## 1NC

### 1NC – T

#### A. Financial incentives are distinct from rules and regulations-this excludes procurement

Menz, 5 **-** Faculty of Economics and Finance, School of Business, Clarkson University, Bertrand H. Snell Hall, Potsdam, NY, also from the Center for International Climate and Environmental Research, Oslo (CICERO), Norway (Fredric, “Green electricity policies in the United States: case study,” Energy Policy, December, Science Direct) **Italics in original**

There is considerable variation among states in both their regulatory environments and the policies that have been implemented to promote green electricity. In the following discussion, state and local policy instruments are categorized as financial incentives, rules and regulations, and voluntary measures.[7](http://www.sciencedirect.com.proxy.lib.umich.edu/science/article/pii/S0301421504001648#fn7)Financial incentives include various subsidies and/or funding in direct support of green electricity projects, tax incentives (credits, deductions, or exemptions), and provisions for zero-interest or low-interest loans. Rules and regulations include requirements that utilities distribute a minimum share of electricity from renewable or green energy sources, green power purchase requirements for government entities, and net-metering requirements for consumers with small renewable generating facilities. Voluntary measures include green power products aimed at electricity consumers, green power certificate programs, and other programs to increase market support for renewable energy technologies.

#### B. Negative Interpretation is Superior

**1-Limits-Our interpretation allows a fair number of mechanisms like grants, tax incentives, and loans. Their interpretation explodes the topic by including a number of rules and regulations like feed-in tariffs, net metering requirements, green power certification, and procurement. Fair limits are important to encourage clash and manageable research burdens.**

**2-Ground-Procurement is a distinct mechanism independent of affirmatives that are required directly to stimulate commercialization in the market. Procurement also allows the affirmative to dodge core generics like the energy DA by increasing procurement in contained areas like nuclear submarines.**

#### C. Topicality is a voting issue-Fairness to the Negative

### 1NC – Renewables DA

Renewables are replacing nuclear now

Brown-Earth Policy Institute-11/12

The Great Transition, Part I: From Fossil Fuels to Renewable Energy

<http://grist.org/article/the-great-transition-part-i-from-fossil-fuels-to-renewable-energy/>

The great energy transition from fossil fuels to renewable sources of energy is under way. As fossil fuel prices rise, as oil insecurity deepens, and as concerns about pollution and climate instability cast a shadow over the future of coal, a new world energy economy is emerging. The old energy economy, fueled by oil, coal, and natural gas, is being replaced with an economy powered by wind, solar, and geothermal energy. The Earth’s renewable energy resources are vast and available to be tapped through visionary initiatives. Our civilization needs to embrace renewable energy on a scale and at a pace we’ve never seen before. We inherited our current fossil fuel based world energy economy from another era. The 19th century was the century of coal, and oil took the lead during the 20th century. Today, global emissions of carbon dioxide (CO2)—the principal climate-altering greenhouse gas—come largely from burning coal, oil, and natural gas. Coal, mainly used for electricity generation, accounts for 44 percent of global fossil-fuel CO2 emissions. Oil, used primarily for transportation, accounts for 36 percent. Natural gas, used for electricity and heating, accounts for the remaining 20 percent. It is time to design a carbon- and pollution-free energy economy for the 21st century. Some trends are already moving in the right direction. The burning of coal, for example, is declining in many countries. In the United States, the number two coal consumer after China, coal use dropped 14 percent from 2007 to 2011 as dozens of coal plants were closed. This trend is expected to continue, due in part to widespread opposition to coal now being organized by the Sierra Club’s Beyond Coal campaign. Oil is used to produce just 5 percent of the world’s electricity generation and is becoming ever more costly. Because oil is used mainly for transport, we can phase it out by electrifying the transport system. Plug-in hybrid and all-electric cars can run largely on clean electricity. Wind-generated electricity to operate cars could cost the equivalent of 80-cent-per gallon gasoline. As oil reserves are being depleted, the world has been turning its attention to plant-based energy sources. Their potential use is limited, though, because plants typically convert less than 1 percent of solar energy into biomass. Crops can be used to produce automotive fuels, such as ethanol and biodiesel. Investments in U.S. corn-based ethanol distilleries became hugely profitable when oil prices jumped above $60 a barrel following Hurricane Katrina in 2005. The investment frenzy that followed was also fueled by government mandates and subsidies. In 2011, the world produced 23 billion gallons of fuel ethanol and nearly 6 billion gallons of biodiesel. But the more research that’s done on liquid biofuels, the less attractive they become. Every acre planted in corn for ethanol means pressure for another acre to be cleared elsewhere for crop production. Clearing land in the tropics for biofuel crops can increase greenhouse gas emissions instead of reducing them. Energy crops cannot compete with land-efficient wind power. The scientific community is challenging the natural gas industry’s claim that its product is fairly climate-benign. Natural gas produced by hydraulic fracturing, or fracking (a much-touted key to expanding production) is even more climate-disruptive than coal because of methane gas leakage. (Methane is a potent contributor to climate change.) The last half of the twentieth century brought us nuclear power, once widely touted as the electricity source of the future. Although nuclear reactors supply 13 percent of the world’s electricity, nuclear power’s limited role in our future has been clear for some time. It is simply too expensive. Countries around the world are richly endowed with renewable energy, in some cases enough to easily double their current electrical generating capacities. A revamped clean energy economy will harness more energy from the wind and sun, and from within the Earth itself. Climate-disrupting fossil fuels will fade into the past as countries turn to clean, climate-stabilizing, nondepletable sources of energy. The growth in the use of solar cells that convert sunlight into electricity can only be described as explosive, expanding by 74 percent in 2011. Early photovoltaic (PV) installations were all small-scale—mostly on residential rooftops. That’s changing as more utility-scale PV projects are being launched. The United States, for example, has under construction and development more than 100 utility scale projects. Solar-generated electricity is particularly attractive in desert regions such as the U.S. Southwest because peak generation meshes nicely with peak air conditioning use. The world’s current 70,000 megawatts of photovoltaic installations can, when operating at peak power, match the output of 70 nuclear power plants. With PV installations climbing and with costs continuing to fall, cumulative PV generating capacity could surpass 1 million megawatts in 2020. (Current world electricity generating capacity from all sources is 5 million megawatts.) Installing solar panels for individual homes in the villages of developing countries is now often cheaper than it is to supply them with electricity by building a central power plant and a grid. The heat that comes from within the Earth—geothermal energy—can be used for heating or converted into steam to generate electricity. Many countries have enough harnessable geothermal energy to satisfy all of their electricity needs. Despite this abundance, the geothermal energy capacity installed as of 2012 is only enough to provide electricity for some 10 million homes worldwide. Roughly half of the world’s 11,000 megawatts of installed geothermal generating capacity is concentrated in the United States and the Philippines. Altogether, 24 countries now convert geothermal energy into electricity. The United States, with 130 confirmed geothermal plants under construction or in development, will be bringing at least 1,000 megawatts of generating capacity online in the near term. Worldwide, this accelerating pace could yield 200,000 megawatts of generating capacity by 2020. Each alternative energy source—whether solar, geothermal, or wind—has a major role to play, but it is wind that is on its way to becoming the foundation of the new energy economy.

There is a political and financial tradeoff.

Burke et al 2012

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The costs of nuclear new build are extremely high. UK governments, both Labour and the Coalition Government, have made it clear that money for new nuclear must come from the private sector, and yet, despite promising not to, have then gone on to attract private sector investment, thus committing large amounts of public money not available for other energy supply or demand management options. The scale of both the financial and the political investment required are such that they will crowd out equivalent investment in renewables and energy efficiency. The cost of the new nuclear build that Coalition Governments hopes for is in the region of £50 billion. Since private investors money is to be channelled through energy utilities (either as equity borrowing or simple bank lending), it will come from the same funding pools that other types of energy generation investment would access; part of the opportunity cost of nuclear power is that it will inevitably draw investment away from alternatives. But it’s not just the scale of the investment needed that undermines other possibilities. The massive timescales for bringing nuclear power online are also important - once investment has begun in nuclear, the entirety of the investment must remain in nuclear or be lost. Renewables are much nimbler – if problems occur, the project can be scaled down and still provide some generated energy. Lastly, there is a substantial political opportunity cost. When governments throw their weight behind a particular course of action, they divert resources from all others. In the past decade, UK governments of both parties have established over three dozen taxpayer-funded quangos and agencies to support the nuclear industry. It is inevitable that the pronuclear perspective of these bodies will pervade the thinking of the Civil Service, and of politicians and business investors too. Speaking about Finland’s experience with the disastrous Olkiluoto reactor, Oras Tynkynnen, a former climate policy advisor to the Office of the Finnish Prime Minister, said: “We concentrated so much on nuclear that we lost sight of everything else ... And nuclear has failed to deliver. It has turned out to be a costly gamble for Finland, and for the planet”. 2

#### Renewables key to solve warming

Rigg, citing the IPCC, 11 (Kelly Rigg is the Executive Director of the GCCA, a global alliance of 300 organizations cooperating under the banner of the tcktcktck campaign “IPCC Report: Renewable Energy Key to Solving Climate Change” http://www.huffingtonpost.com/kelly-rigg/ipcc-report-renewable-ene\_b\_859426.html)

A new IPCC report is hot off the press this time focused on the potential of renewable energy sources to solve the climate crisis. Given the UN climate science panel's proclivity for producing scenarios guaranteed to make any thinking person lose sleep at night, the good news take-home message was a welcome cause for celebration. From a technological standpoint, renewables can more than meet our global energy demands. By 2050, nearly 80 percent of our energy needs can be met by renewables with existing technologies. So it's clear that whatever challenges and difficulties lay ahead, they are entirely within our power to overcome, simply by adopting the right policy incentives. A myriad of facts about the amazing rise of renewable energy can be found in the press releases of Greenpeace, WWF and the IPCC itself.

#### That means extinction---outweighs nuclear war

Deibel 7 [Terry L., Professor of IR @ National War College, “Foreign Affairs Strategy: Logic for American Statecraft”, Conclusion: American Foreign Affairs Strategy Today]

Finally, there is one major existential threat to American security (as well as prosperity) of a nonviolent nature, which, though far in the future, demands urgent action. It is the threat of global warming to the stability of the climate upon which all earthly life depends. Scientists worldwide have been observing the gathering of this threat for three decades now, and what was once a mere possibility has passed through probability to near certainty. Indeed not one of more than 900 articles on climate change published in refereed scientific journals from 1993 to 2003 doubted that anthropogenic warming is occurring. “In legitimate scientific circles,” writes Elizabeth Kolbert, “it is virtually impossible to find evidence of disagreement over the fundamentals of global warming.” Evidence from a vast international scientific monitoring effort accumulates almost weekly, as this sample of newspaper reports shows: an international panel predicts “brutal droughts, floods and violent storms across the planet over the next century”; climate change could “literally alter ocean currents, wipe away huge portions of Alpine Snowcaps and aid the spread of cholera and malaria”; “glaciers in the Antarctic and in Greenland are melting much faster than expected, and…worldwide, plants are blooming several days earlier than a decade ago”; “rising sea temperatures have been accompanied by a significant global increase in the most destructive hurricanes”; “NASA scientists have concluded from direct temperature measurements that 2005 was the hottest year on record, with 1998 a close second”; “Earth’s warming climate is estimated to contribute to more than 150,000 deaths and 5 million illnesses each year” as disease spreads; “widespread bleaching from Texas to Trinidad…killed broad swaths of corals” due to a 2-degree rise in sea temperatures. “The world is slowly disintegrating,” concluded Inuit hunter Noah Metuq, who lives 30 miles from the Arctic Circle. “They call it climate change…but we just call it breaking up.” From the founding of the first cities some 6,000 years ago until the beginning of the industrial revolution, carbon dioxide levels in the atmosphere remained relatively constant at about 280 parts per million (ppm). At present they are accelerating toward 400 ppm, and by 2050 they will reach 500 ppm, about double pre-industrial levels. Unfortunately, atmospheric CO2 lasts about a century, so there is no way immediately to reduce levels, only to slow their increase, we are thus in for significant global warming; the only debate is how much and how serious the effects will be. As the newspaper stories quoted above show, we are already experiencing the effects of 1-2 degree warming in more violent storms, spread of disease, mass die offs of plants and animals, species extinction, and threatened inundation of low-lying countries like the Pacific nation of Kiribati and the Netherlands at a warming of 5 degrees or less the Greenland and West Antarctic ice sheets could disintegrate, leading to a sea level of rise of 20 feet that would cover North Carolina’s outer banks, swamp the southern third of Florida, and inundate Manhattan up to the middle of Greenwich Village. Another catastrophic effect would be the collapse of the Atlantic thermohaline circulation that keeps the winter weather in Europe far warmer than its latitude would otherwise allow. Economist William Cline once estimated the damage to the United States alone from moderate levels of warming at 1-6 percent of GDP annually; severe warming could cost 13-26 percent of GDP. But the most frightening scenario is runaway greenhouse warming, based on positive feedback from the buildup of water vapor in the atmosphere that is both caused by and causes hotter surface temperatures. Past ice age transitions, associated with only 5-10 degree changes in average global temperatures, took place in just decades, even though no one was then pouring ever-increasing amounts of carbon into the atmosphere. Faced with this specter, the best one can conclude is that “humankind’s continuing enhancement of the natural greenhouse effect is akin to playing Russian roulette with the earth’s climate and humanity’s life support system. At worst, says physics professor Marty Hoffert of New York University, “we’re just going to burn everything up; we’re going to heat the atmosphere to the temperature it was in the Cretaceous when there were crocodiles at the poles, and then everything will collapse.” During the Cold War, astronomer Carl Sagan popularized a theory of nuclear winter to describe how a thermonuclear war between the Untied States and the Soviet Union would not only destroy both countries but possibly end life on this planet. Global warming is the post-Cold War era’s equivalent of nuclear winter at least as serious and considerably better supported scientifically. Over the long run it puts dangers form terrorism and traditional military challenges to shame. It is a threat not only to the security and prosperity to the United States, but potentially to the continued existence of life on this planet.

### 1NC – CP

#### The United States Federal Government should obtain, through alternative financing, advanced microgrids for military bases in the United States, maximized to account for site specific energy factors. This should include increased support for renewable energy sources.

Microgrid solves---protects critical missions

DEFENSE COMMUNITIES 360-8/5/12

Microgrids Offer Improved Energy Security, Study Concludes

http://www.defensecommunities.org/microgrids-offer-improved-energy-security-study-concludes/#

Advanced microgrids offer a cost-effective solution to military installations’ growing vulnerability to the fragile electric grid, according to a study released last month by DOD’s office of installations and environment. The study, performed by MIT Lincoln Laboratory, illustrates the largely untapped potential of moving to smarter, next generation microgrids that can accommodate much greater use of renewable energy sources and tighter integration with the electrical grid. A microgrid that can operate when tied to the grid would offer new opportunities for the military to generate cost savings by using backup generation assets during normal operation and generate financial revenue by using advanced ancillary services. The study found that the combination of on-site energy generation and storage, together with a 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. There is no “one size fits all” solution, the report concludes. The location of an installation influences the options available for energy sources and 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.

### 1NC – DOD DA

The world is slowing norming towards cooperation in space which solve space militarization—but it’s a fragile process

Krepon 1/17/12 (Michael Krepon is co-founder of Stimson, and director of the South Asia and Space Security programs. “Space Code of Conduct Advances” <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 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.

DOD SMR development allows the Air Force to deploy a space laser

Maybury, 12 (Chief Scientist-USAF, “Energy Horizons: United States Air Force Energy S&T Vision 2011-2026,” 1/31, http://www.fas.org/irp/doddir/usaf/energy.pdf)

Space is the ―ultimate high ground, providing access to every part of the globe, including denied areas. Space also has the unique characteristic that once space assets reach space, they require comparatively small amounts of energy to perform their mission, much of which is renewable. This simple characterization belies the complexity of the broader space enterprise. The bigger space energy picture must encompass the energy required to maintain and operate the launch ranges, the energy consumed during the launch of space assets, the energy generated and used in space, the energy consumed in satellite control stations, and the energy consumed in data ingest and processing centers. A comprehensive space energy strategy that addresses this full spectrum promises to enhance the resiliency, sustainability, and affordability of future space systems and operations through reduced consumption, increased energy supply, and cultural change. In the near-term, there should be an emphasis on lowering ground facilities and systems energy consumption, while continuing S&T investments for long-term assured energy advantage. The focus on ground facilities should include launch ranges, world-wide satellite control facilities, as well as the substantial data centers required to process and disseminate data to warfighters. In the longer term it may be possible to broaden the set of missions to be performed from space in an energy-efficient manner. This would require significant advances in S&T related to space-borne energy generation and storage technologies. In the mid- and long-term, substantial energy savings may be achieved through commonality in ground systems, efficient operations of those ground systems, as well as expanding the use of renewable energy resources. 3.1 Space Domain Strategic Context On-orbit assets continue to be among the highest demand and lowest density assets in the Air Force inventory. They consistently and effectively provide unique capability to the community. These assets are constrained, not just by the size of the payloads they carry, but also by their capability. Their austere operational environment coupled with current technology constraints means these systems regularly are required to operate long past their projected life. S&T that increases energy production, storage, and utilization of on-orbit assets can both provide longer life systems or increase capability value for the Air Force. In contrast to the air domain, assets in the space portfolio do not use traditional aviation fuels for mobility (airlift and air refueling). Indeed, once space assets are placed in orbit, with the very small exception of on-board consumables (to include propulsion for satellite maneuverability), only energy for the associated ground facilities and systems is required to maintain and operate them. Although there is an energy cost in getting systems to space, it is relatively small compared to the energy costs of the ground infrastructure. Therefore, in the near-term, investments in S&T that reduce the energy costs of space systems should focus primarily on reducing the energy costs of the associated ground facilities and systems. Nonetheless, there are promising S&T projects, such as the Reusable Booster System (RBS) and revolutionary small launch vehicles, that may substantially reduce the cost to orbit by applying lessons learned from the commercial aircraft industry to the RBS. For example, reuse may dramatically reduce manufacturing costs while simultaneously permitting much faster turnaround times. However, the full implications of reusable launch vehicles on energy consumption are not yet fully understood. The reusable components of RBS must be rocketed or jetted back to the launch base, resulting in greater use of energy for every launch. The energy impact of RBS requires detailed study. Additional potentially large energy cost savings could be achieved by employing other technologies emphasized in Technology Horizons, including fractionated, composable, and networked space systems. Much smaller systems that may perform the same functions as larger systems offer the possibility of substantially lowering launch costs and reducing on-orbit energy use. On the other hand, launching larger constellations of smaller satellites in low earth orbit may require more energy and use less efficient small launch vehicles. The total energy picture associated with the use of small, fractionated satellites requires careful analysis. Technology Horizons also advocated autonomous real-time, cross-domain, assured and trusted Space Situational Awareness (SSA). While autonomy can be used to save energy and cost for virtually any space mission, automating heavily human-directed SSA can potentially save large energy costs by reducing the presence of human interaction and, at the same time, increasing responsiveness. Figure 3.1 visually emphasizes that the overwhelming share of energy use for space domain operations is in terrestrial facilities and systems. Of the energy consumed for Air Force Space Command (AFSPC) missions, 97.2% is used by terrestrial facilities, 1.8% is used for ground vehicle transportation, and an estimated 1% is used for rocket launches. The commercial space sector has taken significantly different approaches on the ground infrastructure. Commercial space systems are operated with smaller facilities, small crews, and even autonomously. AFSPC has considered base closures to save significant costs; another solution, either in concert with base closures or by itself, is to establish an aggressive program to replace local power generation with renewable technologies. This would directly support the Air Force Energy Plan goals in the near-term, while also supporting assured sources of supply and cost reduction goals. Efforts are already underway to create more energy efficient ground assets using information from the cyber and infrastructure elements of Energy Horizons. A key opportunity is energy cost reduction for terrestrial radar and heating, ventilation, and air conditioning (HVAC) systems, but so far little work has been done on this. 3.2 Space Energy Technologies Leading edge technologies for energy performance of on-orbit space systems can transition to terrestrial facilities and systems to lower their energy intensity and consumption. These technologies fall into three categories which are addressed in turn: energy generation, storage, and transmission. 3.2.1 Energy Generation Table 3.1 illustrates the near-, mid- and far-term opportunities in energy generation. Today, there is an emphasis on continuing to evolve Inverted Meta-Morphic (IMM) solar cell arrays that are exceeding 34% efficiency in demonstration programs. In contrast, current terrestrial solar cell arrays for energy generation are far less efficient, below 20%. If packaging and production issues could be overcome, the improved efficiency offered by IMM would dramatically improve the output capabilities of ground facility solar array systems and, in turn, lower the use of non-renewable energy sources. There may also be spinoff to the air and ground domains through programs such as DARPA‘s Vulture program, a long-endurance unmanned vehicle powered by solar cells, which is taking advantage of the same kinds of efficiency improvements in terrestrial systems. The importance of these S&T efforts lies in the fact that every 1% increase in solar cell energy generation efficiency translates to a 3.5% increase in power (or decrease in mass) for the system. The downside is that as the efficiency improves, the relative benefit is not as great, so there is a point of diminishing returns with the evolutionary approach. In addition, amorphous-Silicon (a-Si) for flexible arrays has achieved 10% efficiency. While a-Si has not been fully space qualified, it could be transitioned to terrestrial systems such as Remotely Piloted Aircraft (RPA) and powered tents. There are other breakthrough space energy generation component technologies with the potential of achieving up to 70% efficiency. Examples include quantum dots and dilute nitrides in solar cells. But there are also entirely new technologies such as tethers to attempt to harvest energy from the geomagnetic field, and energy harvesting from system heat waste. These ideas, as well as **new developments in** nuclear energy, including **small modular reactors, can potentially fuel local facilities.** Recently, there has been progress in developing large systems for energy generation, including very large deployable panels as developed by the Air Force Research Lab (AFRL), DARPA, and industry. For example, we are currently limited to 27 kW arrays for satellite power, whereas more power is required for some future space missions by the AF, National Security Space (NSS), and NASA. **Employing larger and more efficient arrays will enable missions that require very high power, such as** space-based radar or **space-based laser missions**. An example of a system that is almost ready for a flight demonstration is the AFRL-Boeing 30 kW Integrated Blanket Interconnect System (IBIS). Figure 3.2 shows the technology and implementation concept for such a High Power Solar Array (HPSA). In the long term, increased solar cell efficiencies and revolutionary materials foreshadow the potential of 500 kW on-orbit power generation technologies, which would be transformational for performing missions from space-based systems. In addition to improving photovoltaic efficiencies, other potential energy production is possible in the mid- to far-term. In addition to modern designs for autosafing, small modular nuclear reactors for ground operations energy, nuclear energy has been demonstrated on several satellite systems (e.g., Radioisotope Thermoelectric Generators (RTG)). **This source provides consistent power regardless of harvestable resources** (i.e. solar) at a much higher energy and power density than current technologies. While the implementation of such a technology should be weighed heavily against potential catastrophic outcomes, **many investments into small modular reactors can be leveraged for space based systems. As these nuclear power plants decrease in size, their utility on board space based assets increases.**

#### Causes Russian miscalc and nuclear war

**Graham 5** (Thomas, is a former special representative of the president for arms control, nonproliferation, and disarmament. In this and other senior capacities, he participated in every major arms control and nonproliferation negotiation in which the United States took part from 1970 to 1997. “Space Weapons and the Risk of Accidental Nuclear War” <http://www.gsinstitute.org/docs/Graham_Space_ACT_12-05.pdf> //Donnie

Both the United States and Russia rely on space-based systems to provide early warning of a nuclear attack. If deployed, however, U.S. **space-based** missile defense interceptors could eliminate the Russian early warning satellites quickly **and without warning**. So, just the existence of U.S. space weapons could make Russia’s strategic **trigger fingers itchy**. The potential protection space-based defenses might offer the United States is swamped therefore by their potential cost: a failure of or false signal from a component of the Russian early warning system could lead to a disastrous reaction and **accidental nuclear war**. There is no conceivable missile defense, space-based or not, that would offer protection in the event that the Russian nuclear arsenal was launched at the United States. Nor are the Russians or other countries likely to stand still and watch the United States construct space-based defenses. These states are likely to respond by developing advanced anti-satellite weapon systems. 1 These weapons, in turn, would endanger U.S. early warning systems, impair valuable U.S. weapons intelligence efforts, and increase the jitteriness of U.S. officials. The Dangers of Failed Early Warning Systems The Russian early warning system is in serious disrepair. This system consists of older radar systems nearing the end of their operational life and just three functioning satellites, although the Russian military has plans to deploy more. The United States has 15 such satellites. Ten years ago, on January 25, 1995, this aging early warning network picked up a rocket launch from Norway. The Russian military could not determine the nature of the missile or its destination. Fearing that it might be a submarine launched missile aimed at Moscow with the purpose of decapitating the Russian command and control structure, the Russian military alerted President Boris Yeltsin, his defense minister, and the chief of the general staff. They immediately opened an emergency teleconference to determine whether they needed to order Russia’s strategic forces to launch a counterattack.

**Extinction :(**

Bostrom 2 (Nick, PhD Faculty of Philosophy, Oxford University “Existential Risks :Analyzing Human Extinction Scenarios and Related Hazards” http://www.nickbostrom.com/existential/risks.html)

A much greater existential risk emerged with the build-up of nuclear arsenals in the US and the USSR. An all-out nuclear war was a possibility with both a substantial probability and with consequences that might have been persistent enough to qualify as global and terminal. There was a real worry among those best acquainted with the information available at the time that a nuclear Armageddon would occur and that it might annihilate our species or permanently destroy human civilization.[[4]](#_ftn4) Russia and the US retain large nuclear arsenals that could be used in a future confrontation, either accidentally or deliberately. There is also a risk that other states may one day build up large nuclear arsenals. Note however that a smaller nuclear exchange, between India and Pakistan for instance, is not an existential risk, since it would not destroy or thwart humankind’s potential permanently. Such a war might however be a local terminal risk for the cities most likely to be targeted. Unfortunately, we shall see that nuclear Armageddon and comet or asteroid strikes are mere preludes to the existential risks that we will encounter in the 21st century.

### 1NC – Politics

#### Obama pushing immigration reform first even with fiscal issues and it will pass – GOP electoral incentives

Stien and Foley 1/2/13 (\*Sam, Political Reporter at the Huffington Post, based in Washington, D.C. Previously he has worked for Newsweek magazine, the New York Daily News and the investigative journalism group Center for Public Integrity. He has a masters from the Columbia University Graduate School of Journalism and is a graduate of Dartmouth College, \*Elise, reporter for the Huffington Post in Washington,

D.C. She previously worked at The Washington Independent., “Obama's Immigration Reform Push To Begin This Month” <http://www.huffingtonpost.com/2013/01/02/obama-immigration-reform_n_2398507.html>)

WASHINGTON -- Despite a bruising fiscal cliff battle that managed to set the stage for an even more heated showdown that will likely take place in a matter of months, President Barack Obama is planning to move full steam ahead with the rest of his domestic policy agenda. An Obama administration official said the president plans to push for immigration reform this January. The official, who spoke about legislative plans only on condition of anonymity, said that coming standoffs over deficit reduction are unlikely to drain momentum from other priorities. The White House plans to push forward quickly, not just on immigration reform but gun control laws as well. The timeframe is likely to be cheered by Democrats and immigration reform advocates alike, who have privately expressed fears that Obama's second term will be drowned out in seemingly unending showdowns between parties. The just-completed fiscal cliff deal is giving way to a two-month deadline to resolve delayed sequestration cuts, an expiring continuing resolution to fund the government and a debt ceiling that will soon be hit. With those bitter battles ahead, the possibility of passing other complicated legislation would seem diminished. "The negative effect of this fiscal cliff fiasco is that every time we become engaged in one of these fights, there's no oxygen for anything else," said a Senate Democratic aide, who asked for anonymity to speak candidly. "It's not like you can be multi-tasking -- with something like this, Congress just comes to a complete standstill." It remains unclear what type of immigration policies the White House plans to push in January, but turning them into law could be a long process. Aides expect it will take about two months to write a bipartisan bill, then another few months before it goes up for a vote, possibly in June. A bipartisan group of senators are already working on a deal, although they are still in the early stages. Rep. Zoe Lofgren (D-Calif.) will likely lead on the Democratic side in the House. While many Republicans have expressed interest in piecemeal reform, it's still unclear which of them plan to join the push. Lofgren expressed hope that immigration reform would be able to get past partisan gridlock, arguing that the election was seen as something of a mandate for fixing the immigration system and Republicans won't be able to forget their post-election promises to work on a bill. "In the end, immigration reform is going to depend very much on whether Speaker [John] Boehner wants to do it or not," Lofgren said. Advocates have vowed to keep pushing for reform. As part of their efforts, they plan to remind Republican members of Congress about their presidential nominee's defeat among Latino and Asian voters, a majority of whom support a fix to the immigration system. "They can procrastinate as long as they want, but they're going to have a serious day of reckoning next election cycle," said Angela Kelley, vice president for immigration policy and advocacy at the Center for American Progress. "We're going to have a lot of near-death experiences with this issue, but I'm pretty confident it's never going to go completely to a flatline." Good news for immigration advocates may have come Tuesday night, when Boehner broke the so-called "Hastert Rule" and allowed the fiscal cliff bill to come for a vote without support from a majority of his Republican conference. Given opposition to immigration reform by many Tea Party Republicans, the proof that Boehner is willing to bypass them on major legislation is a good sign, the Democratic aide said. "If something is of such importance that the GOP establishment [is] telling Boehner, 'You must do this. You need to get this off the table soon,'" the Democratic aide said, the speaker could break the Hastert Rule again. "He already did it with this fiscal issue, so I would not be surprised if when it came down to it he puts up a bill that he just allows to go through with a combination of Democratic and Republican votes, without worrying about a majority of the majority," the aide continued. Frank Sharry, executive director of the pro-immigration reform group America's Voice, also said he thinks the House could pass an immigration bill in the same way it did last night, relying on support from both parties. He's hopeful that the fiscal cliff fight could even make them happy to work out legislation in a more standard way. "I never thought I'd say this, but after bruising battles over the future of the American and world economy, the chance to legislate through regular order on immigration reform might have leaders in both parties working together and singing 'Kumbaya,'" Sharry said.

