities in space. To become a stakeholder, Beijing will have to drop its aversion to engage on realistic proposals. Like Moscow at the beginning of the SALT negotiations, Beijing will find deliberations over a Code of Conduct to be a challenge with respect to civil-military coordination and the acceptance of greater transparency.