Energy push requires massive political capital---Obama doesn’t have time and energy to get energy and immigration reform

Davenport-energy correspondent for National Journal-12/6/12

How Obama and Congress Could Find Common Ground on Energy

<http://www.nationaljournal.com/magazine/how-obama-and-congress-could-find-common-ground-on-energy-20121206>

AGAINST THE CLOCK One big obstacle is time. A second-term president has about two years to push through major legislation before the next presidential campaign begins. In addition, two huge issues are already on the docket: immigration and tax reform. A sweeping overhaul of the nation’s tax code, which could easily absorb Congress through 2014, offers the first opportunity for major energy reform. Some lawmakers will probably insert a carbon-tax swap proposal in a broader tax-reform package, although for now the carbon tax seems unlikely to succeed. Democrats will also try to end tax breaks for the oil industry while extending those for renewable energy. But if the tax-reform debate ends without comprehensive new energy provisions, it may be too late to enact an energy overhaul. “If President Obama has victories on immigration and the deficit, that’s two potentially momentous victories for the president in a second term, where victories are not typical,” says historian Alfred Zacher, author of Trial and Triumph: Presidential Power in the Second Term. “It’s difficult to believe he’d win three.” Still, Zacher says, “because of his desire for a legacy, and the fact that he won’t need to worry about his base or reelection, he could come up with some unexpected environmental solutions. He’ll have to be a very capable politician, but if he can pull it off, he’ll be revered.” Ultimately, as Dorgan puts it, “there needs to be a will to do it, and it needs to come from the president and the leaders of Congress. If there’s not a will on the part of the president and the leaders of the House and Senate, it won’t happen. He needs to make it a priority.” If President Obama wants a legacy on energy, he’ll have to bring to the issue the same passion that candidate Obama once did.

#### Obama’s political capital is key to reform passage

Dade 12/7/12 (Corey, staffwriter for NPR, “Black, Latino Groups: It's Our Turn, Mr. President” <http://www.npr.org/2012/12/05/166573082/black-latino-groups-its-our-turn-mr-president>)

Spending 'Political Capital' For Latinos, the November election has sparked momentum for their top issue, immigration. Congressional Republicans have since embraced immigration reform as a priority. Bipartisan talks are under way in the House on legislation that could be introduced early next year. Obama has said Congress should "seize the moment," yet Latino leaders insist that voters have given the president a mandate to lead the effort. Some Latino leaders believe Obama should have fought more aggressively to push the DREAM Act through Congress in 2010. (The bill would have established a path to citizenship for young people brought to the United States as children who attend college or serve in the military.) Latinos also criticized the Obama administration, before it changed its policy, for deporting a record 1.1 million people in three years. "Not only the president but others have said in the past, 'How much political capital do we need to spend on this issue?' Everybody understands now that you need to spend all of it," says Rep. Luis Gutierrez, D-Ill. "With the same vigor and energy that Latino people voted for this president, he should do this."

#### Comprehensive immigration reform is key to the economy and highly skilled workers

Farrell 12/13/12 (Chris, a contributing editor for Bloomberg Businessweek. From 1986-97, he was on the magazine's staff, as a corporate finance staff and department editor and then as an economics editor. Farrell wrote Right on the Money: Taking Control of Your Personal Finances and Deflation: What Happens When Prices Fall? Among Farrell's many awards are a National Magazine Award, two Loeb Awards, and the Edward R. Murrow Award. Farrell is a graduate of the London School of Economics and Stanford University. “Obama’s Next Act: Immigration Reform” <http://www.businessweek.com/articles/2012-12-13/obamas-next-act-immigration-reform>)

Washington won’t get much of a reprieve from verbal pyrotechnics once the drama of the fiscal cliff is over. Up next: major immigration reform. President Obama has made it clear that a comprehensive overhaul of the nation’s badly frayed immigration system is a second-term priority. Many Republican lawmakers are convinced the big takeaway from the 2012 election results is that conservatives need to rethink their hard-line stance on immigration—including illegal immigrants. Here’s what Washington should do before tackling the tough job of rewriting the immigration laws: Create a quicksilver path to citizenship for the 11 million to 12 million undocumented workers in the U.S. (excluding the small number convicted of violent crimes or multiple felonies). The shift in status acknowledges that these foreign-born newcomers, like previous generations of immigrants, overcame significant obstacles to come to the U.S. to make a better life for their families. Illegal immigrants are neighbors heading off to work, sending their kids to school, and attending church. Their everyday lives would vastly improve by moving from the shadows of society into the mainstream. More important from a public-policy perspective, the change would give a boost to the economy’s underlying dynamism. “What you’re doing in the short run is making it easier for workers to move between jobs, a relatively small effect,” says Gordon Hanson, a professor of economics at the University of California at San Diego. “The larger effect from eliminating uncertainty for these immigrants is creating incentives for them to make long-term investments in careers, entrepreneurship, education, homes, and community.” Let’s state the obvious: A rapid transformation of illegal immigrants into legal immigrants isn’t in the cards. Amnesty—let alone citizenship—is an anathema to large parts of the electorate. Too bad, since the scholarly evidence is compelling that immigrants—documented or not, legal or illegal—are a boon to the net economy. “Competition fosters economic growth,” says Michael Clemens, senior fellow at the Center for Global Development in Washington. The economic return from attracting skilled immigrants to the U.S. is well known. Foreign-born newcomers account for some 13 percent of the population, yet they are responsible for one-third of U.S. patented innovations. The nation’s high-tech regions such as Silicon Valley, the Silicon Hills of Austin, Tex., and Boston’s Route 128 rely on immigrant scientists, engineers, entrepreneurs, and employees. Better yet, economist Enrico Moretti at the University of California at Berkeley calculates that a 1 percent increase in the share of college-educated immigrants in a city hikes productivity and wages for others in the city. Less appreciated is how much the economy gains from the efforts of less-skilled immigrants, including illegal workers. Throughout the country, foreign-born newcomers have revived beaten-down neighborhoods as immigrant entrepreneurs have opened small businesses and immigrant families have put down stakes. Immigrant workers have played a vital role keeping a number of industries competitive, such as agriculture and meatpacking. Cities with lots of immigrants have seen their per capita tax base go up, according to David Card, an economist at UC Berkeley. Despite the popular impression that a rising tide of immigrants is associated with higher crime rates, research by Robert Sampson of Harvard University and others offer a compelling case that it’s no coincidence that the growing ranks of immigrants tracks the reduction in crime in the U.S. But don’t newcomers—legal and illegal—drive down wages and job opportunities for American workers? Not really. A cottage industry of economic studies doesn’t find any negative effect on native-born wages and employment on the local level. On the national level the research shows the impact on native-born Americans doesn’t drift far from zero, either positively or negatively. “In both cases, immigrants are more likely to complement the job prospects of U.S.-born citizens than they are to compete for the same jobs as U.S.-born citizens,” Giovanni Peri, an economist at the University of California at Davis, writes in Rationalizing U.S. Immigration Policy: Reforms for Simplicity, Fairness, and Economic Growth. The counterintuitive results reflect a numbers of factors. Immigrants expand the size of the economic pie by creating new businesses, new jobs, and new consumers. Middle-class families find it easier to focus on careers with affordable immigrant labor offering gardening, child care, and other services. Many illegal immigrants aren’t fluent in English, so they don’t compete for the same jobs as native-born workers. Another factor behind the lack of direct competition is the higher educational level of native-born Americans. In 1960 about half of U.S.-born working-age adults hadn’t completed high school, while the comparable figure today is about 8 percent. The real downside concern is on the fiscal side of the immigrant ledger. Yes, more taxes would go into Social Security, Medicare, and the like with legalization, but more people would qualify for Medicaid, welfare, and other benefits. At the local level, many school districts are strained financially from educating immigrant children, legal and illegal. That said, the prospect of fiscal costs would diminish as newly legalized immigrant workers move freely around the country seeking jobs, entrepreneurs are comfortable expanding their payrolls, and immigrant parents push their children to live the American Dream. “Over time, as entrepreneurs emerge and families are better able to get their kids through high school and college, you’re reducing the long-run fiscal claim of the group,” says Hanson. There is no economic evidence that making roughly 6 percent of the workforce illegal will benefit the economy. Plenty of research supports the opposite case. A fast track to legality offers Washington a rare twofer: a just move that’s economically efficient.

#### Nuclear War

Kemp 2010 Geoffrey, Director of Regional Strategic Programs at The Nixon Center, served in the White House under Ronald Reagan, special assistant to the president for national security affairs and senior director for Near East and South Asian affairs on the National Security Council Staff, Former Director, Middle East Arms Control Project at the Carnegie Endowment for International Peace, 2010, The East Moves West: India, China, and Asia’s Growing Presence in the Middle East, pg. 233-4

The second scenario, called Mayhem and Chaos, is the opposite of the first scenario; everything that can go wrong does go wrong. The world economic situation weakens rather than strengthens, and India, China, and Japan suffer a major reduction in their growth rates, further weakening the global economy. As a result, energy demand falls and the price of fossil fuels plummets, leading to a financial crisis for the energy-producing states, which are forced to cut back dramatically on expansion programs and social welfare. That in turn leads to political unrest: and nurtures different radical groups, including, but not limited to, Islamic extremists. The internal stability of some countries is challenged, and there are more “failed states.” Most serious is the collapse of the democratic government in Pakistan and its takeover by Muslim extremists, who then take possession of a large number of nuclear weapons. The danger of war between India and Pakistan increases significantly. Iran, always worried about an extremist Pakistan, expands and weaponizes its nuclear program. That further enhances nuclear proliferation in the Middle East, with Saudi Arabia, Turkey, and Egypt joining Israel and Iran as nuclear states. Under these circumstances, the potential for nuclear terrorism increases, and the possibility of a nuclear terrorist attack in either the Western world or in the oil-producing states may lead to a further devastating collapse of the world economic market, with a tsunami-like impact on stability. In this scenario, major disruptions can be expected, with dire consequences for two-thirds of the planet’s population.

### Commercialization

#### Technology doesn’t equate to non-proliferation – political considerations outweigh

Feiveson 1 (Harold, currently serves as the Secretary-Treasurer of the Federation of American Scientists Council and is a Senior Research Policy Scientist of the Program on Science and Global Security at Princeton University. “The Search for Proliferation-Resistant Nuclear Power” http://www.fas.org/faspir/2001/v54n5/nuclear.htm )

It should be recognized straight away that many in the nuclear industry worldwide believe that intrinsic or technical proliferation resistance should not be given much attention in the development of nuclear power. Their arguments are several. For example: Proliferation is manifestly a political problem. Therefore, it is counterproductive to impose technical constraints on the development of nuclear power except in a few problem countries, such as Iraq and North Korea. If countries are determined to obtain nuclear weapons they can do so most directly via a dedicated program and not through civil nuclear power. Institutional constraints - that is, the entire nonproliferation regime defined by the NPT, safeguards agreements, supplier agreements, etc. � are adequate and could be improved further without imposing technical constraints on nuclear power. The shape of technology, international politics, and ways people think about weapons of mass destruction are impossible to gauge over the long term. Indeed, nuclear weapons may in the future be far less a matter of concern than other weapons of mass destruction. Therefore, we cannot sensibly attempt today to design a proliferation-resistant nuclear future for the long term. In practice, it will be extraordinarily difficult to contrive an effective proliferation- resistant nuclear fuel cycle for sophisticated states, and difficult even to do so for unsophisticated states. To a point, there is merit in all of these arguments, and taken together they underscore the truth that the civilian nuclear fuel cycle is only a part, possibly even a small part, of the greater problem of addressing the proliferation of nuclear weapons and other weapons of mass destruction.

#### The US will not exercise leadership

Henry Sokolski, executive director of the Nonproliferation Policy Education Center, 2/7/12, Obama's Nuclear Mistake, www.nationalreview.com/blogs/print/290330

What prompted Obama to kick this political nest? A stunning inattention to nuclear-export realities, his own nuclear-control rhetoric, and history. In 2008, President Bush negotiated a nuclear-cooperative agreement with the United Arab Emirates (UAE). This agreement featured two new and important nonproliferation conditions. The first required the UAE to forswear making nuclear fuel — a process that can bring states to the very brink of acquiring bombs. The second stipulated that the UAE must open its nuclear facilities to intrusive nuclear inspections authorized under a special international understanding known as the Additional Protocol. While it negotiated this agreement with the UAE, the Bush administration also peddled its new, tougher conditions to existing and prospective U.S. civilian-nuclear-technology recipients, including Jordan, Egypt, Indonesia, Saudi Arabia, and Vietnam. Initially, this effort enjoyed President Obama’s support after he succeeded Bush: He put the final touches on the UAE deal and in 2009 sold it as the new nonproliferation “Gold Standard” for future civilian nuclear-cooperation deals. After a year’s effort trying to get Jordan, Vietnam, and South Korea to forswear making nuclear fuel, though, Team Obama started to go wobbly. First, in the late summer of 2010, Secretary of State Hillary Clinton announced that the U.S. had initialed a nuclear deal with Vietnam that lacked the Gold Standard conditions. The Hill went nuts. Letters were sent to the secretary of state, and State quietly put the Vietnam agreement on ice while the National Security Council ordered an interagency policy review. Deputy Secretary of State James Steinberg, who wanted to uphold the standard, fought Deputy Secretary of Energy Daniel Poneman, who did not. Nothing was decided. Then, in July of 2011, Steinberg left the government. In short order, Poneman prevailed over remaining resistance within State. Late last year, State resumed nuclear cooperation talks with Vietnam. Anxious to notify the Hill, as required by law, Undersecretary of State Eileen Tauscher and Deputy Secretary Poneman tried to arrange a private, classified briefing with the House and Senate foreign-affairs committee chairmen and ranking members. But all the important members were out of town. So instead, the two officials sent them a short note. It was a knee-slapper. First, it said the administration had decided that pushing the Bush administration’s Gold Standard would actually risk undermining nuclear nonproliferation. “We are concerned,” Tauscher and Poneman argued, that pushing this standard would “reduce[ ] the number of future U.S. partners, minimizing our nonproliferation influence.” Second, they noted that “France and Russia in particular are very aggressive in pursuing nuclear business,” that “neither imposes enrichment or reprocessing conditions in their agreements,” and that for every billion dollars of exports, the U.S. is able to support 10,000 jobs. So, if we want jobs, we have to back off pushing nuclear nonproliferation? That seems to be the letter’s conclusion. Yet it’s unclear if there are any significant U.S. reactor exports to be made, or any truly American vendors to make them. Nearly 80 percent of Westinghouse’s nuclear division is now Japanese- and Kazakhstani-owned; roughly half of General Electric’s is Japanese-owned. As for nuclear manufacturing, nearly all of that is now done overseas. Also, the Fukushima tsunami disaster has endangered whatever U.S. nuclear reactor or component exports might otherwise be left. Certainly prospective foreign customers have been loath to forswear suing U.S. nuclear firms in the case of a nuclear accident. Yet without such a pledge, U.S. vendors will not sell. The letter’s most egregious error, though, is its misreading of the nuclear market. Contrary to the two officials’ suggestion, the most profitable nuclear sales prospect is not overseas reactors, where profit margins can be negative. Instead, it’s supplying nuclear fuel to run the U.S.’s 104 power reactors, the world’s largest fleet. Russia and France are eager to penetrate this market. France is building a $4.8 billion fuel-fabrication plant in Georgia for the U.S. Department of Energy and has secured a $2 billion conditional federal loan guarantee to enrich uranium in Idaho. Russia would like to establish a similar U.S. enrichment project. Bottom line: If the U.S. wants to make a nuclear buck, doing so while maintaining nonproliferation standards depends far less on what other nuclear suppliers are doing overseas than those foreign suppliers’ export profits depend on securing U.S. taxpayer funds and loan guarantees. So far, however, Team Obama has avoided exploiting this leverage. Impatient, the House Committee on Foreign Affairs has reported out a bill (H.R. 1280) to push the Gold Standard by increasing congressional oversight over U.S. civilian nuclear-cooperative agreements. The Senate has yet to act.

NIMBY activism takes out the aff---no durable fiat, they only get to say the remove the restriction in the plan not all of the restrictions, and they cant influence public attitudes with fiat, otherwise the neg loses critical solvency arguments.

Andres 11 (Richard B. Andres is Professor of National Security Strategy at the National War College and a Senior Fellow and Energy and Environmental Security and Policy Chair in the Center for Strategic Research, Institute for National Strategic Studies, at the National Defense University. Hanna L. Breetz is a doctoral candidate in the Department of Political Science at The Massachusetts Institute of Technology. “Small Nuclear Reactors for Military Installations: Capabilities, Costs, and Technological Implications” http://www.ndu.edu/inss/docuploaded/SF%20262%20Andres.pdf)

Small reactors used on domestic military bases are likely to face a number of additional siting hurdles. As a distributed energy source, they are likely to face substantial “not-in-my-backyard” battles. Moreover, dispersing a large number of reactors leads to questions about longterm nuclear waste disposal.27 Arguably, reactors should be relatively safe on domestic military installations, certainly more secure than, for instance, the reactors situated in developing countries or intended for processing tar sands. Nevertheless, no issue involving nuclear energy is simple. Institutional and technical uncertainties—such as the security of sealed modules, the potential and unintended social and environmental consequences, or the design of reliable safeguards—make dispersing reactors across the country challenging. 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, and determining whether Permissive Action Links technology could be used to safeguard them.

#### NRC is bad at issuing permits---aff doesn’t do anything

Adams 11 (Rod Adams gained his nuclear knowledge as a submarine engineer officer and as the founder of a company that tried to develop a market for small, modular reactors from 1993-1999. He began publishing Atomic Insights in 1995 and began producing The Atomic Show Podcast in 2005. “Are small modular reactors (SMR) viable?” http://theenergycollective.com/rodadams/52950/energy-now-reports-excitement-associated-small-modular-reactor-developments)

There is no doubt that the Nuclear Regulatory Commission, without pressure to change by people who recognize the importance of that change, will do what it does best in response to the growing interest in SMRs. It will slowly, methodically, and unpredictably. It evaluate every single possible aspect of the designs, ask a ton of questions, lose track of some of the answers, ask more questions, open up the process to legal hearings and testimony by any intervenor who can establish standing, and eventually ensure that inpatient suppliers of financial resources find more productive investments.

No first movers---lack of credible demonstration creates a chicken and egg problem

Cunningham October 2012 (Nick Cunningham is a Policy Analyst for Energy and Climate at the American Security Project “Small Modular Reactors: A Possible Path Forward for Nuclear Power” http://americansecurityproject.org/ASP%20Reports/Ref%200087%20-%20Small%20Modular%20Reactors.pdf)

No Performance History The nuclear industry has maintained a high performance standard with its fleet of large light water reactors, and SMRs would need to demonstrate the same high performance. However, as with any new technology, SMRs have no track record to prove their performance. The industry lacks a credible demonstration project that would inform future projects and inspire confidence.36 SMRS need to demonstrate advantages over conventional plants, including advantages in cost, safety and flexibility. Looking forward, this creates a “chicken and egg” problem. In order to bring costs down, nuclear vendors will need a high-tech manufacturing facility to mass produce small reactors. However, in order to justify the construction of such a facility, the industry estimates it will need to book dozens of orders upfront. It cannot book these orders without proof of cost, safety and performance. Industry leaders are hesitant to be the “first-mover” in an uncertain market, and governments are reluctant to provide incentives or invest in unproven products.

#### Waste concerns

Cunningham October 2012 (Nick Cunningham is a Policy Analyst for Energy and Climate at the American Security Project “Small Modular Reactors: A Possible Path Forward for Nuclear Power” http://americansecurityproject.org/ASP%20Reports/Ref%200087%20-%20Small%20Modular%20Reactors.pdf)

Nuclear Waste Disposal of spent nuclear fuel has confounded the nuclear industry for decades and the problem of waste disposal will still need to be dealt with for SMRs. While large reactors suffer from the same problem, expanding the use of SMRs would mean waste from more reactor sites would need to be coordinated.38 The quantity of waste may not change, but a given amount of waste is easier to manage from one site, rather than multiple. The problem of disposing nuclear waste is a serious one, and the lack of a solution despite 30 years of debate is troubling. In January 2010, President Obama setup a Blue Ribbon Commission (BRC) to study the problem and to recommend actions to finally address the nuclear waste problem. The BRC recommended the establishment of a consent-based approach to siting a waste facility, the development of interim storage 7 facilities, the creation of a separate government entity tasked only with addressing nuclear waste, as well as several other recommendations.39 The recommendations will be difficult to pass through Congress, but until resolved, the nuclear waste problem will bedevil the entire nuclear industry, including SMRs.

SMR’s are the worst---costly, regulations means no investment

Economist 12 (“Over the rainbow If there are better ways to split atoms, they will be a long time coming” http://www.economist.com/node/21549096)

At the moment, those who want to bring down the cost of nuclear power are not, for the most part, looking at big generation IV reactors that will not be built for 20 years, if ever. Instead, they are thinking small. Particularly in America, small modular reactors (SMRs) of up to 300MW are all the rage. Some, such as the 100MW mPower reactor offered by Babcock and Wilcox, are scaled-down PWRs. Others are more exotic. Think small Such reactors can reach markets which today's big reactors cannot. Many utilities—and smaller countries—have little interest in gigawatt-scale plants: they prefer to build around 100MW of capacity at a time. Small reactors might also open up new applications, perhaps in desalination, district heating or even transport. He Zuoxiu, a Chinese physicist critical of his government's rush to build lots of big PWRs, has suggested that SMRs for ships, both military and merchant, would be a good way to train up a cadre of engineers and designers. SMRs can also be slotted into underground silos, which cuts down on civil engineering costs. Perhaps most promising of all, they would be built in factories, not on site. That should make them less subject to delay than manufacture in the field. And a factory building ten such reactors a year for years on end might be able to make significant cost reductions through incremental improvements—economies of number as opposed to economies of scale. But these advantages do not add up to a conclusive case for a small modular future. Babcock and Wilcox claim overnight costs per kilowatt of capacity for the mPower roughly on a par with those of big PWRs like the AP1000. But in an industry that has long pursued economies of scale, many are unconvinced that smaller reactors can deliver the same costs per kilowatt. Atam Rao, who led the design of an advanced generation III reactor, GE's ESBWR, describes such claims as “complete BS”. Things like control systems are needed for all reactors, big or small. Providing them for each small reactor is bound to push up costs. Will any utility really think it makes sense to field ten SMRs with ten control systems and ten safety systems rather than one big PWR? Only if it has seen it done economically elsewhere. In the end, that is the biggest problem for proponents of new approaches to nuclear energy. If a radically new technology, as opposed to an incremental one, is to take off, it needs not only to be researched and developed; it needs to be deployed, and industry will not do this until it has seen the technology work. It was the American navy's deployment of nuclear reactors that convinced the world that they could be used as power generators. And it was the experience of deploying them that allowed Admiral Rickover, in the 1950s, to sum up the gap between ideas that might work and those that are in fact working, in a way that still seems spot on 60 years later: An academic reactor or reactor plant almost always has the following basic characteristics: (1) It is simple. (2) It is small. (3) It is cheap. (4) It is light. (5) It can be built very quickly. (6) It is very flexible in purpose. (7) Very little development will be required. It will use off-the-shelf components. (8) The reactor is in the study phase. It is not being built now. On the other hand a practical reactor can be distinguished by the following characteristics: (1) It is being built now. (2) It is behind schedule. (3) It requires an immense amount of development on apparently trivial items. (4) It is very expensive. (5) It takes a long time to build because of its engineering development problems. (6) It is large. (7) It is heavy. (8) It is complicated. Innovators need to be able to take risks, to try variations on their ideas and to be able to learn. They flourish in unregulated markets. They frequently depend on venture-capital funds which are dwarfed by the cost of even a single utility-scale power plant. They also need rewards. Yet makers of nuclear reactors cannot take risks that might compromise safety, and they cannot try lots of different things because it would be too expensive. And even if they succeed, all they will be making is commoditised electricity. Power stations are not conducive to radical innovation. Nuclear reactors, as Philippe Jamet notes, last for centuries; the technology is, by its own standards, still young. Longevity and inertia ensure that even a disaster like Fukushima cannot wipe it from the world. But they also ensure that it cannot grow fast. In energy in general, technologies mature and succeed each other over decades. Nuclear seems likely to lag behind even in this slow field. That does not mean it will not, eventually, play a larger role, but that it will get there slowly. Inside a reactor, things can change in milliseconds. Outside, it takes lifetimes.

#### NG prices

Cunningham October 2012 (Nick Cunningham is a Policy Analyst for Energy and Climate at the American Security Project “Small Modular Reactors: A Possible Path Forward for Nuclear Power” http://americansecurityproject.org/ASP%20Reports/Ref%200087%20-%20Small%20Modular%20Reactors.pdf)

Low Natural Gas Prices Another problem that is not unique to SMRs, but plagues the nuclear industry as a whole, is the current low prices of natural gas. Due to major advances in hydraulic fracturing and horizontal drilling, the U.S. is awash in natural gas. Prices have plummeted, and the Energy Information Administration (EIA) estimates that prices will rise very slowly over the next two decades. For example, in their 2012 Annual Energy Outlook, the EIA predicts that natural gas prices will not rise back above $6 per million Btu until around 2030.40 SMRs may need natural gas prices to reach $7 or $8 per million Btu to be competitive.41 This makes any new nuclear power plant, including an SMR, uneconomical compared to natural gas. Unless natural gas prices rise more quickly than expected, or Congress implements a price on carbon, nuclear power may struggle to compete.

#### No nuclear exports---

#### Nuclear liability

DOC 10 (Department of Commerce, “The Commercial Outlook for U.S. Small Modular Nuclear Reactors” http://trade.gov/publications/pdfs/the-commercial-outlook-for-us-small-modular-nuclear-reactors.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.

Manufacturing capability

DOC 10 (Department of Commerce, “The Commercial Outlook for U.S. Small Modular Nuclear Reactors” http://trade.gov/publications/pdfs/the-commercial-outlook-for-us-small-modular-nuclear-reactors.pdf)

There are also domestic policies that hinder U.S. SMR competitiveness, with some policies relevant to all nuclear suppliers and some specific to SMR deployment, both at home and abroad. One obstacle is diminished manufacturing capacity. U.S. nuclear competitiveness is hampered because U.S. manufacturing capacity has been eroded through the lack of new reactor construction during the past few decades. Some government resources to help manufacturers are not appropriate for nuclear suppliers, or the resources exclude the suppliers entirely. For example, only two U.S. nuclear manufacturers qualified for the advanced energy manufacturing tax credit. The timeline to be eligible for the credit requires a facility to be up and running four years from certification. Some U.S. firms say that the timeline is too short for many nuclear suppliers; just acquiring the high-precision machines necessary to retool and rebuild capacity can require a lead time of several years. Some U.S. suppliers also note that the United States currently levies tariffs between 3.3 percent and 5.2 percent on key nuclear reactor components, but the tariffs are currently suspended in some cases (specifically for reactor pressure vessels and steam turbine generators that were ordered before July 31, 2006). Tariffs around the world, particularly in the European Union and South Korea, are higher on such components. Coupled with significant foreign government support, foreign suppliers can more easily enter the U.S. market, while U.S. manufacturers face a significant trade barrier in key foreign markets.

#### Export licensing

DOC 10 (Department of Commerce, “The Commercial Outlook for U.S. Small Modular Nuclear Reactors” http://trade.gov/publications/pdfs/the-commercial-outlook-for-us-small-modular-nuclear-reactors.pdf)

Generally, SMR vendors say that additional 123 agreements (see terminology note) are needed with new markets overseas to legally permit U.S. companies to engage in trade of major nuclear reactor components and fuel with those markets. Once the 123 agreements are in force, U.S. companies may still need to obtain authorizations and licenses from the Departments of Commerce, Energy, and State, as well as from the Nuclear Regulatory Commission (NRC). Many companies say that the process is challenging to navigate. The Department of Commerce, through its Civil Nuclear Trade Initiative, published the “Civil Nuclear Exporters Guide” in 2009 to help U.S. companies with this process.8 According to some U.S. suppliers, several other U.S. government policies may pose challenges to SMR deployment. For example, to meet the requirements of the Omnibus Budget Reconciliation Act of 1990, as amended, the NRC assesses a uniform annual fee for each licensed nuclear power reactor under 10 CFR Part 171.9 The total annual fee for each operating power reactor includes a spent fuel storage and reactor-decommissioning annual fee. Separate from the annual fees assessed under 10 CFR Part 171, an annual premium for the nuclear liability insurance pool is required by the Price–Anderson Act. In 2009, the NRC issued an Advance Notice of Proposed Rulemaking to consider whether to amend 10 CFR Part 171 to establish a variable annual fee structure for power reactors based on the reactor’s licensed power limit contained in the operating license. If the NRC issued regulations based on a variable fee structure accounting for reactor size, then it is reasonable to assume that the annual fee assessed to SMRs would be less than the annual fee assessed to the current large LWRs.

#### SMR results in regulatory overstretch and prolif

Lyman 2011 (Edwin, Senior Scientist, Global Security Program Union of Concerned Scientists “An Examination of the Safety and Economics of Light Water Small Modular Reactors” Before the Energy and Water Development Subcommittee Committee on Appropriations U.S. Senate July 14, 2011 http://www.ucsusa.org/assets/documents/nuclear\_power/lyman-appropriations-subcom-7-14-11.pdf)

UCS is also concerned that reducing safety and security requirements for SMRs could facilitate their sale to utilities or other entities in the United States and abroad that do not have prior experience with nuclear power. Some SMR vendors argue that their technology is so safe that it can be deployed to remote areas, military bases, and countries in the developing world that have relatively low electric demand and no nuclear experience or emergency planning infrastructure. However, SMRs deployed in this manner could raise additional safety and security concerns compared to their deployment by established and experienced nuclear utilities. The distributed deployment of small reactors would also put great strains on existing licensing and inspection resources. Nuclear reactors are qualitatively different from other types of generating facilities, not least because they require a much more extensive safety and security inspection regime. Similarly, deployment of individual small reactors at widely distributed and remote sites around the world would strain the resources of the International Atomic Energy Agency (IAEA) and its ability to adequately safeguard reactors to guard against proliferation, since IAEA inspectors would need to visit many more locations per installed megawatt around the world. Maintaining robust oversight over vast networks of SMRs around the world would be difficult, if feasible at all.

#### 1. Proliferation is stable

Dratler 10 (Jay, Goodyear Professor of Intellectual Property, Emeritus Ph.D. degrees in physics from the University of California (San Diego), and a J.D. degree from Harvard Law School, where he was articles editor of the Harvard Law Review. “The Case for Nuclear Proliferation” <http://jaydiatribe.blogspot.com/2010/04/case-for-nuclear-proliferation.html>)

**The strongest argument for nuclear proliferation is** not speculation, but history**. Since the first and only use of nuclear weapons** (against Japan in 1945), **no one has invaded a country that had them,** with the possible exception of Israel. **Besides brief border skirmishes, all significant armed conflicts since 1945 but one have involved nuclear haves fighting in nuclear have-nots**, or have-nots fighting among themselves. Here’s the list: 1947: India (have-not) and Pakistan (have-not) over partition and Kashmir (have not) 1950-53: North Korea (have-not) in South Korea (have-not) 1950-53: US (have) and allies in South Korea (have-not) against North Korea (have-not) and China (have) 1950-53: China (have) in North Korea (have-not) and South Korea (have-not) against US (have) 1954-63: France (have) in Indochina (have-not) 1965: India (have-not) in Pakistan (have-not) over Kashmir (have-not) 1967: Soviet Union (have) in Hungary (have-not) 1968: Soviet Union (have) in Czechoslovakia (have-not) 1971: India (have-not) in Pakistan (have-not), creating Bangladesh (have-not) 1964-75: US (have) in Vietnam (have-not) 1979-89: Soviet Union (have) in Afghanistan (have-not) 1982: UK (have) in Falklands (have-not) against Argentina (have-not) 1983: US (have) in Grenada (have-not) 1989: US (have) in Panama (have-not) 1991: US (have) in Iraq (have-not) (Operation Desert Storm) 1995: US (have) and NATO (have) in bombing campaign in Bosnia and Kosovo (have-nots) 2001-present: US (have) in Iraq (have-not) (Operation Iraqi Freedom) 2001-present: US (have) in Afghanistan (have-not) 2008: Russia (have) in Georgia (have-not) [Other colonial actions, which involved haves against colonized have-nots, are not listed. Nor are civil wars and conflicts in Africa, all of whose nations are nuclear have-nots.] **The only exception** known to me **is Pakistan’s brief invasion of India** (in 1999, over Kashmir, as usual). That invasion occurred when both nations had nuclear weapons. But India’s strong conventional response and enormous international pressure stopped it. Other possible but unproven exceptions involved foreign invasions of Israel in 1967 and 1973, when Israel may have had nuclear weapons but, if it did, didn’t reveal or use them. The conclusion that follows from this list in inescapable. Since the development of nuclear weapons, major powers possessing them (except for India and Pakistan) were too prudent or too civilized to make war among themselves. **The unbroken record of military carnage that had preoccupied and devastated Eurasia and most of the “civilized” world for the previous two centuries stopped in its tracks**. But **the record of carnage continued in smaller countries lacking nuclear weapons**, either because they fought among themselves, or (more often) because they were invaded or fought over by nuclear powers. Looking at these data, **an unbiased observer has to conclude that nuclear weapons, with their unthinkable potential consequences, don’t cause wars.** They prevent them**.** The destructive power of nuclear weapons is war’s reductio ad absurdum. It demonstrates graphically how pointless, senseless and useless war is. That is a lesson that Europe and the rest of the world should have learned (but didn’t) from World War I, a serious attempt at mutual genocide that accomplished absolutely nothing. Better late than never.

#### Even “rogue states” won’t cause conflict with nukes

Dratler 10 (Jay, Goodyear Professor of Intellectual Property, Emeritus Ph.D. degrees in physics from the University of California (San Diego), and a J.D. degree from Harvard Law School, where he was articles editor of the Harvard Law Review. “The Case for Nuclear Proliferation” <http://jaydiatribe.blogspot.com/2010/04/case-for-nuclear-proliferation.html>)

Rogue Regimes After terrorists and crazies, **rogue regimes are the next strongest argument against nuclear proliferation**. **What would happen, conventional wisdom screams, if a terrible tyrant got nuclear weapons**? Conventional wisdom acts as if this question highlights a mere hypothetical future peril. But it doesn’t. Terrible tyrants have had and have nuclear weapons, and nothing extraordinary has happened. With the possible exception of Hitler, **Stalin was the worst** tyrant in human history. He was certainly the most paranoid. Yet he had nuclear weapons for four years before he died. **He didn’t use them**. Nor did his Soviet successors. **North Korea’s Kim Jong Il is every bit as paranoid as Stalin and far more prone to making idle external threats. Yet he has done nothing rash** and is unlikely to do so. Why? Because he knows that a single 50-megaton thermonuclear bomb could erase Pyongyang and his regime forever, even if he and a few select leaders managed to survive in some deep bunker. He also knows that his four-million-strong starving army is no proof against the atom’s awesome power. So Kim waits and occasionally blusters. Waits for what? If he or his minions have any semblance of wisdom, they will exploit the reduction in paranoia that their small nuclear arsenal permits and begin improving their civilian economy. If and as that happens, the long-suffering North Korean people will begin a gradual and painful climb toward a better life. It may take decades. It may take a century. But eventually **cooler and wiser heads will prevail amidst the stalemate of multilateral nuclear deterrence. Conventional wisdom acts as if there were some easy external “solution” to localized tyrannies,** if only they didn’t have nuclear weapons. But **history reveals that view as nonsense**. The Castro brothers, Kim, and Mugabe have been around for decades. They are all likely to die peacefully, of old age. No external force seriously challenged them during their (and Kim’s father’s) long reigns. No external force seriously challenges them now although only Kim has an arguable nuclear deterrent. What would change if each of them had a small nuclear arsenal? Their countries are small enough to be easy subjects for others’ nuclear deterrence. **A few missiles could literally annihilate their entire nations. The only real difference a small nuclear arsenal might make would be giving the lie to the paranoid fear of foreign invasion that they use to keep their own people’s aspirations in check**. The proof of the pudding is Iraq. Part of our justification for invading was removing the tyrant Saddam. That wasn’t the main reason; Israel and oil were. But never mind. It was a reason with which every supporter of the war—left or right—(including me, before the blunders started) could agree. Soon we will have spent well over a trillion dollars in direct and indirect costs. We will have suffered over 4,000 dead and 30,000 wounded to remove a tyrant who we thought had weapons of mass destruction but didn’t. That expense and the enormous economic drain of two wars are among the principal reasons for our national decline. With our sad example in mind, the rest of the world is unlikely to challenge local tyrants by conventional invasion for a century, if ever. Certainly the world’s most rapidly rising power (China) will not. And we have found it like pulling teeth to get our NATO allies to contribute to the supposedly agreeable mission of fighting the tyrannical Taliban in Afghanistan. So the notion that rogue regimes would be more susceptible to external “regime change” without than with nuclear weapons is sheer fantasy. **The notion that local tyrants would commit personal and national suicide by starting a nuclear war is equally absurd.** The Castro brothers, Kim Jong Il, and Robert Mugabe will die peaceably of old age, and their successors will change their policies. **Or their smarter underlings or people will remove them. It is impossible to foresee, let alone predict, that their possession of nuclear weapons would make any difference at all**. The only difference it might make is assuaging their paranoia enough to let them spend less on tools of war and more on their people, if only to improve the chances of their regimes’ survival against mutiny or popular revolt.

#### 2. And no incentive to strike first – risk of failure

Waltz 2k—Kenneth, pol sci prof at Berkeley (Georgetown Journal of International Affairs, Volume 1, Number 1, Winter/Spring 2000, Interviewed by Jeremy Goldberg & Parag Khanna “Interview: Is Kenneth Waltz Still M.A.D. about Nukes?”, <http://www.ciaonet.org/olj/gjia/gjia_winspr00f.html>)

Proximity also does not mean vulnerability. **Every country has enough space to move its weapons around; in order for me to believe that your force is vulnerable and consider a preemptive attack, I have to convince myself that I know exactly how many deliverable nuclear weapons you have. So if I think you have twelve weapons, I’ve got to know you don’t have a couple more**. I’ve got to be sure that’s the number. And if I persuade myself that you have twelve and no more, I have to know where they are, and I have to be sure that you do not move them by the time I decide to attack. It’s estimated by Herbert York, former director of Lawrence Livermore National Laboratories, that a country making a relatively crude nuclear warhead would be able to make one weighing less than a ton–small enough to place in a van and move around. Journal Some military analysts would contend that India’s conventional superiority makes Pakistan’s nuclear capability vulnerable, largely because Pakistan relies on its air capability to deliver weapons, and in a conventional war, its air capability could be destroyed very quickly. Could that development, with the implications on Pakistan’s inability to withstand a preemptive attack, possibly disrupt nuclear stability? Waltz You’ve got to be sure that in an attack, whether with nuclear weapons or conventional weapons, you’re attacking weapons. Now, it’s hard–nuclear weapons are small–to be sure that you’re going to destroy those weapons quickly and completely. With conventional weapons you at least have the illusion of control; that is, you can defend, you can delay, and you can exact a toll from the enemy. The ultimate question is whether you are going to win or lose. If you are fighting with nuclear weapons the issue is survival, not necessarily physically, but as a political entity. Military commanders are well aware of how many things can go wrong: failed intelligence, undetected warheads in an unexpected location. If Pakistan has two dozen nuclear weapons spread around and at least four or five India does not know about, is India going to attack and risk four or five warheads blowing up Indian cities? While the attack might not destroy India, what could be at stake that would be worth that price? It’s a risk to their regime, it’s a risk to rulers, and it’s a risk to the military. You don’t get much enthusiasm out of the military for fighting wars it’s going to lose.

#### And empirics are on our side

Bzostek 5 (Rachel, PhD Candidate Pol. Sci. “WHY NOT PREEMPT? AN ANALYSIS OF THE IMPACT OF LEGAL AND NORMATIVE CONSTRAINTS ON THE USE OF ANTICIPATORY MILITARY ACTIVITIES ”, August, <http://etd.lsu.edu/docs/available/etd-06302005-104805/unrestricted/Bzostek_dis.pdf>)

Anticipatory Military Activities: Do States Preempt? While there are a plethora of different factors that could influence the likelihood of a state’s using anticipatory military activities, a few generalizations can be made. For one, it appears that uncertainty, which underlies most of the concepts discussed above, and is applicable to both the capabilities and the intentions of the adversary, tends to increase, at least hypothetically, the probability of a state using anticipatory military activities to deal with threats posed by an adversary. This is primarily due to the fact that states tend to expect the worst from their adversary. Or, in other words, as the adage goes, it’s better to be safe than sorry. But, is this actually the case? If uncertainty is truly as rampant and detrimental as many scholars suggest, and if taking anticipatory military action is seen as an effective tool for dealing with this uncertainty, one would expect to see states frequently employing these activities. But, as Reiter notes, for the most part states do not take anticipatory action. It is important to note that the absence of such actions does not necessarily imply a corresponding lack of uncertainty. To be sure, there are numerous different elements at play, all of which must be taken into consideration. However, it is also true that just as the influence of many of the international security concepts can be underestimated, they can also be overestimated, leaving a situation of partial understanding. In this respect, Chapters 6 through 8 seek to rectify at least part of this problem by integrating and including concepts from a variety of different sources, specifically, through adding legal and normative elements into the analysis. Several scholars have empirically tested various hypotheses about preemptive and preventive war using concepts and theories derived from the international security literature. While there is diversity vis-à-vis the explanatory variables used in these studies, there appears to be consensus with respect to the conclusions: states rarely use anticipatory military activities. Before discussing these conclusions, it is important to look at the different explanations and hypotheses tested in these studies.

3. New proliferators will build small arsenals – uniquely stable.

Seng, 1998

[Jordan, PhD Candidate in Pol. Sci. – U. Chicago, Dissertation, “STRATEGY FOR PANDORA'S CHILDREN: STABLE NUCLEAR PROLIFERATION AMONG MINOR STATES”, p.203-206]

However, this "state of affairs" is not as dangerous as it might seem. The nuclear arsenals of limited nuclear proliferators will be small and, consequently, the command and control organizations that manage chose arsenals will be small as well. The small arsenals of limited nuclear proliferators will mitigate against many of the dangers of the highly delegative, 'non-centralized' launch procedures Third World states are likely to use. This will happen in two main ways. First, only a small number of people need be involved in Third World command and control. The superpowers had tens of thousands of nuclear warheads and thousands of nuclear weapons personnel in a variety of deployments organized around numerous nuclear delivery platforms. A state that has, say, fifty nuclear weapons needs at most fifty launch operators and only a handful of group commanders. This has both quantitative and qualitative repercussions. Quantitatively, the very small number of people 'in the loop' greatly diminishes the statistical probability that accidents or human error will result in inappropriate nuclear launches. All else being equal, the chances of finding some guard asleep at some post increases with the number of guards and posts one has to cover. Qualitatively, small numbers makes it possible to centrally train operators, to screen and choose them with exceeding care, 7 and to keep each of them in direct contact with central authorities in times of crises. With very small control communities, there is no need for intermediary commanders. Important information and instructions can get out quickly and directly. Quality control of launch operators and operations is easier. In some part, at least, Third World states can compensate for their lack of sophisticated use-control technology with a more controlled selection of, and more extensive communication with, human operators. Secondly, and relatedly, Third World proliferators will not need to rely on cumbersome standard operating procedures to manage and launch their nuclear weapons. This is because the number of weapons will be so small, and also because the arsenals will be very simple in composition. Third World stares simply will not have that many weapons to keep track of. Third World states will not have the great variety of delivery platforms that the superpowers had (various ballistic missiles, cruise missiles, long range bombers, fighter bombers, missile submarines, nuclear armed ships, nuclear mortars, etc., etc.), or the great number and variety of basing options, and they will not employ the complicated strategies of international basing that the superpowers used. The small and simple arsenals of Third World proliferators will not require highly complex systems to coordinate nuclear activities. This creates two specific organizational advantages. One, small organizations, even if they do rely to some extent of standard operating procedures, can be flexible in times of crisis. As we have discussed, the essential problem of standard operating procedures in nuclear launch processes is that the full range if possible strategic developments cannot be predicted and specified before the fact, and thus responses to them cannot be standardized fully. An unexpected event can lead to 'mismatched' and inappropriate organizational reactions. In complex and extensive command and control organizations, standard operating procedures coordinate great numbers of people at numerous levels of command structure in a great multiplicity of places. If an unexpected event triggers operating procedures leading to what would be an inappropriate nuclear launch, it would be very difficult for central commanders to “get the word out' to everyone involved. The coordination needed to stop launch activity would be at least as complicated as the coordination needed to initiate it, and, depending on the speed of launch processes, there may be less time to accomplish it. However, the small numbers of people involved in nuclear launches and the simplicity of arsenals will make it far easier for Third World leaders to 'get the word out' and reverse launch procedures if necessary. Again, so few will be the numbers of weapons that all launch operators could be contacted directly by central leaders. The programmed triggers of standard operating procedures can be passed over in favor of unscripted, flexible responses based on a limited number of human-to-human communications and confirmations. Two, the smallness and simplicity of Third World command and control organizations will make it easier for leaders to keep track of everything that is going on at any given moment. One of the great dangers of complex organizational procedures is that once one organizational event is triggered—once an alarm is sounded and a programmed response is made—other branches of the organization are likely to be affected as well. This is what Charles Perrow refers to as interactive complexity, 8 and it has been a mainstay in organizational critiques of nuclear command and control s ystems.9 The more complex the organization is, the more likely these secondary effects are, and the less likely they are to be foreseen, noticed, and well-managed. So, for instance, an American commander that gives the order to scramble nuclear bombers over the U.S. as a defensive measure may find that he has unwittingly given the order to scramble bombers in Europe as well. A recall order to the American bombers may overlook the European theater, and nuclear misuse could result. However, when numbers of nuclear weapons can be measured in the dozens rather than the hundreds or thousands, and when deployment of those weapons does not involve multiple theaters and forward based delivery vehicles of numerous types, tight coupling is unlikely to cause unforeseen and unnoticeable organizational events. Other things being equal, it is just a lot easier to know all of what is going on. In short, while Third World states may nor have the electronic use-control devices that help ensure that peripheral commanders do nor 'get out of control,' they have other advantages that make the challenge of centralized control easier than it was for the superpowers. The small numbers of personnel and organizational simplicity of launch bureaucracies means that even if a few more people have their fingers on the button than in the case of the superpowers, there will be less of a chance that weapons will be launched without a definite, informed and unambiguous decision to press that button.

#### Yes they will build small arsenals, fallout fear economic constraints, opacity

#### Seng, 1998

[Jordan, PhD Candidate in Pol. Sci. – U. Chicago, Dissertation, “STRATEGY FOR PANDORA'S CHILDREN: STABLE NUCLEAR PROLIFERATION AMONG MINOR STATES”, p.56-57]

Kenneth Waltz argues that leaders in all new nuclear states will build only small arsenals. His claim rests primarily on the assumption that all new nuclear states will believe they only need to threaten adversaries with the destruction of one or two cities to ensure stable deterrence, and that they subsequently will be reluctant to dedicate massive resources to building large nuclear arsenals.' My claim is less broad, and it concerns only stares in the developing world. I argue that conditions in the developing world are such that whether leaders think they need to be able to destroy only one city or believe they should have the capability to achieve complete societal destruction of an adversary, they very likely will judge that only very small nuclear arsenals are needed for the job. Moreover, because conditions are such that arsenal buildups will exact high economic, political and security costs on developing states, it is very unlikely they will build more weapons than they believe they need. What follows is an examination of the specific conditions on which these claims are based. There are five main reasons to expect small arsenals among nuclear states in the developing world. They include 1) the limited number of targets developing states will have to worry about, 2) fears concerning 'regional suicide' through nuclear fallout, 3) economic constraints related to nuclear production and military budgets, 4) the specific manner in which developing states reap political rewards and prestige from nuclear weapons development, and 5) the requirements of keeping nuclear arsenals opaque. These factors can carry a cumulative weight in developing state proliferators, which is to say that their cumulative effect may serve to constrain arsenal buildup when the individual effect of any one of them may not be sufficient. They also reinforce each other in important ways, meaning that if policymakers recognize the existence of one or some of the conditions they are likely to recognize most or all of them, and thus their cumulative weight is likely CO be felt. Not all the factors discussed here will apply to all proliferators and potential proliferators in the developing world; however, it is not necessary that they do. It is simply necessary that enough of the factors apply, or that one of them applies strongly enough, to generate the essential constraining effects. This is very likely to be the case in all developing world situations.

### Grid/Hegemony

#### Plan takes too long – empirical tests show it’ll take over 10 years

Kate Anderson 10, Senior Engineer in the Integrated Applications Office, National Renewable Energy Laboratory, 2/1/10, “SMALL NUCLEAR REACTORS,” <https://smr.inl.gov/Document.ashx?path=DOCS%2FReading+Room%2Fgeneral%2FNuclear+White+Paper+by+NREL+020110.pdf>

Small nuclear reactors were originally developed for defense applications. The US Navy began developing small nuclear reactors for naval propulsion in the early 1950s, and today operates more than 100 reactors aboard aircraft carriers, other surface ships, and submarines. The Army Nuclear Power Program ran between 1954 and 1976, with 8 small reactors constructed to power remote operations. The program was discontinued due to the poor economics of nuclear plants relative to cheaper alternative fuels available at the time.3 Today, the Army is studying small transportable reactor concepts for power, water, and synfuel production4,5 and the use of mobile nuclear reactors has been suggested for expeditionary forces.6 The Air Force explored nuclear powered aircraft, but discontinued the program in 1961. Today, they are considering fielding small nuclear reactors on domestic bases. In January 2008 the Air Force issued a request for proposals, looking for a private company that would be interested in building small nuclear reactors on Air Force bases. However, Air Force spokeswoman Vicki Stein says the Air Force is 12 to 14 years away from building such a power plant.7

Their evidence is all hype---emergency access AND waste hinder effectiveness

Baker 12 (Matthew Baker is a writer for the American security project blog, “Do Small Modular Reactors Present a Serious Option for the Military’s Energy Needs?” http://americansecurityproject.org/blog/2012/do-small-modular-reactors-present-a-serious-option-for-the-militarys-energy-needs/)

Congressman Bartlett also pointed out that current military bases such as Guam – which is fueled by the transport of diesel – are extremely vulnerable should the energy transport system be disrupted. Fuel supplies are even more unstable in Afghanistan, where one out of every twenty-four convoys results in a casualty. According to Congressman Bartlett, SMRs could make such bases energy self-sufficient. Unfortunately all the hype surrounding SMRs seems to have made the proponents of SMR technology oblivious to some of its huge flaws. Firstly like large reactors, one of the biggest qualms that the public has to nuclear is problems associated with nuclear waste. A more decentralized production of nuclear waste inevitably resulting from an increase in SMRs production was not even discussed. The danger of transporting gas into some military bases in the Middle East is already extremely volatile; dangers of an attack on the transit of nuclear waste would be devastating. Secondly, SMRs pose many of the same problems that regular nuclear facilities face, sometimes to a larger degree. Because SMRs are smaller than conventional reactors and can be installed underground, they can be more difficult to access should an emergency occur. There are also reports that because the upfront costs of nuclear reactors go up as surface area per kilowatt of capacity decreases, SMRs will in fact be more expensive than conventional reactors. Thirdly, some supporters of SMR technology seem to have a skewed opinion of public perception toward nuclear energy. Commissioner of the U.S. Nuclear Regulatory Commission, William C. Ostendorff, didn’t seem to think that the recent Fukushima disaster would have any impact on the development on SMRs. Opinion polls suggest Americans are more likely to think that the costs of nuclear outweigh its benefits since the Fukushima disaster. For SMRs to be the philosopher’s stone of the military’s energy needs the public needs to be on board. The DESC’s briefing did illustrate the hype that the nuclear community has surrounding SMRs, highlighting some pressing issues surrounding the military’s energy vulnerability. But proponents of SMRs need to be more realistic about the flaws associated with SMRs and realize that the negative impacts of nuclear technology are more costly than its benefits.

SMR’s won’t be deployed on other bases

Wong ’12 (Kelvin Wong, Kelvin Wong is an Associate Research Fellow at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University. He is with the Military Studies Programme at the School’s constituent unit, the Institute of Defence and Strategic Studies, “The Military’s Quest for Nuclear Power”, <http://rolandsanjuan.blogspot.com/2012/05/beyond-weapons-militarys-quest-for.html>, May 18, 2012)

Synopsis The military has always maintained an interest in the application of nuclear energy in its operations. In a bid to reduce logistical strain caused by power-hungry bases and vehicles operating over significant distances, some military forces have experimented with nuclear technology to seek potential solutions. However, it is unlikely that such concepts will become a mainstream reality. Commentary In April 2012 American scientists unveiled a radical plan for advanced unmanned aerial vehicles (UAV) powered by ‘next generation concepts’. The proposal, titled ‘Unmanned Air Vehicle Ultra Persistence Research’ was jointly developed by Sandia National Laboratories – the US government’s principal nuclear research and development agency – and military contractor Northrop Grumman. The research team noted that the application of such persistent technologies to UAVs would dramatically extend flight times, as well as enable more powerful sensor and weapon systems to be fitted. The proposal all but established that the team had been experimenting with nuclear propulsion concepts, especially when considering Sandia’s background and the research team’s concern over political sensitivities of nuclear power. Nuclear power: more than destruction Military exploitation of nuclear power has not always been limited to weapons of mass destruction and large naval platforms. As early as the 1940s, American scientists experimented with a salt-based nuclear reactor concept for civilian aircraft propulsion. However, early designs lacked durability and it was not till 1954 that a stable reactor was built at the Oak Ridge National Laboratory. During the Cold War, both the United States and the Soviet Union experimented with nuclear technology for its military aircraft, with the same intention to develop intercontinental bombers capable of reaching virtually any target on the planet. American defence contractors at the behest of the United States Air Force (USAF) investigated the feasibility of nuclear powered military aircraft, which was never realised as a result of cost and technical limitations, as well as crew safety concerns. On the other side of the Bering Strait, the Soviet Union also pursued its own nuclear-powered aircraft development. Despite promising results from limited flight-testing, Soviet military interest in the nuclear-powered bomber soon faded in favour of more cost-effective ballistic missile systems. There had also been an interest in the application of nuclear power for land-based forces during the same period. From early 1950 to late 1970 the US military had investigated the possibility of deploying smaller-scale and portable nuclear reactors in a bid to reduce logistical challenges imposed by energy-dependent vehicles and military bases. For example, a 1963 study submitted to the US Department of Defense (DOD) proposed the use of a small nuclear reactor as the power source for an energy depot. The proposal, called the military compact reactor (MCR), was an attempt to solve the logistics problem of supplying fuel to military vehicles on the battlefield. While military vehicles could not derive power directly from the nuclear reactor, the MCR could provide power to produce synthetic fuel to replace conventional petroleum fuel. In addition to the MCR, US Army engineers had also successfully operated a series of compact nuclear reactors in remote military bases, and even considered the use of nuclear power overseas to provide uninterrupted power in the event that US bases were cut off from regular supply lines. However, further development of the MCR ceased due to the cost and technical limitations. Other concepts had been more successful. From 1968 to 1975, the US Army operated a floating nuclear reactor which supplied electrical power in the Panama Canal Zone. Even though it proved its worth, the floating reactor eventually ceased operation due to high costs and the cancellation of the Army’s nuclear research programme. Civilian and military nuclear incidents Despite improvements in nuclear safety, public sentiment on nuclear power is generally unfavourable, particularly after a series of high-profile nuclear incidents over the years. Disasters like Chernobyl, Three Mile Island, and the recent Fukushima episodes have sorely demonstrated the perils of operating nuclear reactors, emanating be it from human error or natural calamities. Military forces have also been stung by peacetime nuclear incidents. In March 2008, the American nuclear submarine USS Houston leaked minute amounts of radiation into Sasebo naval base while on a port call, triggering condemnation from Japanese citizens in the district. In the same year, the British nuclear submarine HMS Trafalgar leaked hundreds of litres of radioactive wastewater into a nearby river while docked at Devonport naval base, raising concerns from nuclear safety experts. Mainstream nuclear power in the military? Yet military scientists have not ceased to be tempted by the potential of nuclear power. In response to increasing oil prices and global supply uncertainties, and well-documented cases of logistical strain on forces operating in the Middle East in recent conflicts, the US Defense Advanced Research Projects Agency (DARPA) issued a proposal for innovative solutions in deployable compact nuclear reactors in 2010. In the proposal, DARPA outlined the need to reduce the logistical burden of supplying forward operating bases and forces without access to reliable fuel supply lines. The proposal also suggested that materials science have advanced to the stage where it might have a positive impact on deployable nuclear reactor research. While recent developments suggest that nuclear power technology can potentially be employed in unmanned aircraft and on the ground, it is unlikely to have mainstream military utility. The Cold War period was an era when general attitudes towards nuclear energy were quite favourable, and military experimentation was only limited by funding and scientific expertise. In contrast, nuclear power today has become a hotly debated issue despite its importance in powering the economies of advanced nations today. For the military, the problem with nuclear power is not just about cost and safety, but also of the nature of its operating environment. Deploying volatile nuclear reactors into harm’s way on the battlefield, where their destruction and sabotage are likely, should give military planners cause to pause.

No islanding---pentagon hates it

Snider 12 (Annie Snider, E&E reporter “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."

#### No great power war – liberal order and nuclear weapons check.

Ikenberry 2011

G. John, professor of Politics and International Affairs @ Princeton, America’s Challenge: The Rise of China and the Future of Liberal International Order, New American Foundation, July 2011, http://asp.newamerica.net/sites/newamerica.net/files/policydocs/Ikenberry,%20John%20-%20Americas%20Challenge%20-%20The%20Rise%20of%20China%20and%20the%20Future%20of%20Liberal%20International%20Order.pdf

In particular, three features of the American-led international order seem distinctive – features that have contributed to its success and longevity. First, more so than with imperial systems of the past, the Western order is built around rules and norms of non-discrimination and market openness – creating conditions for rising states to participate within the order and advance their expanding economic and political goals within it. Across history, international orders have varied widely in terms of whether the material benefits that are generated accrue disproportionately to the leading state or the material benefits of participation within the order are more widely shared. In the Western system, the barriers to economic entry are low and the potential benefits are high. China has already discovered the massive economic returns that are possible through operating within this open market system. A second feature of the Western order is the coalition-based character of its leadership. This is an order in which a group of advanced liberal democratic states work together and assert collective leadership. It is not just an American order; a wider group of states are bound together and govern the system. These leading states do not always agree but they are engaged in a continuous process of give and take over economics, politics, and security. This too is distinctive. Past orders have tended to be dominated by one state. The stakeholders in the current order include a coalition of status quo great powers that are arrayed around the old hegemonic state. This is important. Power transitions are typically seen as playing out in dyadic fashion between two countries: a rising state and a declining hegemon. This larger aggregation of democratic capitalist states – and the resulting aggregation of geopolitical power – shifts the balance back in favor of the old order. A final feature of the Western order is its unusually dense, encompassing, and agreed upon rules and institutions. International order can be rigidly hierarchical and governed by coercive domination exercised by the leading state or it can be relatively open and organized around reciprocal, consensual and rule-based relations. The postwar Western order has been more open and rule-based than any previous order. State sovereignty and the rule of law are not just norms enshrined in the United Nations charter. They are part of the deep operating logic of the order. To be sure, these norms are evolving, and America itself has historically been ambivalent about binding itself to international law and institutions, and at no time more than today. But the overall system is remarkably dense with multilateral rules and institutions – global, regional, economic, political, and security. These institutional creations are one of the great breakthroughs of the postwar era: establishing the basis for greater levels of cooperation and shared authority and governance of the global system. Together these features of Western order give it an unusual capacity to accommodate rising powers. Its sprawling landscape of rules, institutions, and networks provide newer entrants into the system with opportunities for status, authority, and a share in the governance of the order. Access points and mechanisms for political communication and reciprocal influence abound. China has incentives and opportunities to join in while, at the same time, the possibilities of actually overturning or subverting this order are small or nonexistent. This is particularly the case because of one other feature of the order: the United States, China and other great powers have nuclear weapons. In the past, old international orders were ultimately overturned through hegemonic war. In the age of nuclear weapons and great power deterrence, this mechanism of historical change – thankfully – is taken away. War-driven change is removed as a historical process. These characteristics of the Western order have implications for how a rising China makes choices, increasing incentives to join rather than seek to overturn it. Seen in this light, the modern international order is not really American or Western. It is both wider and deeper. American hegemonic leadership did become a critical feature of liberal international order in the postwar era. But the foundations, rules, and institutions that constitute that order have preceded the American-era of leadership and go well beyond it. We can look more closely at the principles and institutions of this modern order, focusing specifically on how its features might attract and accommodate a rising China.

## 2NC

### Rnwbl da

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#### New tech

Seif 2/16/12 (Dan, a senior consultant with RMI's electricity and industrial practices, and is focusing on industrial efficiency and solar PV thrusts., From 2000 to 2005 Dan was with the semiconductor manufacturer Advanced Micro Devices, Inc. (AMD) where Dan led the corporate manufacturing resource (energy, water, and chemicals) optimization and GHG emissions reduction programs. He moved on from AMD to the Harvard Kennedy School, and from there became an investment associate with the renewable energy private equity firm US Renewables Group (USRG). At USRG Dan was involved in the management of operational companies (biomass power plants in CA and NY) and investment evaluations involving emergent technologies, including the USRG investments in bio-based acrylic acid (OPX Biotechnologies, Inc. in Boulder, CO), MSW-to-ethanol (Fulcrum BioEnergy, Inc. in Pleasanton, CA), and waste heat-to-electricity (Alphabet Energy, Inc. in Haywood, CA). Education University of Virginia, Bachelor of Science, Chemical Engineering, 1997 University of Arizona, Masters of Science, Chemical Engineering, 2000 Harvard Kennedy School, Masters in Public Administration, 2007 “Natural Gas Boom Won’t Stall U.S. Renewable” <http://blog.rmi.org/natural_gas_boom_wont_stall_us_renewables>)

A boom is projected to accelerate in distributed solar photovoltaic (PV) development, which is less affected by low natural gas prices. While utility-scale renewable generation must compete against wholesale prices, distributed renewable installations such as solar panels on a factory roof compete against retail power rates. Those projects generate electricity used on site and reduce that business's bill at the higher retail rates, which on a national average continue to rise despite falling wholesale prices. While the retail rates are rising, solar PV development costs are rapidly decreasing. By the beginning of 2013, crystalline (industry “standard”) solar module costs are predicted by energy analysts to reach 70 cents/watt, dropping total cost of commercial installations to approximately $2.70/W and residential installations to about $3.60/W, based on Department of Energy SunShot data. These whole-system installation prices represent reductions of more than 50 percent from as recently as 2007. Grid parity, the point at which renewables are price competitive with the existing grid, primarily based on coal- and gas-fired electricity generation, has already begun, with average retail prices in Hawaii above those levels, as are top retail prices in other states, such as California. While Hawaii and California feature some of the most expensive retail rates in the U.S., the fact that they have attained grid parity for many retail ratepayers indicates more areas will reach the grid parity tipping point with each penny drop in the price of solar PV installations.

#### Filling in for natural gas

Seif 2/16/12 (Dan, a senior consultant with RMI's electricity and industrial practices, and is focusing on industrial efficiency and solar PV thrusts., From 2000 to 2005 Dan was with the semiconductor manufacturer Advanced Micro Devices, Inc. (AMD) where Dan led the corporate manufacturing resource (energy, water, and chemicals) optimization and GHG emissions reduction programs. He moved on from AMD to the Harvard Kennedy School, and from there became an investment associate with the renewable energy private equity firm US Renewables Group (USRG). At USRG Dan was involved in the management of operational companies (biomass power plants in CA and NY) and investment evaluations involving emergent technologies, including the USRG investments in bio-based acrylic acid (OPX Biotechnologies, Inc. in Boulder, CO), MSW-to-ethanol (Fulcrum BioEnergy, Inc. in Pleasanton, CA), and waste heat-to-electricity (Alphabet Energy, Inc. in Haywood, CA). Education University of Virginia, Bachelor of Science, Chemical Engineering, 1997 University of Arizona, Masters of Science, Chemical Engineering, 2000 Harvard Kennedy School, Masters in Public Administration, 2007 “Natural Gas Boom Won’t Stall U.S. Renewable” <http://blog.rmi.org/natural_gas_boom_wont_stall_us_renewables>)

Cheap natural gas presents a challenge to utility-scale renewable power growth over the next couple of years, but increased distributed solar PV deployment may bridge the gap. RMI is working with utilities, public service commissions, financiers, and others empowered to enable PV deployment to exploit and accelerate this near-term opportunity. Long term, the relentless cost curve of both utility-scale wind and solar PV—as well as natural gas’s and coal’s environmental and market dynamic factors—will inevitably lead to accelerated build-out of renewable power.

#### Job growth

CNBC 12

AtisSun, 6/16/12, “Renewable Energy VS. Fossil Fuels: America’s Energy Future” www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&ved=0CIcBEBYwCQ&url=http://www.atissun.com/blog/7932/renewable-energy-vs-fossil-fuels-americas-energy-future/&ei=OHXnT429OcP00gGHttDSCQ&usg=AFQjCNHk0iKSvA5K0-S8TeJmENbM7VLEzQ

President Obama’s campaign focuses on the job creation potential of the clean energy industry, and not without justification.

There is considerable reason to believe that the renewable energy industry will continue to experience a period of explosive growth: according to the International Renewable Energy Agency (IRENA), off-grid electricity alone will create 4 million jobs worldwide over the next 2 decades. More specifically to the United States, the American solar industry is booming and generating domestic employment at an unprecedented rate. The National Solar Jobs Census in 2011 reported that employment growth in the solar industry was 10 times above the national average that year. Conservative estimates report that 100,000 Americans are employed in the solar sector; that number is expected to increase 24 percent this year.

#### Quarterly stats

Pen Energy 12

June 14, 2012, “U.S. solar surges in first quarter” <http://www.pennenergy.com/index/power/display/0122557813/articles/pennenergy/power/renewable/2012/june/u_s_-solar_surges.html>

Despite concerns about how it would handle the end of a critical federal subsidy program, the U.S. solar power industry saw explosive growth at the start of 2012, according to the latest report from the Solar Energy Industries Association. All told the country added more than 506 megawatts of solar power installations, bringing the total solar capacity to more than 4.4 gigawatts. Probably the biggest surprise of the first quarter is that California was actually unseated as the largest solar market, at least for one quarter, replaced by long-time runner-up New Jersey. The Garden State alone added 174 megawatts of solar power installations, more than one-third of the U.S. total and more than half of what the state added in all of 2011. Meanwhile, California added 148 megawatts, or around one-quarter of its 2011 total. "The U.S. solar industry continues to lead the U.S. out of difficult economic times," said Rhone Resch, president and CEO of SEIA. "Installations have grown by 85 percent in the last year. This growth is coming from consumers who are turning to solar to reduce their energy costs. In states across the country, Americans are waking up to the realization that putting solar on your home or business is a better investment than the stock market."

### Rnwbls good

---Technology already exist to solve warming-deployment key, 1nc evidence cites the IPCC, here is more

Romm-Fellow at American Progress and is the editor of Climate Progress-9/26/11

World’s Engineers: “The Technology Needed to Cut the World’s Greenhouse Gas Emissions by 85% by 2050 Already Exists”

<http://thinkprogress.org/climate/2011/09/26/329233/world%E2%80%99s-engineers-technology-cut-greenhouse-gas-emissions-exists/>

The technology needed to cut the world’s greenhouse gas emissions by 85% by 2050 already exists, according to a joint statement by eleven of the world’s largest engineering organisations…. The statement says that generating electricity from wind, waves and the sun, growing biofuels sustainably, zero emissions transport, low carbon buildings and energy efficiency technologies have all been demonstrated. However they are not being developed for wide-scale use fast enough and there is a desperate need for financial and legislative support from governments around the world if they are to fulfil their potential. That’s the news release from the UK’s Institution of Mechanical Engineers (IME), one of the 11 signatory groups. The groups explicitly call for a peak in global emissions in 2020 and an intensive effort to train workers for green technology jobs.

---Aggressive deployment of existing technology key to emissions reductions---deployment will create innovation.

Romm-Fellow at American Progress and is the editor of Climate Progress-10/31/11

<http://thinkprogress.org/climate/2011/10/31/356735/revkin-sheen-report-debunks-anti-deployment-climate-strategy/>

Back in May, a major study, California’s Energy Future — the View to 2050, was released by an independent state science and technology advisory panel. It had two central findings: California can achieve emissions roughly 60% below 1990 levels with technology we largely know about today if such technology is rapidly deployed at rates that are aggressive but feasible. We could further reduce 2050 greenhouse gas emissions to 80% below 1990 levels with significant innovation and advancements in multiple technologies that eliminate emissions from fuels. All of these solutions would require intensive and sustained investment in new technologies plus innovation to bridge from the laboratory to reliable operating systems in relatively short timeframes. This report is an incredibly strong endorsement of the “deploy, deploy, deploy, research & develop, deploy, deploy, deploy,” strategy that I and others have been advocating. In fact, the report explicitly states that failing to adopt “Aggressive efficiency measures for buildings, industry and transportation” and “Aggressive electrification to avoid fossil fuel use” would “significantly increase the 2050 emissions.” Amazingly, Revkin asserts the exact opposite in “A Reality Check on Ambitious Climate Targets.” Certainly misreporting on energy and climate in the NY Times is legion, as we’ve seen. But Andy Revkin’s latest head-exploding post easily wins the “Charlie Sheen” award. A leading journalist and climate expert, Robert Collier, debunked Revkin’s “real spinning of the report” — see “Sticking the long knives into energy efficiency” (reposted below). It’s worth spending some time on this because the report’s actual conclusions and implications are very important to understand. I have long asserted that it is not possible to make a positive contribution to the climate debate if you don’t spell out what your emissions or temperature target (or range) is. Revkin’s post proves that conclusively, as I will show.

Revkin’s glass-is-one-tenth-empty caption: “An analysis finds that California will not meet its climate target for 2050 even with a wartime-scale push on energy efficiency and installing non-polluting technologies like these solar panels in a housing subdivision in Rocklin.” Revkin claims in his post: Given that California is a best-case scenario\* compared to other states (and, of course, countries) far more dependent on coal, Long’s piece and the underlying report pose a strong challenge to those calling for a “deploy, deploy, deploy” approach to cutting climate risks. This is a link to – and swipe at — me, needless to say. Blunder number one is for Revkin to assert the report challenges the aggressive deployment strategy for meeting ambitious climate targets. Quite the reverse. The report makes clear that without aggressive deployment, the target can’t possibly be reached. Revkin added the asterisk (\*) because, buried way, way at the bottom of his post is this Postcript, In a Twitter reaction, Alan Nogee, the former clean-energy program director for the Union of Concerned Scientists, noted that California’s lack of coal dependence makes it more a worst case than a best case, because it doesn’t have a lot of coal emissions that might be relatively easily displaced. Duh. Rather than an asterisk, Revkin should simply remove his misleading error. The fact is that California has been pushing efficiency and low-carbon electricity aggressively since the 1970s. It is considerably more efficient in its use of energy than almost every other state. For a long time now the CO2 intensity of its electricity (CO2/Mwh) has been nearly half that of the rest of the nation. So obviously the rest of the country — which is far more coal-intensive and inefficient — has considerably more low-hanging fruit for emissions reductions. That’s blunder two. Blunder three is really the most amazing and amusing. Revkin appears to be unaware that a 60% reduction vs. 1990 levels is the target that the IPCC believes the rich countries (Annex I) should adopt if the goal is to stabilize at 550 ppm CO2-eq. I discussed the science underlying this at length two years ago. Here’s the key chart from the full Working Group III report (Box 13.7, page 776): Now 550 ppm CO2-equivalent is about 450 ppm CO2 (because of the warming from the other greenhouse gases), and it means ultimately stabilizing at 3°C (5.4°F) above preindustrial levels using the “best estimate” of climate sensitivity — see the IPCC’s Synthesis Report “Summary for Policymakers” (Table SPM.6). Of course, Revkin continues to this day to only endorse his vague R&D-focused “energy quest” and criticize those of us (including the National Academy of Sciences) who push for strong emissions reductions starting now. Since Revkin refuses to tell us what level of concentrations he thinks the world should aim for – even a broad range, say 450 ppm to 550 ppm — he retains the luxury of attacking those who are willing to state what their target is while maintaining a faux high ground that they are being politically unrealistic while he can pretend his essentially do-nothing do-little\* strategy is scientifically or morally viable, which it ain’t. That said, based on his new post, Revkin apparently thinks the target should be stronger than 550 ppm CO2-eq. After all, it’s quite clear from the California report, which he does not dispute, that we should be able to meet the 60% below 1990 levels target by aggressively deploying existing technology. And yet Revkin says the report is a strong challenge to those of us who believe our climate strategy should be based on aggressive deployment. So apparently that target is too weak for Revkin since you only need the major technology advances for the stronger target. On the other hand, it’s hard to believe that he supports the 450 ppm CO2-eq target, which is roughly stabilization at 2°C given the IPCC’s best estimate for climate sensitivity. He has spent so much time criticizing me and others who do lay out strategies to meet that target (and yes, those strategies include more R&D — everybody but the hard-core libertarians and fossil fuel types support more clean energy R&D). Moreover, if Revkin does believe in the stronger target, his post makes even less sense. He would be implying that because we can only go most of the way with existing technology therefore we MUST NOT START aggressive deployment until we have every piece of technology available. Otherwise, why not start aggressive deployment now? Obviously, the report he cites doesn’t take that absurd view since it would mean a staggeringly greater amount of emissions in the near term — which means we would need even more breakthroughs and an incomprehensibly fast rate of deployment. There just is no logic underlying Revkin’s post or his critique of aggresive deployment. The bottom line is that by failing to spell out what target or range he supports, Revkin’s critique of aggressive deployment implodes. Indeed, it backfires. It proves he cannot make a positive contribution to the debate until he spells out his climate target. For the record, I do not know a single environmentalist who would not gladly agree to a bill requiring a nation-wide 2050 GHG target of a 60% reduction below 1990 levels — with aggressive deployment plus R&D and a reevaluation of the target every 10 years based on advances in science and technology. Revkin seems painfully unaware of the fact that one of the best way to get major technology advances — if not the best way — is by deployment, not R&D (as I’ve explained many times, see “The breakthrough technology illusion“) and in any case the two aren’t mutually exclusive. Finally, it bears repeating that, as we learned in 2009, “The world will have to spend an extra $500 billion to cut carbon emissions for each year it delays implementing a major assault on global warming, the International Energy Agency said on Tuesday.” Aggressive deployment (along with more R&D) is the only cost-effective strategy if you want to avoid catastrophic global warming. Here is Collier’s must-read piece: Sticking the long knives into energy efficiency A new, authoritative study has concluded that California can reduce its total greenhouse gas emissions by 60 percent from 1990 levels by 2050 using technologies that already exist or are in demonstration. By nearly any measure, that’s good news. It shows that serious action on global warming is feasible right now and does not require futuristic technological breakthroughs that might never come to fruition.

### Scheffran

#### ---Nuclear power makes climate negotiations impossible and global renewable shift impossible

Scheffran et al 2011

Jürgen Scheffran is Professor at the Institute for Geography and head of the Research Group Climate Change and Security at the KlimaCampus of Hamburg University. He is a member of the World Future Council’s Peace and Disarmament Working Group and serves on the Board of Editors of the Nuclear Abolition Forum, Climate Change, Nuclear Risks and Nuclear Disarmament: From Security Threats to Sustainable Peace, May 17th 2011, <http://www.worldfuturecouncil.org/fileadmin/user_upload/PDF/110517_WFC_Scheffran_Report.pdf>

Whether nuclear risks and climate change will lead to more conflict or cooperation will depend on how human beings and their societies respond to these challenges. In the 1992 United Nations Framework Convention on Climate Change (UNFCCC), countries agreed to prevent dangerous anthropogenic interference with the climate system. In the 2009 Copenhagen Accord, most nations supported the goal of limiting global temperature change to 2 degrees Celsius by the end of the century, but failed to define concrete steps toward that goal. During his election campaign in 2008, candidate Barack Obama committed to an 80 percent reduction of CO2 emissions by the middle of the century, a goal that has not been further pursued during his presidency. Throughout 2010, progress in climate policy was blocked by Republican resistance in the US Congress; meanwhile, carbon emissions have continued to rise. The agreement of Cancun in December 2010 offers a path forward, but requires determined efforts by the major polluters. Obama also spoke in favour of a nuclear weapon-free world in Berlin in 2007 and in Prague in 2009, but so far concrete measures have lagged behind rhetoric. While the 2010 Nuclear Posture Review offers some promising language, more concrete is the decision of the Obama administration to increase the budget for nuclear weapons development. The New Strategic Arms Reduction Treaty (New START) is a moderate and important step towards further reduction of the US and Russian nuclear arsenals. Its ratification in the US Senate in December 2010 demonstrates that the strong resistance at the domestic front can be overcome, albeit at the cost of meeting the Republican Party’s demands for a modernization of the nuclear arsenals. On the international level, the goal of nuclear abolition has found wide support, in particular in recent resolutions in the UN General Assembly and a vote by the UN Security Council in 2009. A focal point of activities was the NPT Review Conference in May 2010 where a number of NGOs and countries expressed their support for a Nuclear Weapons Convention (NWC) that would implement the comprehensive goal of a world without nuclear weapons (ICAN 2010). The final document of the conference noted UN Secretary-General Ban Kimoon’s five-point proposal for nuclear disarmament of 24 October 2008, ―which proposes, inter alia, consideration of negotiations on a nuclear weapons convention or agreement on a framework of separate mutually reinforcing instruments, backed by a strong system of verification‖ (NPT 2010). Many states and anti-nuclear civil society groups see negotiation of a NWC as politically feasible and necessary to move beyond the current disarmament stalemate (Scheffran 2010a, Ware 2010). So far, major progress has not been achieved due to resistance from the nuclear weapon states. If the nuclear and climate problems are not tackled comprehensively but remain stuck in piecemeal approaches, one problem could impede solving the other. As long as countries acquire nuclear power and nuclear weapons, arms races and threat perceptions could spoil international relations, which in turn could undermine the conditions for cooperative climate policies. On the other hand, progressing climate change could undermine human and international security, causing incentives to use violent means to protect resources and interests. To avoid such a doomsday scenario, it is essential to strengthen the positive linkages between both policy areas. Negotiations on roadmaps for nuclear disarmament and carbon emission reduction could overcome the stalemate in both areas. Regional approaches could help to trigger global solutions, such as establishing Nuclear WeaponFree Zones (NWFZ) in the Middle East, Northeast Asia and the Arctic (see figure 15 for existing NWFZs). Regional partnerships in environmental security could prevent disasters in climate hot spots and support the capacity building of societies against the risks of climate change. In a win-win scenario, nuclear disarmament would improve the conditions for climate cooperation which, in turn, would support an international political climate that would make nuclear weapons increasingly obsolete.

#### Climate change leadership is key to relations with the EU

Pataki and Vilsack et al 2008

George, former governor of New York, Thomas, former governor of Iowa, Confronting Climate Change: A Strategy for US Foreign Policy, Council on Foreign Relations Report, <https://docs.google.com/viewer?a=v&q=cache:qiW_DLn2DxMJ:www.cfr.org/content/publications/attachments/Climate_ChangeTF.pdf+&hl=en&gl=us&pid=bl&srcid=ADGEESixSiFdq4iu0xEhynKLJSLRiC-MbEHZ_kFiX302AAjsUI88VmuZ9gfDXIm8vW33CqQfhttyYC8uzkzhYrwt_XSCq_qGLDqSJAVJ2bGvnhMfvYVWBwejl0lE7D_VjR7aOJpsC7O_&sig=AHIEtbTTVt_aKX-p3-JU48jgnpHxpoeolw>

Climate change policy also provides an opportunity to mend U.S. relations with other countries. Among the advanced industrialized nations, the United States is viewed as the country that has been slowest to develop a credible climate policy. The shape of U.S. policy has many origins. The United States found it especially difficult to meet the emissions targets set forth in the Kyoto Protocol primarily because its own emissions rose rapidly during the economic boom of the late 1990s and because it chose not to require emissions reductions; the European Union, by contrast, has seen its emissions rise much less sharply for a variety of reasons linked to its slower population growth, generally less robust economic expansion, fortuitous changes in its energy systems, and its active policies to cut emissions.20 The perceived lack of a sufficiently aggressive U.S. policy, along with the United States’ failure to ratify the Kyoto Protocol at a time when many in the world view climate change as a paramount danger for the planet, has undercut U.S. credibility in addressing global challenges. To be certain, the United States has adopted a variety of policies that will lead emissions to be lower than they otherwise would be, something discussed in more detail in the next chapter. But combined with an array of other policy differences, the U.S. approach to the climate problem has harmed the transatlantic alliance, long a bedrock of U.S. foreign policy. With climate change a top priority for most major U.S. allies in Europe, engaging in a way that is seen as serious and constructive has the potential to rebuild weakened relationships and accrue goodwill that would be useful across the U.S. foreign policy agenda. At the same time, climate change diplomacy, which will involve every major country in the world, also provides the United States an opportunity to build and intensify relationships that will be important well beyond the climate arena. U.S. leadership on climate change would also help steer any global approach in a direction that the United States finds to be in its interests.

#### relations solve bioterror.

Daniel Hamilton, Director of the Center for Transatlantic Relations at Johns Hopkins University, June 11, 2003, Future of Transatlantic Relations, FDCH Congressional Testimony, p. lexis

It is unlikely that a successful effort to strengthen homeland security can be conducted in isolation from one's allies. The U.S. may be a primary target for Al-Qaeda, but we know it has also planned major operations in Europe. A terrorist WMD attack on Europe would immediately affect American civilians, American forces, and American interests. If such an attack involved contagious disease, it could threaten the American homeland itself in a matter of hours. The SARS epidemic, while deadly, is simply a "mild" portent of what may be to come. Bioterrorism in particular is a first-order strategic threat to the Euro-Atlantic community. A bioterrorist attack in Europe or North America is more likely and could be as consequential as a nuclear attack, but requires a different set of national and international responses. Europeans and Americans alike are woefully ill-prepared for such challenges. In the aftermath of the September 11 attacks, it has become very clear that controlling borders, operating ports, or managing airports and train stations in the age of globalization involves a delicate balance of identifying and intercepting weapons and terrorists without excessively hindering trade, legal migration, travel and tourism upon which European and American prosperity increasingly depends. Efforts to protect the U.S. homeland against cyberattack, for example, can hardly be conducted in isolation from key allies whose economies and information networks are so intertwined with ours. Unless there is systematic trans-European and trans-Atlantic coordination in the area of preparedness, each side of the Atlantic is at greater risk of attack.

#### Extinction

John D. Steinbruner, Brookings senior fellow and chair in international security, vice chair of the committee on international security and arms control of the National Academy of Sciences, Winter **19**97, Foreign Policy, “Biological weapons: a plague upon all houses,” n109 p85(12), infotrac

Although human pathogens are often lumped with nuclear explosives and lethal chemicals as potential weapons of mass destruction, there is an obvious, fundamentally important difference: Pathogens are alive, weapons are not. Nuclear and chemical weapons do not reproduce themselves and do not independently engage in adaptive behavior; pathogens do both of these things. That deceptively simple observation has immense implications. The use of a manufactured weapon is a singular event. Most of the damage occurs immediately. The aftereffects, whatever they may be, decay rapidly over time and distance in a reasonably predictable manner. Even before a nuclear warhead is detonated, for instance, it is possible to estimate the extent of the subsequent damage and the likely level of radioactive fallout. Such predictability is an essential component for tactical military planning. The use of a pathogen, by contrast, is an extended process whose scope and timing cannot be precisely controlled. For most potential biological agents, the predominant drawback is that they would not act swiftly or decisively enough to be an effective weapon. But for a few pathogens - ones most likely to have a decisive effect and therefore the ones most likely to be contemplated for deliberately hostile use - the risk runs in the other direction. A lethal pathogen that could efficiently spread from one victim to another would be capable of initiating an intensifying cascade of disease that might ultimately threaten the entire world population. The 1918 influenza epidemic demonstrated the potential for a global contagion of this sort but not necessarily its outer limit.

### At grid

#### Renewables solve supply disruptions better

Lovins 2007

Amory B., Cofounder and Chief Scientist of the Rocky Mountain Institute, 1993 MacArthur Fellow, one of the TIME 100 most influential people and Foreign Policy 100 Influential thinkers., Nuclear Power and Climate Change, Bulleting of Atomic Scientists September 2007, “Nuclear is Uneconomic” <http://thebulletin.org/web-edition/roundtables/nuclear-power-and-climate-change>

On the supply side, "micropower"--small-scale generation that emits little or no carbon dioxide--provided one-sixth of the world's electricity and one-third of its new electricity in 2005, meeting from one-sixth to more than one-half of all electrical needs in 13 industrial countries. The smaller of micropower's components, distributed renewable sources of electricity, was a $56 billion global equipment market in 2006, while the larger, combined-heat-and-power, was probably even larger. Micropower added four times the electricity and 8-11 times the capacity that nuclear power added globally in 2005, now produces more electricity than nuclear power does, and is financed by private risk capital. Micropower plus "negawatts," which are probably about as big, now provide more than half of the world's new electrical services. Nuclear power is unnecessary and uneconomic, so we needn't debate its safety. As retirements of aging plants overwhelm construction, global capacity and output will decline (as they did slightly in 2006). Most independent analysts doubt the private capital market will finance any new nuclear plants. Even in the United States, where new subsidies would roughly repay the next six units' entire capital cost, Standard & Poor's said this wouldn't materially improve the builders' credit ratings. I expect this experiment will be like defibrillating a corpse: It'll jump, but it won't revive. Nuclear power's market meltdown is good for global development: Saving electricity needs around 1,000 times less capital and repays it about 10 times faster than supplying more electricity. Shifting capital to saving electricity can potentially turn the power sector (now gobbling one-fourth of global development capital) into a net funder of other development needs. Further, an efficient, diverse, dispersed, and renewable energy system can make major supply failures, whether caused by accident or malice, impossible by design rather than (as now) inevitable by design. The nuclear phaseout will also speed climate protection, because buying negawatts and micropower instead will save 2-10 times more carbon per dollar, and will do so more quickly. And it can belatedly stem nuclear proliferation, too, by removing from commerce a vast flow of ingredients of do-it-yourself bomb kits in civilian disguise.

#### Renewables are comparatively best at solving blackouts

PR Newswire 3 (“Wind Power Developers Convene in Wyoming, Discuss Wind's Long-term Benefits to the Environment, the Economy and the Grid” http://www.prnewswire.com/news-releases/wind-power-can-help-prevent-the-next-blackout-70976537.html)

Grid stability can be achieved through distributed generation -- placing generating facilities throughout the region's grid so that when one section of the grid goes down, the distribution facilities are able to keep the rest of the grid in operation. Wind farms are particularly suitable for this strategy because they are scalable in nature and therefore can be sized according to local energy needs. Fossil fuel plants, on the other hand, can work only as large-scale power plants. Additionally, wind farms, which can be plugged directly into a metropolitan area like New York City or a local pocket such as Long Island, can also ease transmission bottlenecks. The transmission bottlenecks north of New York City that likely contributed to the Blackout of 2003 could have been reduced had a wind farm in close proximity been in place and operating -- such as the off-shore project currently proposed for the south shore of Long Island. "One of the most attractive features of wind power and off-shore wind, in particular, is the ability to site a plant close to where the electricity will be used," said Tom Gray, Deputy Executive Director of the American Wind Energy Association. "The recent blackout makes a compelling case for a wind plant off of Long Island that can deliver electricity directly to neighboring communities and the region." Another benefit of wind power in a blackout situation is that as long as the grid is operating, a wind power facility can begin generating electricity almost immediately. In contrast, nuclear and fossil fuel plants must go through long restart and warm-up procedures of up to 48 hours. Time is also reduced in the development of wind power generating facilities, which can be built in just six to nine months. A conventional power plant generally cannot be completed from design to operation in less than two years.

### Cp

#### Renewables solve

Hargreaves 11

(Steve, CNN Money, “For the military clean energy saves lives”, 8/17, http://money.cnn.com/2011/08/17/technology/military\_energy/index.htm)

One out of eight U.S. Army casualties in Iraq was the result of protecting fuel convoys.

This statistic, derived from an Army study looking at fuel convoys in Iraq from 2003 to 2007, is a powerful incentive for the military to move away from oil and toward renewable energy, and that's exactly what it's doing.

From experimental solar-powered desert bases for the Marines to Navy robots that run on wave energy, the military is quickly becoming a leading buyer of cutting-edge renewable energy technology.

For the armed services, the benefits extend beyond reducing fuel convoy casualties. A fighting force that isn't restricted by the reach of a tanker truck or weighted down by heavy batteries is more nimble and, as a result, more lethal.

For renewable energy companies, the military is proving to be a vital customer, buying the latest in clean energy gadgets and encouraging private investment. The hope is the armed services can shepherd this technology to the point where it becomes commercially viable, much like it did a generation ago for GPS systems or the Internet.

#### DOD Microgrids avoid Cyberterror risk

Sater-Research Fellow at Global Green USA’s Security and Sustainability Office-11

Military Energy Security: Current Efforts and Future Solutions

http://globalgreen.org/docs/publication-185-1.pdf

Cybersecurity remains one of the leading challenges impeding the development of a smart grid. In January 2011, the GAO published a report on the progress being made on cybersecurity as it related to smart grids 71 . Unfortunately, the report did not specifically address microgrids. The GAO found six challenges, however, to the development of a smart grid. The DOD is nonetheless well suited to handle the challenges listed by the GAO and the confinement of microgrids to military installations should mitigate many cybersecurity risks. The challenges listed by the GAO and the advantages of military microgrids for cybersecurity appear below. Challenge 1: Aspects of the regulatory environment may make it difficult to ensure smart grid systems’ cybersecurity. The federal government and state governments regulate electricity production and distribution. Having multiple entities produce regulations can lead to conflicting rules and thus confusion. Microgrids on military installations should avoid many of the regulatory issues the GAO found with the smart grid. The confinement of microgrids to military bases means that only the DOD will have regulatory control over them. There is precedent for states to exempt military installations from state regulations. According to a different GAO report, states often excluded military installations from their renewable energy-production goals. 72 Furthermore, it is unlikely that any state government would want to get into the politically untenable battle with the Pentagon over issuing competing regulations governing military bases. Challenge 2: Utilities are focusing on regulatory compliance instead of comprehensive security. Microgrid cybersecurity will benefit from having the same entity, the DOD, issue the microgrid regulations and own the microgrids. Utilities have little incentive to invest in security measures past the bare minimum necessary for regulatory compliance. However, unlike a utility, the DOD will suffer in the event of a cybersecurity failure and thus has incentives to pursue comprehensive security. Challenge 3: The electric industry does not have an effective mechanism for sharing information on cybersecurity. Different utility companies across different states do not have a central authority analogous to that which military bases have in the Pentagon. Though there will certainly be bureaucracy, the DOD has more capacity to share information about cybersecurity and cyber-attacks than utilities. Challenge 4: Consumers are not adequately informed about the benefits, costs, and risks associated with smart grid systems. The DOD can take steps to inform all of its employees about microgrids in ways that may not be available to utilities to inform their customers. The DOD could require short classes on the benefits and risks of microgrids for all its employees and more rigorous education for its base commanders and others making decisions about grid implementation. A utility company cannot require its customers to take a class. A utility’s best option for educating its customers would be to send out information packets with monthly bills and hope that consumers read them. Challenge 5: There is a lack of security features being built into certain smart grid systems. Given the importance of the DOD’s mission and the potentially catastrophic repercussions of lax cybersecurity, the Pentagon will not take the security of its microgrids lightly, especially with the recent publication of the “Department of Defense Strategy for Operating in Cyberspace.” 73 Challenge 6: The electricity industry does not have metrics for evaluating cybersecurity. The lack of evaluation metrics is a serious problem, but the DOD could instruct USCYBERCOM to create a specific set of metrics for microgrid development.

#### ---The CP creates advanced microgrids that solve their islanding advantage-Extend our Defense Communities evidence-its cites a MIT Lincoln Laboratory study that says advanced mircogrids can allow bases to maintain critical missions if there is grid disruption

#### ---To be clear advanced microgrids have a number of features that solve all of their grid internal links-These include islanding the microgrid if the main grid is disrupted, securing critical loads during emergencies, and accelerating the use of renewable energy sources and energy efficiency.

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Microgrid Definition A microgrid resembles the smart grid in many ways except on a smaller scale. For the purposes of this paper, a microgrid shall be able to perform the following functions: • Perform demand management during normal operating conditions • Island the microgrid from the main grid once an upstream fault is detected • Secure critical loads and shed non-critical loads according to the given priority list during emergencies • Resynchronize the microgrid to the main grid after an upstream fault is cleared • Optimally coordinate internal loads and distributed energy resources, including generation and storage devices, to address any operational, environmental, economic, or security constraints 24 Like the smart grid, a microgrid would improve energy efficiency and accelerate the integration of renewable energy sources. During normal operations, a microgrid acts no different than the smart grid. It increases energy efficiency by relying more heavily on non-continuous sources of power when they are available, such as wind and solar, and decreasing the use of generators or power from the civilian grid. Microgrids better manage energy use to avoid peak demand times when electricity is most expensive and can incorporate energy storage devices such as electric vehicles. If the microgrid detects a disruption in the civilian grid such as a blackout, the microgrid will isolate or “island” the facility from the main power grid. Once isolated, the microgrid will route power only to loads deemed critical, thus conserving fuel for the backup generators. If renewable energy options or battery backups are available, the microgrid will use energy from these sources to further conserve generator fuel. For example, if the civilian grid experiences a blackout during the day, a microgrid will draw power from solar photovoltaic arrays to run as many critical loads as possible, only turning on as many generators as are needed to meet the critical load demand.

Microgrid installation and capacity will grow 700 percent in the next few years---solves the case

Pike Research 9/16/11

Military Microgrid Capacity to Experience More than 700% Growth by 2017

http://www.pikeresearch.com/newsroom/military-microgrid-capacity-to-experience-more-than-700-growth-by-2017

The United States Department of Defense (DOD) is the single largest consumer of petroleum in the world. U.S. military operations are also the largest consumer of all forms of energy globally. Microgrids, which enable distributed energy generation at a localized scale including the ability to “island” themselves from larger utility grids, can shrink the amount of fossil fuels consumed to create electricity by networking generators as a system to maximize efficiency. Microgrids enable military bases – both stationary and tactical – to sustain operations no matter what is happening on the larger utility grid or in the theater of war. According to a new report from Pike Research, the capacity of military microgrids will grow at a rate of 739% between 2011 and 2017, increasing from 38 megawatts (MW) to 316 MW during that period, under a baseline forecast scenario. The cleantech market intelligence firm expects that, under a more aggressive adoption scenario, stationary and mobile military microgrid capacity could reach as high as 817 MW during the same timeframe. “The military’s primary concern is disruption of service from utility transmission and distribution lines,” says senior analyst Peter Asmus. “The lack of control and ownership of these lines – and the uneven quality of power service regionally throughout the United States – has prompted the DOD to reexamine the existing electricity service delivery model. This analysis has led the DOD to the inevitable conclusion that the best way to bolster its ability to secure power may well be through microgrid technology it can own and control.” Asmus adds that, as awareness about the electrical grid’s vulnerability to terrorist attacks has increased in recent times, the U.S. military has become one of the strongest proponents of microgrids, which offer the ultimate secure power supply for fixed base mobile operations. Many army, navy, air force, and other related bases and offices already have vintage microgrids in place. What is new, says Asmus, is that these facilities are looking to envelop entire bases with microgrids and integrate distributed energy generation on-site. These resources, when capable of safe islanding from the surrounding grid, offer the ultimate security since fuel never runs out with renewable energy resources such as solar or wind. The opportunity to help develop these microgrids has attracted a number of powerful technology companies including Lockheed Martin, GE, Honeywell, Boeing, and Eaton.

Empirical data supports Microgrids ability to meet military demands and be implemented quickly

Sater-Research Fellow at Global Green USA’s Security and Sustainability Office-11

Military Energy Security: Current Efforts and Future Solutions

http://globalgreen.org/docs/publication-185-1.pdf

Microgrids

A microgrid consists of physical and cyber elements. The physical system is the distribution

circuits, electronic devices, and electricity generators (either renewable or conventional) and the

cyber system is the software that acts as the “central decision support unit.”

45 Saifur Rahman and Manisa Pipattanasompornfrom from Virginia Tech, in partnership with the DOD’s Strategic Environmental Research and Development Program (SERDP), developed the five aforementioned tasks as well as a model called an Intelligent Distributed Autonomous Power Systems (IDAPS) microgrid. Their grid had the following characteristics: 1. Intelligence: The IDAPS microgrid knew which loads were critical and which loads it could shed during a commercial power outage. The grid made its decisions based upon a prioritized list of loads, the available internal power generation capability of the installation, and the expected duration of the outage. 2. Distribution: The grid connected various sources of power generation known as Distributed Energy Resources (DERs). By incorporating a range of generation sources the grid avoided the possibility of a single point failure being catastrophic to the mission assurance of the installation. 3. Autonomy: The grid could detect commercial power outages autonomously and island the installation without any human interaction, thus ensuring power to critical installation facilities. 4. Plug & Play and Scalability: An installation could add or remove DERs without any loss in function. This characteristic allows the installations to constantly update their renewable energy generation and add new sources of power without losing efficiency. Furthermore, the IDAPS microgrids are combinable. Installations could combine their microgrids to create “the building blocks for a more resilient regional electric power system.” 46

An important part of this research from Virginia Tech was the development of algorithms for the microgrid to estimate the electrical generation coming from typical renewable energy sources, including wind, solar, microturbines, and fuel cells. Some surprising evidence of the resiliency of electric grids controlled by microgrids comes from an unexpected place--Cuba. Cuba’s population of 11 million suffered 188 and 224 blackouts lasting more than one hour in 2004 and 2005, respectively. However, in 2007, the island suffered zero blackouts lasting more than one hour. In 2006, the Cuban government made a widespread, concerted effort to increase energy efficiency among its population and install microgrids with DERs across the country. In 2008, when two hurricanes in two weeks felled 167 transmission towers, the DERs and microgrids proved their resiliency. In the most damaged areas, microgrids islanded themselves and turned on portable diesel backup generators to maintain power to all critical services such as hospitals, food plants, and schools. The government is currently investing in renewable energy generation to replace its older diesel generators and make Cuba more energy independent. 47 Cuba’s experience provides two lessons for the US military. First, the resiliency shown by Cuba’s microgrids and DERs, despite severe damage from the hurricanes, lends itself to possible application in areas where the electric grid is always at risk such as Baghdad’s Sadr City. 48 Providing reliable electricity to a hazardous area could serve as a valuable counterinsurgency tool. However, this is a topic deserving of its own analysis and report and is too nuanced to discuss in depth here. The second lesson for the US military is the ability of a command structured organization, such as the Cuban Government or the US military, to enact significant reforms quickly and effectively when significant problems arise. According to the NREL, the structural hierarchy of the DOD gives it advantages in enacting radical change at speed and scale. The DOD has a history of adopting new technologies that later became important on the consumer market such as the Internet and GPS. 49 Evidence of the benefits of full scale integration of microgrids is available from the US as well. The residents and the public utility in Naperville, IL decided to invest in microgrid technology in the 1990s when their average duration of a blackout for a consumer, called the System Average Interruptible Duration Index (SAIDI), approached two hours. By 2010, the average duration was only 18 minutes. Likely the most important development was the construction of a real-time data acquisition system called System Control & Data Acquisition (SCADA). The so-called “smart grid brain” gathered and processed data and allowed the utility to anticipate demand spikes. Apart from the expected net benefit of $52 million the city expects over the next 15 years, the microgrid will eventually allow for lower prices per kilowatt hour of electricity as the utility better understands consumers’ needs and will serve as initial infrastructure for the integration of electric vehicles. 50

### Prolif

#### No risk of conventional conflict or backsliding into nuclear miscalculation from aggression – that’s Dratler prefer our analysis, cites empirics and every single instance where conventional conflict had a large propensity to occur.

#### Rogue states irrelevant – several tyrants have had nuclear weapons and nothing has happened – cooler heads prevail and prevent miscalculation.

#### The only thing that matters are empirical outcomes and the net body count

Sechser ‘9  (Todd, Assistant Prof. Politics – UVA and PhD Pol.. Sci. – Stanford, in “Controversies in Globalization: Contending Approaches to International Relations”, Ed. John A. Hird, Peter M. Haas and Beth McBratney, p. 171-172)

Second, the appropriate question is not whether the spread of nuclear weapons would result in any nuclear disasters, but whether a world with proliferation would on balance be more peaceful and more stable than a world without it**.** In other words, we must ask: will the gains outweigh the costs? Even if one of the terrible events feared by proliferation pessimists does occur at some point in the future (as indeed it may), this outcome will not necessarily imply that the costs of proliferation outweigh the benefits. If the spread of nuclear weapons also would prevent numerous conventional wars, **then** it may be entirely reasonable to conclude that the net overall benefit justifies a more relaxed nonproliferation policy. In deciding whether nuclear proliferation would be stabilizing or destabilizing for international politics, it is not enough to merely point out that risks exist—one must weigh those risks against potential rewards.

### 2NC A2: First use

#### No first use – even military leaders know that intelligence is problematic – makes first strike riskier than it’s worth – that’s Waltz

#### Prefer our evidence – Bzoteck cites broad empirical analysis and a scholarly consensus

#### Even if military leaders are in control its no risk, they are more rational than civilians

Waltz 95(Kenneth Waltz, The Spread of Nuclear Weapons: A Debate, 1995 p14-15

Fifth, in some of the new nuclear states, civil control of the military may be shaky. Nuclear weapons may fall into the hands of military officers more inclined than civilians are to put them to offensive use. This again is an old worry. I can see no reason to think that civil control of the military was secure in the Sovict Union, given thc occasional presence of military officers in the Politburo and some known and some surmised instances of military intervention in civil affairs at critical times." in the People's Republic of China, military and civil branches of government are not separated but fused. Although one may prefer civil control, preventing a highly destructive war does not require it. What is required is that decisions be made that keep destruction within bounds, whether decisions are made by civilians or soldiers. Soldiers may be more cautious than civilians. Generals and admirals do not like uncertainty, and they do not lack patriotism. They do not like to fight conventional wars under unfamiliar conditions. The offensive use or nuclear weapons multiplies uncertainties. Nobody knows what a nuclear battlefield would look like, and nobody knows what will happen after the first city is hit. Uncertainty about the course that a nuclear war might follow, along with the certainty that destruction can be immense, strongly inhibits the first use of nuclear weapons.

#### And if nukes are controlled by civilians there wouldn’t be preemption – political opinion

Bzostek 5 (Rachel, PhD Candidate Pol. Sci. “WHY NOT PREEMPT? AN ANALYSIS OF THE IMPACT OF LEGAL AND NORMATIVE CONSTRAINTS ON THE USE OF ANTICIPATORY MILITARY ACTIVITIES ”, August, <http://etd.lsu.edu/docs/available/etd-06302005-104805/unrestricted/Bzostek_dis.pdf>)

Van Evera, “**If this political penalty is small, a military first-strike advantage still provides a general first-strike advantage.” But, on the other hand, “a large political penalty can outweigh even a large military first-strike advantage, converting a military success into a general politicalmilitary failure.**” 143 The relative strength of each of these contrasting elements may be impacted by the intricacies and particularities of each crisis situation. However, due to the legal and normative uncertainties of anticipatory actions, allies of the would be preemptor/preventor may decide to withhold their support. Misperception can compound the difficulties inherent in deciding if a state should engage in anticipatory military activities. Betts notes that while launching a first-strike “may be the only way to avoid the consequences of being struck first in the near future”, in the real world, “it is rarely possible to be sure that the enemy preparations for war are definite, or are aggressively motivated, rather than precautionary reactions to rising tension and fear.” 144 Others examine if the regime type of a state impacts its propensity to use anticipatory military activities. Schweller argues that there are a variety of different factors that reduce the likelihood that democracies will use anticipatory military activities, and that these factors can help explain why different states respond to the same situations in different manners, i.e., why some states preempt while others do not. There are numerous attributes of democratic states that Schweller proposes predisposes these states away from using anticipatory military activities. For instance, Schweller extrapolates Kant’s position that “public opinion inhibits democratic state actors from initiating wars expected to be of great risk and cost” to apply to “preventive war, which by its nature is risky, since it is “an unprovoked war now to avoid the risks of war under worse circumstances later.” 145 Other characteristics of democratic states that influence the use or non-use of anticipatory military activities include the civilian control over the military (which serves to mitigate the “military’s institutional preference for offensive doctrine”), 146 the knowledge that the next election is just around the corner and that wars often come with a substantial political cost and therefore “democratic elites require something more than the assumption of a potential future threat based on the projection of an irreversible decline in relative power,” 147 and finally, there are the normative and “moral” constraints imposed by the “moral values of that society.” 148 Schweller does not argue that democracies never employ anticipatory military activities, but rather that they are severely constrained with respect to which crises and situations will be conducive to their use.

#### No preventative wars-people know they wont work

Seng 98 (Jordan, Phd Candidate in Pol. Sci. – U. Chicago, Dissertation, “STRATEGY for PANDORA'S CHILDREN: STABLE NUCLEAR PROLIFERATION AMONG MINOR STATES”, P. 158-159)

Analysts are right to focus on these special dangers of Third World scenarios, but they are wrong to focus on them exclusively. Pessimistic analysts often stress those things which would seem to enable and encourage adversaries to execute preventative strikes on nuclear assets without acknowledging factors that complicate and discourage such strikers. On balance, preventative strikes are likely to be prohibitively difficult and dangerous for Third World preventers. If they do occur, they are likely to be done in such a way that nuclear detonations will not be involved, and so collateral damage will be relatively limited. There are three reasons for these conclusions. One, by nature, preventative strikes against nuclear weapons programs are simply difficult to execute effectively, strategic distances being what they may. While it may be possible to destroy certain physical facilities associated with weapons development, it is extremely difficult to wipe-out the know-how behind them. Proliferators tend to be a determined lot, and though it may be possible to slow down their efforts to acquire the bomb, it is very hard to truly eliminate their nuclear weapons capacities. As a result, it is likely that preventive strikes will have to be repeated by adversaries and, for reasons we shall discuss, prevention is likely to be increasingly difficult with each successive round of preventative strikes. Two, preventive strikes against nuclear weapons programs are getting more difficult as time goes by. The recent diaspora of ex-Soviet nuclear scientists and the growing willingness of the Chinese to provide nuclear aid, and the general increase in nuclear trade and assistance has resulted in an “internationalization” of nuclear weapons knowledge. Even if preventers do manage to wipe-out a proliferator’s know-how with a preventative strike, the proliferator is increasingly able to purchase expertise on the international market. Also, proliferators and would-be proliferators increasingly are taking steps to ‘harden’ their nuclear assets against preventive strikes and they thereby further complicate prevention. Three, in any given situation of nuclear weapons development, the later it is in the proliferator’s weapons development program the greater the chance that the proliferator will have achieved some minimal nuclear weapons capability with which it can retaliate against preventers. That is, the closet proliferator is to achieving explosive capability, the greater the risk that it will be able to launch some limited nuclear retaliation. Because with Third World states even ‘limited’ retaliation with a handful of weapons can cause national devastation, this risk is especially severe for preventers in the Third World. Moreover, certain characteristics of Third World settings make it very difficult for would-be preventers to determine just how close to achieving weapons capability proliferators truly are. In such situations, preventive strikes are like rolls of the dice. These difficulties in determining proliferators’ location on the weapons development timeline, like the general difficulties in executing preventive strikes against nuclear assets, are likely to increase with each successive preventive strike the adversary is forced to make.

## 1nr

### Ext---timeframe

#### SMR’s are 12-14 years away from being online---that’s Anderson, here is more evidence, optimistic predictions are 2020

E&E 12 (“DOE funding for small reactors languishes as parties clash on debt” http://www.eenews.net/public/Greenwire/2012/09/24/3)

By phasing in six 100 MW "modules," each one a separate reactor, a company could lower costs to a more manageable $3 billion to $5.5 billion, Rosner and Goldberg wrote. They say the industry should drive down costs as more of the reactors are built, making them competitive with natural-gas-burning plants, provided that gas doesn't stay at today's low prices. The nuclear industry has set a goal of deploying the first small reactors by 2020 or 2022, and some utilities remain convinced that it is a promising way to go. Westinghouse has partnered with Ameren Corp., which would think about building one or more of Westinghouse's 225 MW reactors at its Callaway Energy Center in central Missouri.

#### Even when the tech is done construction will take decades

Daryan 1/3/12. ("Part 10 – Small modular reactors and mass production options” [http://daryanenergyblog.wordpress.com/ca/part-10-smallreactors-mass-prod/](http://daryanenergyblog.wordpress.com/ca/part-10-smallreactors-mass-prod/-http:/daryanenergyblog.wordpress.com/ca/part-10-smallreactors-mass-prod/))

So there are a host of practical factors in favour smaller reactors. But what’s the down side? Firstly, economies of scale. With a small reactor, we have all the excess baggage that comes with each power station, all the fixed costs and a much smaller pay-off. As I noted earlier, even thought many smaller reactors are a lot safer than large LWR’s (even a small LWR is somewhat safer!) you would still need to put them under a containment dome. It’s this process of concrete pouring that is often a bottle neck in nuclear reactor construction. We could get around the problem by clustering reactors together, i.e putting 2 or 4 reactors not only on the same site but under the same containment dome. The one downside here is that if one reactor has a problem, it will likely spread to its neighbours. How much of a showstopper this fact is depends on which type of reactors we are discussing. Also, in the shorter term small reactors would be slower to build, especially many of those we’ve been discussing, given that they are often made out of non-standard materials. Only a few facilities in the world could build them as the entire nuclear manufacturing industry is currently geared towards large LWR’s. Turning that juggernaut around would take decades. So by opting for small reactors while we’d get safer more flexible reactors, we be paying for it, as these reactors would be slower to build (initially anyway) and probably more expensive too.

This assumes government partnerships---at least 8 years until you get the first one

University of Chiacago Magazine 10/17/12 ( “A new generation” http://mag.uchicago.edu/science-medicine/new-generation)

*It will take time to get laborers up to speed*. The learning curve will make the early units expensive enough, Rosner says, that it may be difficult to find initial investors. “Most likely, it is the federal government that will have to be the first major buyer,” he says. Rosner’s optimistic estimate is that, if both the industry and the government push development, the first small modular reactors could become operational in eight to ten years. Realistically, he added, it could be well after 2020 before the first ones come online.

#### We can’t build plants fast – no manufacturing infrastructure in place

Madsen et al 9 (\*Travis, has worked with Frontier Group since 2002. His work has won coverage in a wide variety of local and national media outlets, including the Wall Street Journal, the New York Times, and the Los Angeles Times. He has helped to build the foundation for major policy advances, including the phaseout of toxic flame retardant chemicals from U.S. commerce and the expansion of renewable electricity standards across the nation. Prior to joining Frontier Group in 2002, Travis completed a fellowship at the New Jersey Public Interest Research Group, helping to win a campaign for tougher limits on automobile air pollution. Travis holds a bachelors degree in molecular biology and chemistry from the University of Colorado, and currently resides in Santa Barbara, California. \*Tony Dutzik, Tony Dutzik is senior policy analyst with Frontier Group. His research has focused on climate and energy policy, transportation, privatization of government services, and state-based approaches to public policy challenges. His reports have received national media attention - gaining coverage in the New York Times, the Wall Street Journal, the Philadelphia Inquirer and other major newspapers - and have helped lay the groundwork for reforms such as state adoption of enhanced emission standards for cars. Tony holds a Master's degree in print journalism from Boston University and a Bachelor of Science degree in public service from Penn State University, Bernadette Del Chiaro, directs Environment California’s Clean Energy Program and serves as the primary contact for energy issues, Del Chiaro holds a Bachelor of Science degree in Conservation and Resource Studies from the University of California at Berkeley. Rob Sargent, He is currently the Energy Program Director for Environment America and oversees policy and strategy development for energy and global warming campaigns throughout the U.S and in our nation’s capitol. He has been involved as a policy advisor and strategist in numerous successful campaigns to promote state Renewable Energy Standards; the adoption of the California Clean Cars programs in the states; energy efficiency measures and in shaping state and regional commitments to reducing global warming emissions. He is a 1982 graduate of the University of Vermont. “Generating Failure How Building Nuclear Power Plants Would Set America Back in the Race Against Global Warming” <http://www.environmentamerica.org/sites/environment/files/reports/Generating-Failure---Environment-America---Web_0.pdf>)

The American nuclear industry is not ready to move quickly. No American power company has ordered a new nuclear power plant since 1978, and all reactors ordered after the fall of 1973 ended up cancelled. As a result, domestic manufacturing capability for nuclear reactor parts has withered and trained personnel are scarce.

#### And delays and cost overruns prevent fast development – empirics prove

Madsen et al 9 (\*Travis, has worked with Frontier Group since 2002. His work has won coverage in a wide variety of local and national media outlets, including the Wall Street Journal, the New York Times, and the Los Angeles Times. He has helped to build the foundation for major policy advances, including the phaseout of toxic flame retardant chemicals from U.S. commerce and the expansion of renewable electricity standards across the nation. Prior to joining Frontier Group in 2002, Travis completed a fellowship at the New Jersey Public Interest Research Group, helping to win a campaign for tougher limits on automobile air pollution. Travis holds a bachelors degree in molecular biology and chemistry from the University of Colorado, and currently resides in Santa Barbara, California. \*Tony Dutzik, Tony Dutzik is senior policy analyst with Frontier Group. His research has focused on climate and energy policy, transportation, privatization of government services, and state-based approaches to public policy challenges. His reports have received national media attention - gaining coverage in the New York Times, the Wall Street Journal, the Philadelphia Inquirer and other major newspapers - and have helped lay the groundwork for reforms such as state adoption of enhanced emission standards for cars. Tony holds a Master's degree in print journalism from Boston University and a Bachelor of Science degree in public service from Penn State University, Bernadette Del Chiaro, directs Environment California’s Clean Energy Program and serves as the primary contact for energy issues, Del Chiaro holds a Bachelor of Science degree in Conservation and Resource Studies from the University of California at Berkeley. Rob Sargent, He is currently the Energy Program Director for Environment America and oversees policy and strategy development for energy and global warming campaigns throughout the U.S and in our nation’s capitol. He has been involved as a policy advisor and strategist in numerous successful campaigns to promote state Renewable Energy Standards; the adoption of the California Clean Cars programs in the states; energy efficiency measures and in shaping state and regional commitments to reducing global warming emissions. He is a 1982 graduate of the University of Vermont. “Generating Failure How Building Nuclear Power Plants Would Set America Back in the Race Against Global Warming” <http://www.environmentamerica.org/sites/environment/files/reports/Generating-Failure---Environment-America---Web_0.pdf>)

However, it is likely that no new nuclear reactors could be online until 2018 or later. During the last wave of nuclear construction in the United States, the average reactor took nine years to build. New reactors are likely to experience similar delays. For example, a new reactor now under construction in Finland is at least three years behind schedule after a series of quality control failures.

### Impact d

#### Kagan’s arguments are logically flawed and unproven.

Preble 2012

Christopher Preble, vice president for defense and foreign-policy studies at the Cato Institute, The Critique of Pure Kagan, The National Interest July/August 2012, http://nationalinterest.org/bookreview/the-critique-pure-kagan-7061?page=1

Kagan’s too-casual rejection of any reasonable alternative to American hegemony reveals the crucial flaw in his reasoning, however, given that he predicts we might not be afforded a choice in the future. If the United States can’t sustain its current posture indefinitely, a wiser long-term grand strategy would set about—preferably now—easing the difficult and sometimes dangerous transitions that often characterize major power shifts. Rather than continuing to discourage other countries from tending to their security affairs, the United States should welcome such behavior. Kagan’s reassuring tone—about China’s unique vulnerabilities, for example—actually buttresses that competing point of view. After all, if a distant, distracted hegemon like the United States can manage the challenge posed by China, and if it can do so while preventing wars and unrest in several other regions simultaneously, then Asian nations would be at least equally capable of accomplishing the same task given that they will be focused solely on their own security primarily in just that one region. KAGAN REFUSES to consider this possibility. He writes that the “most important features of today’s world—the great spread of democracy, the prosperity, the prolonged great-power peace—have depended directly and indirectly on power and influence exercised by the United States.” It follows, therefore, that the world would become considerably less democratic, less prosperous and less peaceful if the United States were to withdraw militarily from Europe, Asia and the Middle East. Of course, he can’t actually prove either claim to be true, and he concedes as much. Instead, he bases his case on a particular set of beliefs about how the world works and about the United States’ unique characteristics within that system. Kagan asserts that the world requires a single, order-inducing hegemon to enforce the rules of the game and that America must perform this role because its global economic interests demand it. He also believes that the United States has a special obligation, deriving from its heritage as a “dangerous nation,” to spread democracy and human rights. What’s more, America’s military might is the essential ingredient that leads to its international influence. The spread of democracy and market capitalism, Kagan claims, is made possible by U.S. power but would retreat before autocracy and mercantilism if that power were seen to be waning. The attractiveness of America’s culture, economics and political system—the vaunted “soft power” in Joseph Nye’s telling—is fleeting and would dissipate if Americans were to commit what Kagan calls “preemptive superpower suicide.” How other nations respond to U.S. power also follows a familiar pattern. In Kagan’s telling, allies will bandwagon with us if we are committed to defending them but bolt like frightened racehorses at the first sign of trouble. Would-be challengers will back down in the face of U.S. power but rush to exploit opportunities for conquest if Uncle Sam exhibits any hesitation or self-doubt. And Kagan simply dismisses any suggestion that other countries might chafe at American dominance or fear American power. His ideas represent something close to the reigning orthodoxy in Washington today and for the past two decades. Inside the Beltway, there is broad, bipartisan agreement on the basic parameters of U.S. foreign policy that Kagan spells out. This consensus contends that the burden of proof is on those who argue against the status quo. The United States and the world have enjoyed an unprecedented stretch of security and prosperity; it would be the height of folly, the foreign-policy establishment asserts, to upend the current structure on the assumption that an alternative approach would represent any improvement. But such arguments combine the most elementary of post hoc fallacies with unwarranted assumptions and idle speculation. Correlation does not prove causation. There are many factors that could explain the relative peace of the past half century. Kagan surveys them all—including economic interdependence, evolving norms governing the use of force and the existence of nuclear weapons—and concludes that U.S. power is the only decisive one. But, once again, he concedes that he cannot prove it.

#### Nations will not bandwagon with the US

Kupchan 12

Charles A., Senior fellow at CFR and Professor of International Affairs at Georgetown, Second Mates, National Journal, 3-16-2012, http://www.nationaljournal.com/magazine/is-american-primacy-really-diminishing—20120315

But Washington simply can’t expect emerging powers other than China to line up on its side. History suggests that a more equal distribution of power will produce fluid alignments, not fixed alliances. During the late 19th century, for example, the onset of a multi­polar Europe produced a continually shifting network of pacts. Large and small powers alike jockeyed for advantage in an uncertain environment. Only after imperial Germany’s military buildup threatened to overturn the equilibrium did Europe’s nations group into the competing alliances that ultimately faced off in World War I. As the 21st century unfolds, China is more likely than other emerging nations to threaten U.S. interests. But unless or until the rest of the world is forced to choose sides, most developing countries will keep their options open, not obediently follow America’s lead. Already, rising powers are showing that they’ll chart their own courses. Turkey for decades oriented its statecraft westward, focusing almost exclusively on its ties to the United States and Europe. Now, Ankara looks primarily east and south, seeking to extend its sway throughout the Middle East. Its secular bent has given way to Islamist leanings; its traditionally close connection with Israel is on the rocks; and its relations with Washington, although steadier of late, have never recovered from the rift over the U.S. invasion of Iraq in 2003. India is supposedly America’s newest strategic partner. Relations have certainly improved since the 2005 agreement on civilian nuclear cooperation, and the two nations see eye to eye on checking China’s regional intentions. But on many other fronts, Washington and New Delhi are miles apart. India frets, for instance, that the U.S. will give Pakistan too much sway in Afghanistan. On the most pressing national security issue of the day—Iran’s nuclear program—India is more of a hindrance than a help, defying Washington’s effort to isolate Iran through tighter economic sanctions. And the two democracies have long been at loggerheads over trade and market access. Nations such as Turkey and India, which Kagan argues will be either geopolitically irrelevant or solid American supporters, are already pushing back against Washington. And they are doing so while the United States still wields a pronounced preponderance of power. Imagine how things will look when the playing field has truly leveled out.

#### ---Statistical data disproves the necessity of hegemony\*\*\*

Fettweis 2011

Christopher J. Fettweis, Department of Political Science, Tulane University, 9/26/11, Free Riding or Restraint? Examining European Grand Strategy, Comparative Strategy, 30:316–332, EBSCO

It is perhaps worth noting that there is no evidence to support a direct relationship between the relative level of U.S. activism and international stability. In fact, the limited data we do have suggest the opposite may be true. During the 1990s, the United States cut back on its defense spending fairly substantially. By 1998, the United States was spending $100 billion less on defense in real terms than it had in 1990.51 To internationalists, defense hawks and believers in hegemonic stability, this irresponsible “peace dividend” endangered both national and global security. “No serious analyst of American military capabilities,” argued Kristol and Kagan, “doubts that the defense budget has been cut much too far to meet America’s responsibilities to itself and to world peace.”52 On the other hand, if the pacific trends were not based upon U.S. hegemony but a strengthening norm against interstate war, one would not have expected an increase in global instability and violence. The verdict from the past two decades is fairly plain: The world grew more peaceful while the United States cut its forces. No state seemed to believe that its security was endangered by a less-capable United States military, or at least none took any action that would suggest such a belief. No militaries were enhanced to address power vacuums, no security dilemmas drove insecurity or arms races, and no regional balancing occurred once the stabilizing presence of the U.S. military was diminished. The rest of the world acted as if the threat of international war was not a pressing concern, despite the reduction in U.S. capabilities. Most of all, the United States and its allies were no less safe. The incidence and magnitude of global conflict declined while the United States cut its military spending under President Clinton, and kept declining as the Bush Administration ramped the spending back up. No complex statistical analysis should be necessary to reach the conclusion that the two are unrelated. Military spending figures by themselves are insufficient to disprove a connection between overall U.S. actions and international stability. Once again, one could presumably argue that spending is not the only or even the best indication of hegemony, and that it is instead U.S. foreign political and security commitments that maintain stability. Since neither was significantly altered during this period, instability should not have been expected. Alternately, advocates of hegemonic stability could believe that relative rather than absolute spending is decisive in bringing peace. Although the United States cut back on its spending during the 1990s, its relative advantage never wavered. However, even if it is true that either U.S. commitments or relative spending account for global pacific trends, then at the very least stability can evidently be maintained at drastically lower levels of both. In other words, even if one can be allowed to argue in the alternative for a moment and suppose that there is in fact a level of engagement below which the United States cannot drop without increasing international disorder, a rational grand strategist would still recommend cutting back on engagement and spending until that level is determined. Grand strategic decisions are never final; continual adjustments can and must be made as time goes on. Basic logic suggests that the United States ought to spend the minimum amount of its blood and treasure while seeking the maximum return on its investment. And if the current era of stability is as stable as many believe it to be, no increase in conflict would ever occur irrespective of U.S. spending, which would save untold trillions for an increasingly debt-ridden nation. It is also perhaps worth noting that if opposite trends had unfolded, if other states had reacted to news of cuts in U.S. defense spending with more aggressive or insecure behavior, then internationalists would surely argue that their expectations had been fulfilled. If increases in conflict would have been interpreted as proof of the wisdom of internationalist strategies, then logical consistency demands that the lack thereof should at least pose a problem. As it stands, the only evidence we have regarding the likely systemic reaction to a more restrained United States suggests that the current peaceful trends are unrelated to U.S. military spending. Evidently the rest of the world can operate quite effectively without the presence of a global policeman. Those who think otherwise base their view on faith alone.

#### ---Empirical data concludes hegemony doesn’t prevent war.

Mearsheimer 2011

John J., R. Wendell Harrison Distinguished Service Professor of Political Science at the University of Chicago, The National Interest, Imperial by Design, lexis

One year later, Charles Krauthammer emphasized in "The Unipolar Moment" that the United States had emerged from the Cold War as by far the most powerful country on the planet.2 He urged American leaders not to be reticent about using that power "to lead a unipolar world, unashamedly laying down the rules of world order and being prepared to enforce them." Krauthammer's advice fit neatly with Fukuyama's vision of the future: the United States should take the lead in bringing democracy to less developed countries the world over. After all, that shouldn't be an especially difficult task given that America had awesome power and the cunning of history on its side. U.S. grand strategy has followed this basic prescription for the past twenty years, mainly because most policy makers inside the Beltway have agreed with the thrust of Fukuyama's and Krauthammer's early analyses. The results, however, have been disastrous. The United States has been at war for a startling two out of every three years since 1989, and there is no end in sight. As anyone with a rudimentary knowledge of world events knows, countries that continuously fight wars invariably build powerful national-security bureaucracies that undermine civil liberties and make it difficult to hold leaders accountable for their behavior; and they invariably end up adopting ruthless policies normally associated with brutal dictators. The Founding Fathers understood this problem, as is clear from James Madison's observation that "no nation can preserve its freedom in the midst of continual warfare." Washington's pursuit of policies like assassination, rendition and torture over the past decade, not to mention the weakening of the rule of law at home, shows that their fears were justified. To make matters worse, the United States is now engaged in protracted wars in Afghanistan and Iraq that have so far cost well over a trillion dollars and resulted in around forty-seven thousand American casualties. The pain and suffering inflicted on Iraq has been enormous. Since the war began in March 2003, more than one hundred thousand Iraqi civilians have been killed, roughly 2 million Iraqis have left the country and 1.7 million more have been internally displaced. Moreover, the American military is not going to win either one of these conflicts, despite all the phony talk about how the "surge" has worked in Iraq and how a similar strategy can produce another miracle in Afghanistan. We may well be stuck in both quagmires for years to come, in fruitless pursuit of victory. The United States has also been unable to solve three other major foreign-policy problems. Washington has worked overtime-with no success-to shut down Iran's uranium-enrichment capability for fear that it might lead to Tehran acquiring nuclear weapons. And the United States, unable to prevent North Korea from acquiring nuclear weapons in the first place, now seems incapable of compelling Pyongyang to give them up. Finally, every post-Cold War administration has tried and failed to settle the Israeli-Palestinian conflict; all indicators are that this problem will deteriorate further as the West Bank and Gaza are incorporated into a Greater Israel. The unpleasant truth is that the United States is in a world of trouble today on the foreign-policy front, and this state of affairs is only likely to get worse in the next few years, as Afghanistan and Iraq unravel and the blame game escalates to poisonous levels. Thus, it is hardly surprising that a recent Chicago Council on Global Affairs survey found that "looking forward 50 years, only 33 percent of Americans think the United States will continue to be the world's leading power." Clearly, the heady days of the early 1990s have given way to a pronounced pessimism.

### 2nc/1nr---disad outweighs

**We control impact escalation---space weapons make accidental wars more likely by increasing use them or lose them pressures---you can talk down intentional wars not accidents, that increases probability---MAD and interdepence solve their conflicts**

**Weeden 8** (Brian Weeden is a consultant with the Secure World Foundation developing the technical feasibility and architecture for Space Trafﬁc Management. “How China “Wins” a Space War” <http://www.chinasecurity.us/index.php?option=com_content&view=article&id=86&Itemid=8> //Donnie)

In the end, a space war can be “won” only in a purely tactical sense. At a strategic and global level these tactical gains are hugely offset by the long term degradation of the space environment, perhaps even leading to the complete denial of the use of space by any party. The consequences of conflict in space can also be illustrated through another military scenario – nuclear warfare. Parallels can be drawn between the thousands of nuclear intercontinental ballistic missiles poised on a hair trigger alert and the deployment of fully developed counterspace capabilities by paranoid nations. The most serious of these parallels is the potential for escalation and heightened tension leading to undesired actions. And while it can be argued that nuclear weapons actually prevented large-scale conventional war, they did so at an enormous economic cost and they created many side effects that will continue to cause problems long into the future. This Cold War analogy only goes so far since the current international relations environment is fundamentally different than anything seen since World War II. There is no longer a simple zero-sum situation with two great powers espousing two opposite philosophies backed by massive conventional and nuclear armies. The modern world is a highly dynamic one where nations are interlinked through complex economic ties and where the main prize is international soft power and influence rather than physical territory. Thus, this system inherently already has a form of economic deterrence damping major military action among major powers**. There is no need to develop a “space deterrence” similar to nuclear deterrence that was used in the Cold War.** Hopefully, we can learn from our history and avoid making the same mistakes in the **emerging domain of space.** As stated at the end of the movie “War Games,”“the only winning move is not to play the game.” Space wafare and weaponization is a game that no nation can afford to play.

**And---first use pressures mean they cause preemptive strikes on both sides**

**Hitchens 4** (*Theresa Hitchens* has had a long career in journalism, with a focus on military, defense industry and NATO affairs. leads CDI’s Space Security Project in cooperation with the Secure World Foundation. The author of “Future Security In Space: Charting a Cooperative Course,” she also continues to write on space and nuclear arms control issues for a number of outside publications. She 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. “U.S. Weaponization of Space: Plans and Implications” <http://www.cdi.org/program/issue/document.cfm?DocumentID=3191&IssueID=76&StartRow=11&ListRows=10&appendURL=&Orderby=DateLastUpdated&ProgramID=68&issueID=76>)

The negative consequences of a global space arms race are hard to exaggerate. Space-based weapons, like any other object on orbit, are inherently vulnerable to attack and best exploited as first-strike weapons. And because of the high-value (and high cost) of such weapon systems, commanders **are likely to view them as “use them or lose them” assets** – piquing itchy trigger fingers that could lead to rapid escalation of any crises. Indeed, any conflict involving ASAT use is likely to lead to rapid escalation of hostilities, in particular amongst **nuclear states**. The objective of an attacker would be to eliminate the other side’s capabilities to respond either in kind or on the ground by taking out satellites providing warning, surveillance, communications and targeting, leaving the other side blind, deaf and mute. At that point, the response is very likely to be nuclear, as the U.S. Air Force found out in conducting space war games. Aviation Week and Space Technology quoted one recent gamer as saying “[If] I don’t know what’s going on, I have no choice but to hit everything, using everything I have.

**It leads to space debris which turns the aff**

**Hitchens 4** (*Theresa Hitchens* has had a long career in journalism, with a focus on military, defense industry and NATO affairs. leads CDI’s Space Security Project in cooperation with the Secure World Foundation. The author of “Future Security In Space: Charting a Cooperative Course,” she also continues to write on space and nuclear arms control issues for a number of outside publications. She 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. “U.S. Weaponization of Space: Plans and Implications” <http://www.cdi.org/program/issue/document.cfm?DocumentID=3191&IssueID=76&StartRow=11&ListRows=10&appendURL=&Orderby=DateLastUpdated&ProgramID=68&issueID=76>)

Another negative consequence of a space arms race would be a dramatic increase in dangerous space debris. Space is already polluted with orbiting junk, as every single space launch results in debris – even if launch providers follow the very best-known practices in mitigation. Space debris is hazardous to spacecraft and satellites because of the very high speeds at which objects orbit the Earth, leading to very high impact velocities in any collision. Thus, even tiny pieces of debris – such as bolts or even paint flecks – can damage or destroy a satellite or spacecraft such as the International Space Station. Indeed, the ISS already is moved several times a year to avoid potential debris impacts. Obviously, the testing or use of kinetic energy ASATs – whether ground-based or space-based – would result in new debris. And the debris created from an all-out space war would obviously be significant. Unfortunately, such debris does not discriminate between combatants and non-combatants. It would put at risk commercially owned satellites, national civil satellites owned by neutral countries and multinational spacecraft as well as the military space systems of the two opponents. Remembering that the global value of satellites and satellite services is huge and growing, it is also conceivable that the advent of space weapons programs (particularly those based on kinetic energy concepts) could have a negative market impact even before the first weapon system is deployed. Most commercial systems are not seriously hardened against simple jamming, much less given protections such as extra fuel for maneuvering out of the way of wayward ASATs or space debris. Thus, commercial providers might find their own costs rising as it becomes necessary to implement protections – remembering that most militaries primarily rely on commercial communications providers, making these satellites potentially “soft,” more easily damaged targets in war time. Further, already exorbitant insurance rates may well skyrocket if insurers were to feel that commercial assets might be more vulnerable to debris or possible preemptive strike. Rising costs would, in turn, make it more difficult for those nations who stand the most to gain from easier, cheaper access to space – the developing world – to continue to reap the benefits space provides for economic and public development.

### 2nc cautious norming

**Obama is proposing a code of conduct which is becoming a spring board for international cooperation, that increased china and Russia relations, that’s Krepon, prefer our evidence because its most recent**

**Here is more, PRIOR consultation NOW over space policy**

**Lister 1/16/12** (Michael, is a space law attorney with a focus on counseling organizations on issues relating to domestic and international space law and policy and provides consultations on the same. Michael is a contributor to several publications, including Space Safety Magazine and a Senior Contributor to DefensePolicy.Org “US rebuffs current draft of EU Code of Conduct: is there something waiting in the wings?” <http://thespacereview.com/article/2006/1>)

If the Obama Administration is not going to continue with the current draft of the Code, is there an alternative that it has in mind? A comment by in the wake of Tauscher’s comment made by another government official may help to answer that question. According to the unidentified government official, the draft Code is not being rejected outright and **it could serve as starting point for future discussions on an international code of conduct.** These comments suggest that **the administration may already have an alternative to the Code in mind.** Insiders may have also corroborated Tauscher’s statement in that the administration may soon be publically announcing a series of talking points, which could serve as the foundation of a campaign leading to a US-led international code of conduct. If the US is indeed seeking to spearhead its own code of conduct, it will likely face the same challenges and criticisms that the EU effort faced in addition to a potentially hostile EU, who may be reluctant to participate after having its effort effectively commandeered. It is also likely that nations such as China and Russia will remain steadfast against any attempts to institute an international code of conduct given their preference to address outer space security matters through legally-binding arms control measures such as the PPWT, which both nations have co-sponsored in UN Conference of Disarmament. A more important issue is whether a US-led effort would be inclusive and seek the input of other nations such as India in crafting an international code so as to address specific geographic and cultural interests, or whether the U.S. will unilaterally craft a code or otherwise only invite the major space-faring nations in an effort to curry their support for the measure. However, Nuland’s statements suggests that **the US may reach out to countries, such as India, to ensure that their geopolitical security interests are also represented.** The question remains whether those countries would be open to engaging in, or otherwise trust direct negotiations with, the US. There is also the question of how spearheading an international code of conduct will dovetail into the current approach towards space security laid out in the current US space policy. The United States will be participating in the Group of Government Experts on Outer Space in 2012 to present its plan to use redefined and repurposed transparency and confidence-building measures (TCBMs) in lieu of legally-binding treaties to address outer space security issues.5 Selling the idea to the international community is not going to be an easy task, taking into account that China and Russia have made it clear they do not support the US approach. Both of these nations have collaborated in generating a soft-power din in the UN over the issue of outer space security in general and space weapons in particular, which the US may find hard to overcome. If the US does pursue an international code, it could be intended to supplement the current US approach. However, an international code effort by the United States might also be intended to supplant the administration’s plans to present TCBMs to the Group of Government Experts, thereby bypassing the UN and, as a result, the soft-power advantage **that China and Russia wield there**. If this is the case, doing so would still be consistent with US space policy since the Code or a successor would still technically be considered a TCBM. The only difference in such an approach is that the US would engage other nations outside the UN, thus eliminating **the factor of UN politics**. The question remains if the administration never intended to sign on to the Code why did it wait so long and go through the diplomatic effort to review the EU Code? One explanation is that the U.S. played along with the EU effort to see how the Code would be received by space-faring and non-space-faring nations alike possibly as a litmus test for its own space policy’s foray into repurposing transparency and confidence-building measures. This effectively would allow the U.S. to keep its political and diplomatic powder dry while the EU expended their own political and diplomatic capital on the draft Code. The U.S. could then gauge the potential response to its own approach and decide whether it would be prudent to continue along its current path or pursue a different course of action.

### ext---cause miscalc

Nuclear posture shift: the plan puts everyone on high alert

First,

the US would have to target all enemy ground forces for the weapons to be effective, this gets misperceived triggering escalation and causes a hair trigger nuclear posture.

Krepon 4 — Michael Krepon, Co-Founder, Senior Associate, and Director of the South Asia and Space Security programs at the Henry L. Stimson Center—a nonproﬁt, nonpartisan institution devoted to enhancing international peace and security through a unique combination of rigorous analysis and outreach, previously worked at the Carnegie Endowment for International Peace and the US Arms Control and Disarmament Agency, has authored or edited thirteen books and over 350 articles, holds an M.A. from the School of Advanced International Studies at Johns Hopkins University and a B.A. from Franklin & Marshall College, 2004 (“Weapons in the Heavens: A Radical and Reckless Option ,” *Arms Control Today*, November, Available Online at http://www.armscontrol.org/act/2004\_11/Krepon, Accessed 07-16-2011)

To prevent adversaries from shooting back, the United States would need to know exactly where all threatening space objects are located, to neutralize them without producing debris that can damage U.S. or allied space objects, and to target and defeat all ground-based military activities that could join the fight in space. In other words, successful space warfare mandates pre-emptive strikes and a preventive war in space as well as on the ground. War plans and execution often go awry here on Earth. It takes enormous hubris to believe that space warfare would be any different. If ASAT and space-based, ground-attack weapons are flight-tested and deployed, space warriors will have succeeded in the dubious achievement of replicating the hair-trigger nuclear postures that plagued humankind during the Cold War. Armageddon nuclear postures continue to this day, with thousands of U.S. and Russian nuclear weapons ready to be launched in minutes to incinerate opposing forces, command and control nodes, and other targets, some of which happen to be located within large metropolitan areas. If the heavens were weaponized, these nuclear postures would be reinforced and elevated into space. U.S. space warriors now have a doctrine and plans for counterspace operations, but they do not have a credible plan to stop inadvertent or uncontrolled escalation once the shooting starts. Like U.S. war-fighting scenarios, there is a huge chasm between plans and consequences, in which requirements for escalation dominance make uncontrolled escalation far more likely. A pre-emptive strike in space on a nation that possesses nuclear weapons would invite the gravest possible consequences. Attacks on satellites that provide early warning and other critical military support functions would most likely be viewed either as a surrogate or as a prelude to attacks on nuclear forces.

**Reduced response time**

**Baljac 8** (Marko Beljac, a Foreign Policy In Focus contributor, teaches at the University of Melbourne. “Arms Race in Space” <http://www.fpif.org/articles/arms_race_in_space> //Donnie)

Space Weaponization The United States has been quietly working on implementing this vision. Space weaponization is a relatively long-term project that is expected to culminate by 2030. But the pace seems to be quickening. The Pentagon has produced a series of doctrinal documents that clarify what is meant by war in space and how it is to be properly waged. Hitherto, the program has emphasized improving situational awareness in space. It’s impossible to wage war in space without knowing precisely who has what where. However, in the 2008 budget, Congress appropriated $7 million dollars for “offensive counterspace” operations out of a $53 million dollar budget for “counterpace operations” which actually amounts to an increase in the level of funding sort by the White House. That suggests that the United States is moving up a gear on space weaponization and that this has both congressional and White House support which is critical for long-term strategic planning. In fact we have just learnt that the Air Force is working on plans to develop a “counter-ASAT” space weapon system by 2011. Reports suggest that most aspects of these plans are secret but some information has emerged in the public domain that sheds some interesting light on US space weapons planning. The system is known as the Rapid Attack Identification Detection Reporting System (Raidrs) Block 20. The rationale for this program is to develop information in a timely fashion to enable the Pentagon to intercept a direct-ascent anti-satellite weapon, which are launched from the Earth, before it strikes its target in low earth orbit. But if the asset used to achieve this objective is space based then this may well enable BMD hawks to also obtain a space based BMD interception capability and there is no reason to suppose that a “counter-ASAT” weapon could not also function as an offensive space weapon. Nascent Asian Space Race As noted, China has tested an anti satellite weapon and Russia has stated that it would not allow other states to control space and threaten its own space assets. In Asia a nascent space race seems to be developing between China, Japan and India. In the far future the large deposits of Helium-3 on the moon's surface could lead to a militarized race to colonize the moon to secure Helium-3 for nuclear fusion energy technologies based on anuetronic fusion reactions in the context of depleting hydro-carbons. Washington argues that it has too much commercially riding on space to allow others to have the potential capability of disrupting U.S. space assets. In 1998 the failure of one satellite, the Galaxy IV, made some 80% of pagers in the U.S. malfunction. Though the latest Russian and Chinese space arms control proposal is flawed, because of the clumsy definition of what constitutes a “space weapon,” this doesn’t mean that space arms control is not possible in principle. A global space arms control regime would protect U.S., Russian, Chinese, and even **Australian space assets**. An arms race in space will eventually lead other states to catch up with the United States and thereby placing Washington's commercial satellites at risk. Space weaponization may well have cataclysmic consequences given the link between space weapons and nuclear weapons strategy. This is because Russia, and the United States, to a certain extent rely on satellites for early warning of nuclear attack. As other space nations with nuclear weapons develop their space capacity it is expected that they will follow suit. The deployment of space weapons means that the first shot in a nuclear war would be fired against these early warning satellites. Currently strategic planners in Moscow have about 10 minutes between warning of an attack and the decision to launch nuclear weapons in response before they impact. Weapons in space would lower this in certain scenarios down to seconds. This would also apply for weapons placed in space that would be considered to be defensive such as say a space based BMD interceptor or a “counter-ASAT” weapon. On occasion, ground warning radars falsely show that a nuclear attack has been launched. In the 1990s a false alarm went all the way up to President Boris Yeltsin and was terminated after approximately eight minutes. We are still here, noted analysts believe, because warning satellites would have given Moscow real time information showing the alarm to be false. Should such a false alarm coincide with an accident involving an early warning satellite when space weapons are known to exist, an accidental nuclear exchange could result. The risk would increase if the false alarm occurred during a crisis. **Space weapons could lead to itchy fingers on nuclear triggers**. They would therefore **significantly increase** the importance nuclear weapon states place upon nuclear deterrence.

**Debris: one piece of rock or any other minor incident will get misinterpreted as the prelude to attack, causes immediate escalation**

Lewis 4 — Jeffrey Lewis, postdoctoral fellow in the Advanced Methods of Cooperative Security Program at the Center for International and Security Studies at the University of Maryland School of Public Policy, previously worked in the Office of the Undersecretary of Defense for Policy, 2004 (“What if Space Were Weaponized? Possible Consequences for Crisis Scenarios,” Center for Defense Information, Available Online at http://www.cdi.org/PDFs/scenarios.pdf, Accessed 07-16-2011)

The prospect that space weapons might render the United States invulnerable to any kind of attack will remain tempting. And, **for the foreseeable future, it will remain out of reach, for myriad reasons**. Many warn that space weapons will be technologically daunting and cost-prohibitive, while alienating nations allied to the United States and antagonizing others. These ﬁve scenarios attempt to explain a different, complicated idea: **In a world with space weapons, the U**nited **S**tates **may be better armed, but we may well be less secure**. • Scenario 1 argues that U.S. anti-satellite (ASAT) programs are likely to inspire and aid the ASAT programs of others. In a world where many states have ASATs, the United States, which is heavily dependent on space systems, has the most to lose. • Scenario 2 argues that the tremendous value provided by space-based military systems is also very vulnerable to attack, creating perverse incentives for a U.S. president to rapidly escalate conﬂict in a crisis situation. • Scenario 3 argues that Russia and China are likely to change their nuclear postures in response to expanding U.S. military capabilities in outer space, increasing the readiness of their forces at the expense of operational control, and undermining years of efforts at risk reduction. • Scenario 4 argues that the space-enabled war-ﬁghting strategies tangle nuclear and space forces together in a way that creates unnecessary risks of accident – such as **a piece of space debris striking a Russian early-warning satellite** that **could be interpreted as an attack.** • Scenario 5 considers the possibility of conﬂicts that escalate into space, threatening American space assets through collateral damage, even if the United States is a third party.

There is low threshold for this link, in the world of the plan one mistake means extinction.

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This is the second of two scenarios that consider how U.S. space weapons might create incentives for America’s opponents to behave in dangerous ways. The previous scenario looked at the systemic risk of accidents that could arise from keeping nuclear weapons on high alert to guard against a space weapons attack. This section focuses on the risk that **a single accident in space**, such as a piece of space debris striking a Russian early-warning satellite, **might be the catalyst for an accidental nuclear war**. As we have noted in an earlier section, the United States canceled its own ASAT program in the 1980s over concerns that the deployment of these weapons might be deeply destabilizing. For all the talk about a “new relationship” between the United States and Russia, both sides retain thousands of nuclear forces on alert and conﬁgured to ﬁght a nuclear war. When briefed about the size and status of U.S. nuclear forces, President George W. Bush reportedly asked “What do we need all these weapons for?” 43 The answer, as it was during the Cold War, is that the forces remain on alert to conduct a number of possible contingencies, including a nuclear strike against Russia. This fact, of course, is not lost on the Russian leadership, which has been increasing its reliance on nuclear weapons to compensate for the country’s declining military might. In the mid-1990s, Russia dropped its pledge to refrain from the “ﬁrst use” of nuclear weapons and conducted a series of exercises in which Russian nuclear forces prepared to use nuclear weapons to repel a NATO invasion. In October 2003, Russian Defense Minister Sergei Ivanov reiterated that Moscow might use nuclear weapons “preemptively” in any number of contingencies, including a NATO attack. 44

### 2nc at: key to heg

**Countries will just shift**

**Hardesty** Captain David C. is is a member of the faculty of theNaval War College’s Strategy and Policy Department **’05** (Naval War College Review, “Space-Based Weapons: Long-Term Strategic Implications and Alternatives”, Spring 2005)

THE ARGUMENT S FOR SPACE-BAS ING WEAPONS Basing weapons in orbit, then, will not be in the long-term interests of the United States. Still, there are those who disagree. The two most commonly heard arguments that full weaponization of space would be beneficial for the United States are that it is inevitable, and that space is a “center of gravity” that the nation must weaponize in order to protect. A third argument less frequently heard is that moving first to weaponize space would achieve complete dominance in that domain and thus permanently secure U.S. national interests through a benevolent hegemony. U.S. Space Hegemony Everett Dolman argues that the downsides of space-basing weapons can be avoided by using current and near-term capabilities “to . . . seize military control of low-Earth orbit. From that high ground vantage . . . space-based laser or kinetic energy weapons could prevent any other state from deploying assets there, and could most effectively engage and destroy terrestrial enemy ASAT facilities.” 28 Other states would be allowed to compete commercially in space with the United States, but only after notification and approval of each launch. Underlying this view and the arguments adduced in its support is the idea that by seizing space the United States will have seized a vantage point from which the earth itself can be dominated. This is the “ultimate high ground” argument, which, as we have seen, has serious weaknesses; it is not at all clear that even in strictly military terms dominance in space means dominance on earth. In fact, its benefits are likely to be both marginal and temporary if an enemy shifts the terms of the engagement. The more important questions would be the political and legal. The preemptive destruction of another nation’s space-based weapon would be a direct violation of the 1967 Outer Space Treaty, which states that outer space “shall be free for exploration and use by all States without discrimination of any kind.” 29 If U.S. deployment of space-based weapons is a peaceful use of space under the treaty, deployment by another state is protected as well. This is not in itself a problem for space hegemonists, who advocate “withdrawing from the current space regime” and announcing “a principle of free-market sovereignty in space.” 30 However, potential foes are not in the least likely to accept unilateral American assertion of space dominance, negating as it would many countries’ deterrence strategies and implying permanent and irreversible asymmetric U.S. advantage in space. In the absence of a direct threat to their existence, such as existed during the Cold War, it is unlikely that allies would accept it either. Both would probably, as the United States does now, view “purposeful interference with space systems” as “an infringement on sovereign rights.” 31 Heavy political and economic costs would likely be imposed on the United States, which is unlikely to find the political will to uphold such a dramatic change in policy against both friends and enemies. A more limited approach, denying “rogue states” access to space, could also be proposed. This could be construed as in accordance with the current National Security Strategy objective to “prevent our enemies from threatening us, our allies, and our friends with weapons of mass destruction,” since it is difficult to verify that there are no weapons of mass destruction on orbital space weapons platforms, and even conventional space-based ordnance could attack such facilities as nuclear power sites and so produce WMD-like effects. 32 This concept might be accepted internationally, or imposed unilaterally with acceptable political cost, against a state like North Korea, with a history of attacking its neighbors, clear links to terrorist acts, a record of violating treaties, and an authoritarian regime. Even this example poses problems, however. Debris from a boost-phase EAGLE engagement of a missile launched from North Korea would presumably not hit the United States, but other nations in the region might be struck. It is not hard to envision the outcry should debris rain on Japan, China, or Russia from a booster that North Korea claimed had been merely placing a communications satellite into orbit. Other rogue state space “lockout” issues are even more problematic. Iran is frequently quoted as a potential future threat to the United States, but it seems almost certain that a space “lockout” against a country that has not attacked its neighbors in recent history and has functioning democratic institutions would cause a severe international backlash. Additionally, any deployment of space-based weapons against a “rogue state” is likely to elicit space-based weapons deployments by third parties. China is likely to be one of the first countries to follow suit. The destabilizing aspects of space-based weapons would be particularly unhelpful in any future crisis over Taiwan. Thus, a decision to space-base weapons should not be made under the illusion that it will result in unilateral U.S. advantage. Some limited “lockout” from space of a rogue state may be possible under certain circumstances, but the space-basing of weapons in response by other states that could become enemies must be considered.

#### IF the war would happen with SQ heg more deterrence with space weapons wouldn’t work anyway

**Elhefnawy 3** (Elhefnawy, Nader. "Four Myths About Space Power." Parameters. (Spring 2003): 124-32, Donnie)

A common feature of scenarios built around the "omniscient, unobstructed lethality" of an "astrocop" system is that it will stop any tank, plane, or missile from crossing borders, effectively ending interstate war. Unfortunately, such a plan assumes a billiard-ball model of international relations in which states are unitary, self-contained actors, an idea which appears increasingly quaint. (The proponents of such a system, after all, often claim that interstate war is largely a thing of the past, which raises the problem that this enormous investment is being justified through reference to a problem that is supposed to have already disappeared.) Most of the conventional conflicts where such weapons may be effective are civil wars which spill across borders, involving neighboring states. A better question than "How will the United States manage interstate wars?" may be "How will the United States manage intrastate wars?" and few have had much to say on that score. The reality is that as in the Cold War, internal and interstate conflicts are likely to feed off each other. American control of space will not in and of itself prevent antagonisms between states from finding their expression in proxy wars. At the same time, internal conflicts can complicate American relations with other great powers because these do have geopolitical significance, and because they often occur along ethnic lines. If Samuel Huntington's "clash of civilizations" thesis was an overstatement, it was nonetheless a factor in Russian hostility toward NATO action in the former Yugoslavia during the 1990s.

**Deterrence breakdown is inevitable—mutual vulnerability prevents space wars from occurring in the first place**

**Kreapon 10** (“An International Code of Conduct for Responsible Space-Faring Nations” <http://www.stimson.org/images/uploads/research-pdfs/An_International_Code_of_Conduct_for_Responsible_Space-Faring_Nations.pdf> //Donnie)

Deterrence is by no means assured; it could break down by conscious choice or by accidents, uncontrolled events, or inadvertence. Nonetheless, the history of the space age to date suggests that warfare in space between major powers is by no means inevitable. Prior restraint may be due, in part, to the ability of major space-faring nations to respond with latent ASAT capabilities and other hedges to damage each other’s satellites. Mutual vulnerability in space could serve, in part, to **keep future warfare in space from occurring.**

**Space wars indiscriminacy makes it unlikely in the status quo, contries don’t want to risk space debris hitting their assets, it will harm them economically and strategically, as long as we are all equally vulnerable there will not be a space war because countries don’t have the incentive to start it ONLY the plan changes that calculation by grasping for deterrence**

**Krepon 8** (Michael Krepon is co-founder of Stimson, and director of the South Asia and Space Security programs Co-Founder/Senior Associate. “Preserving Freedom of Action in Space: Realizing the Potential and Limits of U.S. Spacepower” <http://www.ndu.edu/press/lib/pdf/spacepower/space-Ch20.pdf> //Donnie)

If essential but vulnerable satellites cannot be effectively defended by space weapons, their protection rests largely on deterrence. When offense is too lethal to use because its net effect would be to harm vital national assets and interests, the default option for freedom of action in space is to accept mutual vulnerability. Nuclear deterrence had many detractors during the Cold War, even though it helped prevent nuclear exchanges between well-armed foes. The more power a nation possesses, the harder it is to accept vulnerability. But the benefits of hard and soft spacepower inescapably depend on satellites that are far easier to attack than to defend. Asymmetric capabilities and vulnerabilities in space do not negate the precepts of deterrence or the essence of mutual vulnerability. During the Cold War, for example, Beijing faced not one but two hostile superpowers and yet chose to maintain nuclear forces that were significantly inferior to those of the United States and the Soviet Union. Presumably, China's leadership concluded that relatively few mushroom clouds were needed to clarify superpower vulnerability. We argue, by analogy, that asymmetries related to dependence on space and capabilities in space do not alter the fundamentals of vulnerability and deterrence. The country with the most to lose from attacks on satellites, the United States, also has the most capabilities to respond with lethal force, which would be more indiscriminate because of the impairment or loss of its satellites. We have argued elsewhere that space warfare and its effects are unlikely to be country-specific. Because space warfare can be more indiscriminate than terrestrial warfare, and because all space-faring nations are increasingly dependent on space assets for national and economic security, all major powers face the same fundamental dilemma that satellites are both essential and extraordinarily vulnerable, and that the use of weapons in space is likely to have unintended, negative consequences. Mechanical objects may be the initial victims of space warfare, but satellites are unlikely to be the only victims, since they are directly linked to soldiers, noncombatants, and nuclear weapons. Nuclear deterrence was based on the repeated testing of nuclear weapons and their means of delivery, as well as on the deployment of many dedicated weapons systems in a high state of launch readiness. If we were to adopt such practices for dedicated ASAT or space-to-Earth weapons, satellite security would be greatly diminished, and relations among major powers, along with international space cooperation, would deteriorate. At best, a very uneasy standoff in space could result from the flight-testing and deployment of dedicated ASAT weapons. In our view, no further ASAT testing is required because, for all practical purposes, this uneasy standoff already exists. Major spacefaring nations have already clarified their ability to disrupt or destroy satellites. Since these capabilities are well understood, they do not need to be demonstrated by further testing, the net effect of which would be more worrisome than reassuring. **Mutual assured destruction in space** is therefore far easier to maintain than nuclear deterrence was during the Cold War, because mutual vulnerability from the use of weapons in or from space does not require repeated demonstrations of the weapons in question. And unlike nuclear deterrence, which had the practical effect of limiting freedom of action, acceptance of mutual vulnerability in space would maximize freedom of action and access. Despite these significant differences, there are two principal connecting threads between the acceptance of mutual vulnerability between major nuclear powers and major space powers. First, attacks on satellites in crises between major powers risk the use of nuclear weapons. And second, existential vulnerability to nuclear and satellite attacks is not solvable by military means.

**Space weapons collapse primacy before they solve---**

**a.) Trust**

#### Spacey 98 [Major William L. Spacy II (BS, United States Air Force Academy; MS, Air Force Institute of Technology; MA, United States College of Naval Command and Staff. “Does The United States Need Space-Based Weapons? By William L. Spacy Ii A Thesis Presented To The Faculty Of The School Of Advanced Airpower Studies For Completion Of Graduation Requirements.”]

Today, the United States is in the enviable position of being the only superpower to survive the Cold War. Many models of political interaction would predict that a nation with so much power would prompt other nations to form alliances against it.158 The fact that this has not happened is arguably a result of past U.S. restraint in exercising power. For instance, during the Cold War the United States allowed the other North Atlantic Treaty Organization members much more say in the structure of the organization and its decision-making processes than was necessary given their dependence on the U.S. nuclear umbrella.159 This reluctance to aggressively use military power to further U.S. interests has prompted other nations to trust that the United States will not abuse its military superiority. A unilateral move to put weapons in space could undermine this trust.

**b.) Counterbalancing**

**Hitchens 10** [Hitchens, Theresa. Director, Center for Defense Information, Leader of Space Security Project in cooperation with the Secure World Foundation. The author of “Future Security In Space: Charting a Cooperative Course,” Cited by Center for Nonproliferation Studies Mountbatten Centre for “International Studies Future Security in Space: Commercial, Military, and Arms Control Trade-Offs Occasional”]

Dr. Karl Mueller, a former Air Force analyst now at RAND, writes:. 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.2 On the other hand, a space race cannot be ruled out as a likely outcome—especially given that many countries with much fewer economic and technical resources than the United States are already going to space**.** A strategic-level space race could have negative consequences for U.S. security in the long run that could outweigh any short-term advantage of being the first with space-based weapons. In particular, it would be costly in dollar terms to sustain orbital weapon systems and stay ahead of opponents intent on matching U.S. space-weapon capabilities. The price tag of space-weapon systems and protective measures would not be trivial for anyone choosing to pursue them— with maintenance costs a key issue.

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The other related negative side effect of the inherent vulnerability of orbiting weapons is the pressure to use them first. The strategic dynamic of space-based weapons could perhaps be compared to that of nuclear intercontinental 30 ballistic missiles— offense-dominant weapons with inherent vulnerabilities (fixed sites). This is a recipe for instability, as the United States and Soviet Union soon found in their nuclear competition. Spurring other nations to acquire spacebased weapons, either ASATs or weapons aimed at terrestrial targets, would undercut the ability of U.S. forces to operate freely on the ground on a global basis and thus negate what today is a unique advantage of being the world’s only military superpower.3 Along with military assets in space, U.S. commercial satellites would also become targets (especially because the U.S. military is heavily reliant on commercial providers, particularly in communications). In other words, the United States could be in the position of creating strategic and military problems for itself, rather than solving them

**d.)** **Defense spending**

**Kaufman et. al 3** (Richard F. Kaufman was formerly General Counsel of the Joint Economic Committee of the US Congress where he directed and wrote numerous studies of national security and the economy, defense production, and international economics. He is presently Director of the Bethesda Research Institute and is a Vice Chair of Economists Allied for Arms Reduction. He was the project director as well as a co-author of the present report. “THE FULL COSTS of BALLISTIC MISSILE DEFENSE” <http://www.epsusa.org/publications/papers/bmd/bmd.pdf> //Donnie)

If the military budget were not increased to cover spending on BMD, then BMD would displace nearly 6% of other defense spending by 2005 and more than 12% from 2007 through 2011 before tapering down gradually as a share of defense spending. **It would continue to take more than $50 billion each year** (in 2003 dollars) through 2015 (although a declining percentage of a growing defense budget) and between $25 billion and $35 billion per year through 2022 before reaching a long-term operating budget of about $22 billion per year. **This would come at the expense of other military technology development, procurement and operations.** If spending rises more slowly at first, and deployment dates are pushed back, then spending would not decline after 2015 but would **continue rising steeply**, as deployment of ground, sea and air-based systems coincides with high spending on production and deployment of space based BMD systems. Military transformation is underway, with new organizational forms, new technologies, new equipment and new roles for individuals. Most transformation goals will require substantial budgetary resources for research into new technologies, extensive re-training, and reequipping. The schedule for missile defense spending planned for the next several years will inevitably compete with and divert resources needed for the broader goals of **military transformation.**

Space hegemonists are wrong: Military dominance in space doesn’t reinforce hegemony and leads to backlash

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**d.)** **Defense spending**

**Kaufman et. al 3** (Richard F. Kaufman was formerly General Counsel of the Joint Economic Committee of the US Congress where he directed and wrote numerous studies of national security and the economy, defense production, and international economics. He is presently Director of the Bethesda Research Institute and is a Vice Chair of Economists Allied for Arms Reduction. He was the project director as well as a co-author of the present report. “THE FULL COSTS of BALLISTIC MISSILE DEFENSE” <http://www.epsusa.org/publications/papers/bmd/bmd.pdf> //Donnie)

If the military budget were not increased to cover spending on BMD, then BMD would displace nearly 6% of other defense spending by 2005 and more than 12% from 2007 through 2011 before tapering down gradually as a share of defense spending. **It would continue to take more than $50 billion each year** (in 2003 dollars) through 2015 (although a declining percentage of a growing defense budget) and between $25 billion and $35 billion per year through 2022 before reaching a long-term operating budget of about $22 billion per year. **This would come at the expense of other military technology development, procurement and operations.** If spending rises more slowly at first, and deployment dates are pushed back, then spending would not decline after 2015 but would **continue rising steeply**, as deployment of ground, sea and air-based systems coincides with high spending on production and deployment of space based BMD systems. Military transformation is underway, with new organizational forms, new technologies, new equipment and new roles for individuals. Most transformation goals will require substantial budgetary resources for research into new technologies, extensive re-training, and reequipping. The schedule for missile defense spending planned for the next several years will inevitably compete with and divert resources needed for the broader goals of **military transformation.**

Space hegemonists are wrong: Military dominance in space doesn’t reinforce hegemony and leads to backlash

**Hardesty** Captain David C. is is a member of the faculty of theNaval War College’s Strategy and Policy Department **’05** (Naval War College Review, “Space-Based Weapons: Long-Term Strategic Implications and Alternatives”, Spring 2005)

THE ARGUMENT S FOR SPACE-BAS ING WEAPONS Basing weapons in orbit, then, will not be in the long-term interests of the United States. Still, there are those who disagree. The two most commonly heard arguments that full weaponization of space would be beneficial for the United States are that it is inevitable, and that space is a “center of gravity” that the nation must weaponize in order to protect. A third argument less frequently heard is that moving first to weaponize space would achieve complete dominance in that domain and thus permanently secure U.S. national interests through a benevolent hegemony. U.S. Space Hegemony Everett Dolman argues that the downsides of space-basing weapons can be avoided by using current and near-term capabilities “to . . . seize military control of low-Earth orbit. From that high ground vantage . . . space-based laser or kinetic energy weapons could prevent any other state from deploying assets there, and could most effectively engage and destroy terrestrial enemy ASAT facilities.” 28 Other states would be allowed to compete commercially in space with the United States, but only after notification and approval of each launch. Underlying this view and the arguments adduced in its support is the idea that by seizing space the United States will have seized a vantage point from which the earth itself can be dominated. This is the “ultimate high ground” argument, which, as we have seen, has serious weaknesses; it is not at all clear that even in strictly military terms dominance in space means dominance on earth. In fact, its benefits are likely to be both marginal and temporary if an enemy shifts the terms of the engagement. The more important questions would be the political and legal. The preemptive destruction of another nation’s space-based weapon would be a direct violation of the 1967 Outer Space Treaty, which states that outer space “shall be free for exploration and use by all States without discrimination of any kind.” 29 If U.S. deployment of space-based weapons is a peaceful use of space under the treaty, deployment by another state is protected as well. This is not in itself a problem for space hegemonists, who advocate “withdrawing from the current space regime” and announcing “a principle of free-market sovereignty in space.” 30 However, potential foes are not in the least likely to accept unilateral American assertion of space dominance, negating as it would many countries’ deterrence strategies and implying permanent and irreversible asymmetric U.S. advantage in space. In the absence of a direct threat to their existence, such as existed during the Cold War, it is unlikely that allies would accept it either. Both would probably, as the United States does now, view “purposeful interference with space systems” as “an infringement on sovereign rights.” 31 Heavy political and economic costs would likely be imposed on the United States, which is unlikely to find the political will to uphold such a dramatic change in policy against both friends and enemies. A more limited approach, denying “rogue states” access to space, could also be proposed. This could be construed as in accordance with the current National Security Strategy objective to “prevent our enemies from threatening us, our allies, and our friends with weapons of mass destruction,” since it is difficult to verify that there are no weapons of mass destruction on orbital space weapons platforms, and even conventional space-based ordnance could attack such facilities as nuclear power sites and so produce WMD-like effects. 32 This concept might be accepted internationally, or imposed unilaterally with acceptable political cost, against a state like North Korea, with a history of attacking its neighbors, clear links to terrorist acts, a record of violating treaties, and an authoritarian regime. Even this example poses problems, however. Debris from a boost-phase EAGLE engagement of a missile launched from North Korea would presumably not hit the United States, but other nations in the region might be struck. It is not hard to envision the outcry should debris rain on Japan, China, or Russia from a booster that North Korea claimed had been merely placing a communications satellite into orbit. Other rogue state space “lockout” issues are even more problematic. Iran is frequently quoted as a potential future threat to the United States, but it seems almost certain that a space “lockout” against a country that has not attacked its neighbors in recent history and has functioning democratic institutions would cause a severe international backlash. Additionally, any deployment of space-based weapons against a “rogue state” is likely to elicit space-based weapons deployments by third parties. China is likely to be one of the first countries to follow suit. The destabilizing aspects of space-based weapons would be particularly unhelpful in any future crisis over Taiwan. Thus, a decision to space-base weapons should not be made under the illusion that it will result in unilateral U.S. advantage. Some limited “lockout” from space of a rogue state may be possible under certain circumstances, but the space-basing of weapons in response by other states that could become enemies must be considered.

technology

the Uranium Committee of the Energy Minerals Division 9 (“The Role of Nuclear Power in Space Exploration and the Associated Environmental Issues: An Overview” http://www.aapg.org/committees/astrogeology/EMDCampbell060909925AM.pdf)

In late 1953, President Dwight D. Eisenhower proposed in his famous ―Atoms-for-Peace‖ address that the United Nations establish an international agency that would promote the peaceful uses of nuclear energy (Engler, 1987). Since the time of Sputnik in 1957, artificial satellites have provided communications, digital traffic and satellite photography, and the means for the development of cell phones, television, radio and other uses. Of necessity, they require their own power source (Aftergood, 1989). For many satellites this has been provided by solar panels, where electricity is generated by the photovoltaic effect of sunlight on certain substrates, notably silicon and germanium. However, because the intensity of sunlight varies inversely with the square of the distance from the sun, a probe sent off to Jupiter, Saturn, and beyond would only receive a few per cent of the sunlight it would receive were it in Earth orbit. In that case, solar panels would have to be so large that employing them would be impractical (Rosen and Schnyer, especially page 157, 1989). A space exploration mission requires power at many stages, such as the initial launch of the space vehicle and subsequent maneuvering, to run the instrumentation and communication systems, warming or cooling of vital systems, lighting, various experiments, and many more uses, especially in manned missions. To date, chemical rocket thrusters have been used exclusively for launching spacecraft into orbit and beyond. It would be tempting to believe that all power after launch could be supplied by solar energy. However, in many cases, missions will take place in areas too far from sufficient sunlight, areas where large solar panels will not be appropriate. Limitations of solar power have logically lead to the development of alternative sources of power and heating. One alternative involves the use of nuclear power systems (NPSs). These rely on the use of radioisotopes and are generally referred to as radioisotope thermoelectric generators (RTGs), thermoelectric generators (TEGs), and radioisotope heater units (RHUs). These units have been employed on both U.S. and Soviet/Russian spacecrafts for more than 40 years. Space exploration would not have been possible without the use of RTGs to provide electrical power and to maintain the temperatures of various components within their operational ranges (Bennett, 2006). RTGs evolved out of a simple experiment in physics. In 1812, a German scientist (named T. J. Seebeck) discovered that when two dissimilar wires are connected at two junctions, and if one junction is kept hot while the other is cold, an electric current will flow in the circuit between them from hot to cold. Such a pair of junctions is called a thermoelectric couple. The required heat can be supplied by one of a number of radioactive isotopes. The device that converts heat to electricity has no moving parts and is, therefore, very reliable and continues for as long as the radioisotope source produces a useful level of heat. The heat production is, of course, continually decaying but radioisotopes are customized to fit the intended use of the electricity and for the planned mission duration. The IAEA report (2005a) suggests that nuclear reactors can provide almost limitless power for almost any duration. However, they are not practicable for applications below 10 kW. RTGs are best used for continuous supply of low levels (up to 5 kW) of power or in combinations up to many times this value. For this reason, especially for long interplanetary missions, the use of radioisotopes for communications and the powering of experiments are preferred. For short durations of up to a few hours, chemical fuels can provide energy of up to 60,000 kW, but for mission durations of a month use is limited to a kilowatt or less. Although solar power is an advanced form of nuclear power, this source of energy diffuses with distance from the Sun and does not provide the often needed rapid surges of large amounts of energy.

### 2nc link

#### Power beaming with SMRs vital to long-term space control---independently leads to nuclear powered satellites

Downey, 4

(Lt. Col.-USAF, April, “Flying Reactors: The Political Feasibility of Nuclear Power in Space,” http://www.dtic.mil/dtic/tr/fulltext/u2/a425874.pdf)

The report also emphasizes the necessity for superior United States space based intelligence, surveillance and reconnaissance (ISR), and for space control. While **missions** envisioned under these drivers do not absolutely need SNP, any simple analysis demonstrates that they **would benefit by using nuclear power** because of its intrinsic advantages. Direct costs would fall, and mission effectiveness would **be enhanced by a small**, light, compact, long lived **system that provided** both ample **electrical power** and thrust for on-orbit maneuver. If DOD enters the SNP business, though, a major shift will occur. Instead of the few, rare SNP system launches that NASA would execute primarily for deep space missions, DOD missions would necessitate that SNP operations become commonplace. It is easy to envision constellations of nuclear powered satellites in orbit. One candidate system would be advanced space based radar, or perhaps a system with a mix of active and passive hyper-spectral sensors. Regular SNP operations in low earth orbit would add a new dimension to the public’s perception of risk. They would also require a different imperative to establish an effective public engagement process about the political feasibility of SNP before there is a need to increase the number of operational SNP platforms. In addition, SNP systems in orbit around the Earth will certainly be of concern to numerous international stakeholders.

Those risk extinction and turn the case

Grossman 11 (Karl Grossman, professor of journalism at the State University of New York/College of New York, is the author of the book, The Wrong Stuff: The Space's Program's Nuclear Threat to Our Planet (Common Courage Press) and wrote and presented the TV program Nukes In Space: The Nuclearization and Weaponization of the Heavens (<http://www.envirovideo.com>). “What Could Truly End the Space Program: A Nuclear Disaster Overhead” <http://www.opednews.com/articles/What-Could-Truly-End-the-S-by-Karl-Grossman-110721-80.html> //Donnie)

What is NASA's future now that Atlantis has landed and the shuttle program is over? If NASA persists in using nuclear power in space, the agency's future is threatened. Between November 25 and December 15 NASA plans to launch for use on Mars a rover fueled with 10.6 pounds of plutonium, more plutonium than ever used on a rover. The mission has a huge cost: $2.5 billion. But if there is an accident before the rover is well on its way to Mars, and plutonium is released on Earth, its cost stands to be yet more gargantuan. NASA's Final Environmental Impact Statement for what it calls its Mars Science Laboratory Mission says that if plutonium is released on Earth, the cost could be as high as $1.5 billion to decontaminate each square mile of "mixed-use urban areas" impacted. What"s the probability of an accident releasing plutonium? The NASA document says "the probability of an accident with a release of plutonium" is 1-in-220 "overall." If you knew your chance of not surviving an airplane flight--or just a drive in a car--was 1 in 220, would you take that trip? And is this enormous risk necessary? In two weeks, there'll be a NASA mission demonstrating a clear alternative to atomic energy in space: solar power. On August 5, NASA plans to launch a solar-powered space probe it's named Juno to Jupiter. There's no atomic energy involved, although NASA for decades has insisted that nuclear power is necessary for space devices beyond the orbit of Mars. With Juno, NASA will be showing it had that wrong. "Juno will provide answers to critical science questions about Jupiter, as well as key information that will dramatically enhance present theories about the early formation of our own solar system," says NASA on its website. "In 2016, the spinning, solar-powered Juno spacecraft will reach Jupiter." It will be equipped with "instruments that can sense the hidden world beneath Jupiter's colorful clouds" and make 33 passes of Jupiter. As notes Aviation Week and Space Technology: "The unique spacecraft will set a record by running on solar power rather than nuclear radioisotope thermoelectric generators previously used to operate spacecraft that far from the Sun." The Mars rover to be launched, named Curiosity by NASA, will be equipped with these radioisotope thermoelectric generators using plutonium, the deadliest radioactive substance. Juno, a large craft--66-feet wide--will be powered by solar panels built by a Boeing subsidiary, Spectrolab. The panels can convert 28 percent of the sunlight that them to electricity. They'll also produce heat to keep Juno's instruments warm. This mission's cost is $1.1 billion. In fact, Juno is not a wholly unique spacecraft. In 2004, the European Space Agency launched a space probe called Rosetta that is also solar-powered. Its mission is to orbit and land on a comet--beyond the orbit of Jupiter. Moreover, there have been major developments in "solar sails" to propel spacecraft. Last year, the Japan Aerospace Exploration Agency launched its Ikaros spacecraft with solar sails taking it to Venus. In January, NASA itself launched its NanoSail-D spacecraft. The Planetary Society has been developing several spacecraft that will take advantage of photons emitted by the Sun to travel through the vacuum of space. At no point will Juno (or the other solar spacecrafts) be a threat to life on Earth. This includes Juno posing no danger when in 2013 it makes a flyby of Earth. Such flybys making use of Earth's gravity to increase a spacecraft's velocity have constituted dangerous maneuvers when in recent years they've involved plutonium-powered space probes such as NASA's Galileo and Cassini probes. Curiosity is a return to nuclear danger. NASA's Final Environmental Impact statement admits that a large swath of Earth could be impacted by plutonium in an accident involving it. The document's section on "Impacts of Radiological Releases" says "the affected environment" could include "the regional area near the Cape Canaveral Air Force Station and the global area." "Launch area accidents would initially release material into the regional area, defined"to be within "62 miles of the launch pad," says the document. This is an area from Cape Canaveral west to Orlando. But "since some of the accidents result in the release of very fine particles less than a micron in diameter, a portion of such releases could be transported beyond"62 miles," it goes on. These particles could become "well-mixed in the troposphere"--the atmosphere five to nine miles high--"and have been assumed to potentially affect persons living within a latitude band from approximately 23-degrees north to 30-degrees north." That's a swath through the Caribbean, across North Africa and the Mideast, then India and China Hawaii and other Pacific islands, and Mexico and southern Texas. Then, as the rocket carrying Curiosity up gains altitude, the impacts of an accident in which plutonium is released would be even broader. The plutonium could affect people "anywhere between 28-degrees north and 28-degrees south latitude," says the NASA document. That's a band around the mid-section of the Earth including much of South America, Africa and Australia. Dr. Helen Caldicott, president emeritus of Physicians for Social Responsibility, has long emphasized that a pound of plutonium if uniformly distributed could hypothetically give a fatal dose of lung cancer to every person on Earth. A pound, even 10.6 pounds, could never be that uniformly distributed, of course. But an accident in which plutonium is released by a space device as tiny particles falling to Earth maximizes its lethality. A millionth of a gram of plutonium can be a fatal dose. The pathway of greatest concern is the breathing in plutonium particle.. As the NASA Environmental Impact Statement puts it: "Particles smaller than about 5 microns would be transported to and remain in the trachea, bronchi, or deep lung regions." The plutonium particles "would continuously irradiate lung tissue." "A small fraction would be transported over time directly to the blood or to lymph nodes and then to the blood," it continues. Once plutonium "has entered the blood via ingestion or inhalation, it would circulate and be deposited primarily in the liver and skeletal system." Also, says the document, some of the plutonium would migrate to the testes or ovaries. The cost of decontamination of areas affected by the plutonium could be, according to the NASA statement, $267 million for each square mile of farmland, $478 million for each square mile of forests and $1.5 billion for each square mile of "mixed-use urban areas." The NASA document lists "secondary social costs associated with the decontamination and mitigation activities" as: "Temporary or longer term relocation of residents; temporary or longer term loss of employment; destruction or quarantine of agricultural products including citrus crops; land use restrictions which could affect real estate values, tourism and recreational activities; restriction or bands on commercial fishing; and public health effects and medical care." As to why the use of a plutonium-powered rover on Mars--considering that NASA has successfully used solar-powered rovers on Mars--the NASA Environmental Impact Statement says that a "solar-powered rover"would not be capable of operating over the full range of scientifically desirable landing site latitudes" on this mission. There's more to it. For many decades there has been a marriage of nuclear power and space at NASA. The use of nuclear power on space missions has been heavily promoted by the U.S. Department of Energy and its predecessor agency, the U.S. Atomic Energy Commission, and the many DOE (previously AEC) national laboratories including Los Alamos and Oak Ridge. This provides work for these government entities. Also, the manufacturers of nuclear-powered space devices--General Electric was a pioneer in this--have pushed their products. Further, NASA has sought to coordinate its activities with the U.S. military. The military for decades has planned for the deployment of nuclear-powered weapons in space. Personifying the NASA-military connection now is NASA Administrator Charles Bolden, a former NASA astronaut and Marine Corps major general. Appointed by President Barack Obama, he is a booster of radioisotope thermoelectric generators as well as rockets using nuclear power for propulsion. The U.S. has spent billions of dollars through the years on such rockets but none have ever taken off and the programs have all ended up cancelled largely out of concern about a nuclear-powered rocket blowing up on launch or falling back to Earth. Accidents have happened in the U.S. space nuclear program. Of the 26 space missions that have used plutonium which are listed in the NASA Environmental Impact Statement for the Mars Science Laboratory Mission, three underwent accident, admits the document. The worst occurred in 1964 and involved, it notes, the SNAP-9A plutonium system aboard a satellite that failed to achieve orbit and dropped to Earth, disintegrating as it fell. The 2.1 pounds of plutonium fuel dispersed widely over the Earth and Dr. John Gofman, professor of medical physics at the University of California at Berkeley, long linked this accident to an increase in global lung cancer. With the SNAP-9A accident, NASA switched to solar energy on satellites. Now all satellites--and the International Space Station--are solar-powered. There was a near-miss involving a nuclear disaster and a space shuttle. The ill-fated Challenger's next mission in 1986 was to loft a plutonium-powered space probe. The NASA Environmental Impact Statement includes comments from people and organizations some highly critical of a plutonium-powered Mars Science Laboratory Mission. Leah Karpen of Asheville, North Carolina says: "Every expansion of plutonium research, development and transportation of this deadly material increases the risk of nuclear accident or theft. In addition, plutonium production is expensive and diverts resources from the more important social needs of our society today, and in the future." She urges NASA "to reconsider the use of nuclear" and go with solar instead. Jeremy Maxand, executive director of the Idaho-based Snake River Alliance, calls on NASA and the Department of Energy to "take this opportunity to move space exploration in a sustainable direction with regard to power. Using solar rather than nuclear to power the Mars Science Laboratory Mission would keep the U.S. safe, advance energy technologies that are cleaner and more secure, be more fiscally responsible, and set a responsible example to other countries as they make decisions about their energy future." Ace Hoffman of Carlsbad, California speaks of "today's nuclear NASA" and a "closed society of dangerous, closed-minded "scientists' who are hoodwinking the American public and who are guilty of premeditated random murder." He adds: "The media has a duty to learn the truth rather than parrot NASA's blanketly-false assertions." NASA, in response to the criticisms, repeatedly states in the document: "NASA and the DOE take very seriously the possibility that an action they take could potentially result in harm to humans or the environment. Therefore, both agencies maintain vigorous processes to reduce the potential for such events." Involved in challenging the mission is the Global Network Against Weapons & Nuclear Power in Space (www.space4peace.org). Bruce Gagnon, coordinator of the Maine-based organization, says that " NASA sadly appears committed to maintaining their dangerous alliance with the nuclear industry. Both entities view space as a new market for the deadly plutonium fuel." Says Gagnon: "The taxpayers are being asked once again to pay for nuclear missions that could endanger the life of all the people on the planet "Have we not learned anything from Chernobyl and Fukushima? We don't need to be launching nukes into space. It's not a gamble we can afford to take." With the return of Atlantis and end of the shuttle program, there are concerns about this being the "end" of the U.S. space program. An accident if NASA continues to insist on mixing atomic energy and space--a nuclear disaster overhead--that, indeed, could end the space program.

#### Only small modular reactors will make the DOD capable of deploying space lasers---the political will exists, it is only a question of having the technology to pull it off

David 12 (Leonard David has been reporting on the space industry for more than five decades. He is a winner of last year's National Space Club Press Award and a past editor-in-chief of the National Space Society's Ad Astra and Space World magazines. He has written for SPACE.com since 1999. “Air Force Eyes Nuclear Reactors, Beamed Power for Spacecraft” http://www.space.com/14643-air-force-space-nuclear-reactors-power-beaming.html)

The U.S. Air Force has laid out a new vision for its energy science and technology needs over the next 15 years – a forecast that includes plans for space-based power stations and the prospective use of small nuclear reactors for new spacecraft. The report, entitled "Energy Horizons: United States Air Force Energy S&T Vision 2011-2026," focuses on core Air Force missions in space, air, cyberspace and infrastructure. A series of Air Force mission-focused workshops and summits were held to shape the new strategy. The report was released Feb. 9 and details how the Air Force plans to increase energy supply, reduce demand and change military culture to meet mission requirements. "Energy is a center of gravity in war and an assured energy advantage can enable victory," said Mark Maybury, chief scientist for the United States Air Force. He spearheaded the report. "While energy is already an essential enabler," Maybury said. "Global competition, environmental objectives and economic imperatives will only increase its importance." Space is the "ultimate high ground," providing access to every part of the globe, including denied areas, the report explains. "Space also has the unique characteristic that once space assets reach space, they require comparatively small amounts of energy to perform their mission, much of which is renewable," it states. [Top 10 Space Weapons]

And, that means the aff also results in distributed satellite systems

David 12 (Leonard David has been reporting on the space industry for more than five decades. He is a winner of last year's National Space Club Press Award and a past editor-in-chief of the National Space Society's Ad Astra and Space World magazines. He has written for SPACE.com since 1999. “Air Force Eyes Nuclear Reactors, Beamed Power for Spacecraft” http://www.space.com/14643-air-force-space-nuclear-reactors-power-beaming.html)

Work on small modular nuclear reactors on Earth is highlighted in the Air Force report: "While the implementation of such a technology should be weighed heavily against potential catastrophic outcomes, many investments into small modular reactors can be leveraged for space-based systems. As these nuclear power plants decrease in size, their utility on board space-based assets increases." The report explains that the Air Force space systems portfolio should consider piloting small modular nuclear systems, a view previously recommended by the Air Force Scientific Advisory Board. The Air Force report also delves into the wireless transfer of power, a technology that continues to offer big promises despite the daunting challenges involved in making it a reality. While there are many challenges in "space-to-earth" power beaming, "space-to-space power beaming" could be transformational, the report stresses. An energy-beaming benefit for the military is powering sets of fractionated, distributed satellite systems, the report explains. *Doing so would enable spacecraft to be smaller, more survivable*, and more capable than current systems.

That leads to reciprocal reaction cycles which culminate in arms race

Hoey 8 (Matthew Hoey is a former senior research associate at the Institute for Defense and Disarmament Studies, where he researched and forecasted missile defense and space weaponization technologies. “The proliferation of space warfare technology” <http://thebulletin.org/web-edition/features/the-proliferation-of-space-warfare-technology> //Donnie)

To answer these questions, we need to look at the impact of the delineation between academic versus military research within a global economy. Examples of the overlap of military and academic research easily can be observed in conferences and invited talks. But in the future, the lines that separate military and civilian technologies will become even more blurred as broad-based collaborations continue to develop multi-use systems with both peaceful commercial and destructive military applications. This would result in the further inability of the arms control community to classify and define space systems into their respective categories and thus, develop meaningful arms control treaties. Furthermore, as peaceful scientific applications progress in a global fashion, private space system developers have the benefits of accessing both domestic and foreign markets, undermining U.S. national space security plans and the pursuit of military space dominance. U.S. policy makers might respond to these developments by encouraging a climate of secrecy to prevent security vulnerabilities. But if such a policy is pursued, companies developing technologies for commercial applications in the United States will suffocate in isolation, while those developing applications in support of military space dominance will continue to flourish. Rival nations will then likely take reciprocal actions, which would further claims by U.S. war planners that other spacefaring nations are working toward the development of space warfare systems. In this type of scenario--and in the absence of a well-defined arms control treaty--space warfare technology proliferation and espionage would continue to grow globally and the existing military space race would accelerate. In addition, the realignment of the global economy will continue to shift the international space power balance in the future, as international players such as India and China will continue to effectively challenge U.S. hegemony in space. For nations that possess the wealth, infrastructure, and knowledge to develop space warfare technologies, their ability to succeed will only require the will or the need to do so. The "brain drain" that hindered the space programs of many rival nations in decades past weighs less on them today. Plus, the stagnancy of foreign economies that resulted in a flood of scientific minds to the United States is ebbing; many expatriates are now returning home to profitable jobs in booming domestic defense and space industries. For its part, the United States continues to strive for technologies that will keep its soldiers safe, support bloodless wars, and allow war to be waged from air-conditioned control rooms--all of which can be achieved only if Washington has a dominant role in the development of advanced technologies that allow for the evolution of current space capabilities. Technologies such as nanotechnology, robotics, and artificial intelligence PDF are seen as the leading candidates for facilitating such an evolution. A new U.S. Air Force television ad campaign that shows young men and women combating cyber warfare from the comfort of a computer terminal makes this evident. Such images serve as a tool to win over public opinion, enabling national consensus in favor of the weaponization of space. Will a similar sentiment resonate with the international community? Is it possible that in the future we will witness the international community embrace and employ nondestructive methods to disrupt or degrade the space systems of hostile nations in support of peacekeeping and casualty reductions? And once the space warfare threshold is crossed, will a nation on the verge of defeat be left with no choice but to attack the space assets that are decimating its forces or the ground stations that are critical to a space-based weapons functionality and operational integrity?

#### And, the plans specific improvement of military satellites uniquely causes space weaponization

Hoey 6 (Matthew Hoey is a Research Associate at the Institute for Defense and Disarmament Studies. This paper is based on a presentation by Mr. Hoey at the “Symposium on Non-proliferation and Disarmament—The Way Forward” in October 2005. <http://www.thespacereview.com/article/563/2> //Donnie)

In sum, we have three rapidly evolving technologies that will accelerate military space projects and make them more affordable. These are: short-notice launch capabilities; next generation small satellites that significantly reduce launch costs and are capable of direct engagement; and ESPA-ring technologies and similar deployment stages for launch vehicles. Technology forecasting suggests that once fully integrated, these technologies will significantly reduce the cost of the militarization of space process and its transition to weaponization. Programs are in development, the defense and research communities are hard at work, and there is no adequate international legal framework in place to ensure that ASAT systems and weapons will not be placed in space. Weaponization will first be initiated in space asset protection systems, built on small satellite platforms, under the guise of asset protect systems with active defense capabilities. Once such systems are in place, the act of attacking or compromising an enemy space system will be limited only the intention of the user. The road to space being weaponized may also be shortened thanks in part to a space-based missile defense system—should it be developed.

#### The plan facilitates asat weapons, that causes nuclear war and turns case

Hoey 6 (Matthew Hoey is a Research Associate at the Institute for Defense and Disarmament Studies. This paper is based on a presentation by Mr. Hoey at the “Symposium on Non-proliferation and Disarmament—The Way Forward” in October 2005. <http://www.thespacereview.com/article/563/2> //Donnie)

This presentation offers a snapshot of military space and dual-use technologies that are in various stages of research and development. Tax dollars are being spent, defense contractors are hard at work, and various branches of the military are awaiting results. It is time for discussion nationally and internationally by concerned citizens, public policy analysts, and academics. With technological capabilities being researched, developed, close to deployment—and in some cases already deployed—is there an operable, deployed ASAT system on the horizon, without internationally-agreed, clearly-defined rules and limitations? The answer is certainly yes. True, some of these systems may be “dream” technologies that will never reach the point of viability. For systems that are technically possible, however, we must ask, are they desirable? If deployed, will their impact on international security be positive or negative? If negative, what steps might be taken to prevent such developments? Many people believe that a deployed anti-satellite capability and an ability to attack targets on or near the Earth’s surface from space would create a global climate of insecurity both by enhancing current risks and by creating new problems. These new and increased risks would be the byproducts not only of systems to be deployed by the United States but also of the subsequent arms race in space which could be expected to result thanks to responses by China, Russia, the European Union, and perhaps Japan. Perhaps the most consequential impact would be increasing the probability of accidental nuclear war. Space-based weapons could shorten the road to armed conflict, whether nuclear or conventional. In the event that a space asset of one nation was attacked by another (on purpose or by accident), an immediate military response would be triggered, shortening the diplomatic process while escalating the armed conflict. Once employed regularly, anti-satellite systems and space weapons would litter LEO with debris, which in turn would permanently compromise our collective ability to explore the heavens and use space for constructive commercial purposes. The weaponization of space and the deployment of ASAT systems would undermine existing international arms control treaties that are already under stress. In addition, they would fly in the face of the collective will of the international community, which has demanded a ban on weapons in space for two decades and repeatedly been blocked by the United States. For those who share these concerns, one thing is certain: the time for international negotiations on a treaty to ban weapons in space is long overdue. Within a very few years, this potential development could become a reality.

#### Nuclear power is key to space weaponization---without it projects are physically impossible

Grossman 12 ((Karl Grossman, professor of journalism at the State University of New York/College of New York, is the author of the book, The Wrong Stuff: The Space's Program's Nuclear Threat to Our Planet (Common Courage Press) and wrote and presented the TV program Nukes In Space: The Nuclearization and Weaponization of the Heavens (http://www.envirovideo.com). “The Deadly Folly of Nuclear Power Overhead” http://karlgrossman.blogspot.com/2012/04/deadly-folly-of-nuclear-power-overhead.html)

The plan for nuclear-powered bombers was finally scuttled because of the problem of providing heavy lead shielding to protect the crew from radiation and, as then U.S. Secretary of Defense Robert McNamara told Congress in 1961, an atomic airplane would “expel some fraction of radioactive fission products into the atmosphere, creating an important public relations problem if not an actual physical hazard.” A subsequent program linking nuclear power and weapons was the Star Wars program under President Ronald Reagan. It was “predicated,” as Gagnon notes, “on nuclear power in space.” Reactors and also a “Super RTG” to be built by General Electric were to provide the energy on orbiting battle platforms for lasers, hypervelocity guns and particle beam weapons. In my book, The Wrong Stuff: The Space Program’s Nuclear Threat to Our Planet,” and TV documentary, Nukes in Space: The Nuclearization and Weaponization of the Heavens, I noted the 1988 declaration of Lt. General James Abramson, first head of the Strategic Defense Initiative, that “without reactors in orbit [there is] going to be a long, long light cord that goes down to the surface of Earth” bringing up power. He stated: “Failure to develop nuclear power in space could cripple efforts to deploy anti-missile sensors and weapons in orbit.” As to nuclear-propelled rockets, the U.S. has a long history of seeking to build them from the 1950s onward. There was a program called Nuclear Engine for Rocket Vehicle Application or NERVA followed by Projects Pluto, Rover and Poodle. And in the 1980s, the Timberwind nuclear-powered rocket was developed to loft heavy Star Wars equipment into space and also for trips to Mars. Most recently, the Project Prometheus program to build nuclear-powered rockets was begun by NASA in 2003. Through the years there have been major concerns over a nuclear rocket blowing up on launch or crashing back to Earth. The Soviet Union, Russia, conducted a parallel space nuclear program—including nuclear-powered satellites, development of a nuclear bomber and nuclear-powered rockets. Now, meanwhile, nuclear power above our heads has been shown as unnecessary. NASA has persisted in using Plutonium-238-powered RTGs on space probes claiming there was no choice. But last year it launched the Juno space probe which is now on its way to Jupiter—getting all its on-board electricity only from solar photovoltaic panels. It’s to arrive in 2016 and make 32 orbits around Jupiter and perform a variety of scientific missions. As NASA stated last week on its website for Juno: “As of April 4, Juno was approximately209 million miles from Earth…The Juno spacecraft is in excellent health.” http://www.nasa.gov/mission\_pages/juno/main/index.html This is despite NASA claiming for decades that only nuclear power could provide on-board power in deep space. Likewise, the European Space Agency in 2004 launched a space probe it calls Rosetta, also using solar energy rather than nuclear power for on-board electricity. It is to rendezvous in 2014 with a comet named 67P/Churyumov-Gerasimenko and send out a lander which will investigate the comet’s surface. At that point it will be 500 million miles from the Sun, a small ball in the sky at that distance, yet Rosetta will still be harvesting solar energy. http://www.esa.int/esaMI/Rosetta/SEMHBK2PGQD\_0.html As to propulsion in space, a highly promising energy source are the ionized particles in space that can be utilized in the frictionless environment with what are being called solar sails. In May 2010, the Japan Exploration Agency launched an experimental spacecraft, Ikaros, that seven months later reached Venus—propelled only by its solar sail. http://www.jaxa.jp/countdown/f17/overview/ikaros\_e.html The Planetary Society is readying a similar mission using a spacecraft named LightSail-1 powered by solar sails and planning for two more ambitious solar sail flights of LightSail-2 and LightSail-3. http://www.planetary.org/programs/projects/solar\_sailing/lightsail1.html These missions do not present threats to life on Earth—as does the use of nuclear power overhead. And the threats of nuclear power overhead can be enormous. For example, consider the projection in NASA’s Final Environmental Impact Statement for the Cassini Mission about the impacts if there were an “inadvertent reentry” of Cassini into Earth’s atmosphere during one of its two “flybys”—whips around the Earth but a few hundred miles high to increase its velocity so it could get to Saturn. If it fell to Earth, broke up in the atmosphere and its 72.3 pounds of Plutonium-238 were released, “5 billion…of the world population…could receive 99 percent or more of the radiation exposure,” projected NASA. Moreover, the production of nuclear fuel on Earth for use in space—or in the atmosphere for drones—constitutes danger, too. Facilities that had been used earlier by the U.S. to produce Plutonium-238, Los Alamos National Laboratory and Mound Laboratory, ended up as hotspots for worker contamination and radioactive pollution. James Powell, executive director of the organization Keep Yellowstone Nuclear Free, which has been opposing the restart of Plutonium-238 production at nearby Idaho National Laboratory, comments: “Aside from the looming danger of nuclear powered crafts above Earth, we should also realize that the nuclear material is to be produced in our backyards with 1960's era nuclear reactors and then transported back and forth from [Oak Ridge National Laboratory in]Tennessee to Idaho. Every single part of this process deeply concerns us.”