# ASU RV Cards Round 2 vs. Iowa DH (Neg)

## 1NC

### 1

#### A. Interpretation – mandating purchases are restrictions, NOT financial incentives.

Menz, Faculty of Economics and Finance, School of Business, Clarkson University, ‘5

[Frederic, also from the Center for International Climate and Environmental Research, Oslo (CICERO), Norway, “Green electricity policies in the United States: case study,” Energy Policy, December, Science Direct]

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.

#### Reduce means to make smaller, Dictionary.com

[http://dictionary.reference.com/browse/reduce?s=t]

1. to bring down to a smaller extent, size, amount, number, etc.: to reduce one's weight by 10 pounds.

#### B. Violation – They increase restrictions by mandating increased procurement contracts.

#### C. Standards

#### 1. Bidirectionality – their interpretation moots the direction of the restrictions part of the topic which allows the affirmative to effectively double their ground. Even if you think that they might also increase an incentive, they also certainly increase a restriction, and the ground advantage this generates outweighs any of their limits or education claims.

#### 2. Topic-specific education – they moot the debate about the market mechanisms of the topic. The predictable mechanism of the topic is to have the federal government either get out of the way of or incentivize the workings of the free market. They have the federal government participate in the market. The negative should always have a right to market bad solvency arguments, which they circumvent.

#### D. Voter for fairness and education.

### 2

#### 1. CIR will pass now

Politico 3/27 (http://www.politico.com/politico44/2013/03/obama-renews-push-on-immigration-reform-160372.html)

President Obama sought to refocus the political conversation on immigration reform Wednesday in interviews with two Spanish-language networks that come after weeks of news cycles dominated by discussions of guns, sequestration and same-sex marriage.¶ In interviews with Telemundo and Univision conducted Wednesday at the White House, the president stayed firm on the immigration reform timeline he set earlier this year and voiced confidence in the bipartisan group of eight senators who are negotiating a bill.¶ “I think we’ve seen enormous progress over the last month and a half,” Obama said in an interview with Telemundo. “I think both sides, Democrats and Republicans, have been very serious about the negotiations. I’m actually very optimistic that when they return in early April … we’ll see a bill ready to move through the process.”¶ "We're seeing right now a good, bipartisan spirit. I want to encourage that," he added on Univision. "Hopefully we'll be able to get it done."

#### 2. Obama’s capital is key to holding the coalition together

Bloomberg 3/22 (Guest-Worker Visas Sticking Point on Immigration Rewrite, http://www.bloomberg.com/news/2013-03-21/guest-worker-visas-sticking-point-on-immigration-rewrite.html)

With Senate Republicans and Democrats moving closer to an agreement to grant a chance at U.S. citizenship to 11 million undocumented immigrants, a long- simmering dispute between organized labor and the business lobby risks sapping momentum for the measure.¶ The two constituencies are at odds over a new program to provide U.S. work visas to low-skilled foreign workers, placing pressure on lawmakers poised for a compromise. Unions are pressing for a limited visa system that guarantees better wages for future immigrant workers, while businesses seek a broader program more responsive to their hiring needs.¶ It’s the tougher side of what is otherwise a broadening consensus in both parties around an immigration plan, whose centerpiece is a path to U.S. citizenship for undocumented immigrants. A bipartisan group of eight senators is nearing a deal to bolster border security and workplace verification while revamping the legal immigration system.¶ Republican Senator Marco Rubio of Florida, a member of the group, called the guest-worker issue “one of the more difficult parts” of the negotiations.¶ “I’m not going to be part of a bill that doesn’t create a process whereby people can come to this country temporarily in the future if we need them,” Rubio said yesterday. “There’s no secret that the broader labor movement, with some exceptions, would rather not even have an immigration bill.”¶ Political Consequences¶ The disagreement carries significant political consequences for Republicans and Democrats alike, essentially making them choose between their strongest constituencies -- organized labor for Democrats and big business for Republicans -- and achievement of an overriding policy goal that both parties increasingly see as an electoral imperative.¶ Hispanics accounted for 10 percent of voters in the 2012 presidential election. President Barack Obama won 71 percent of their votes, and just 27 percent backed Republican nominee Mitt Romney, who had proposed “self-deportation” for undocumented immigrants. Since then, a growing chorus of Republicans has publicly backed legal status for undocumented immigrants.¶ Meanwhile, a group of Republican officials who unveiled a top-to-bottom review this week called for the party to back “comprehensive immigration reform” or see its appeal shrink.¶ “It is in neither party’s interest for one group within a party to stop this, because it is bad for the economy if we don’t have immigration reform,” former Mississippi Governor and Republican National Committee Chairman Haley Barbour said this week, referring to labor unions’ objections to a guest-worker program.¶ Worker Program¶ Former Pennsylvania Governor Ed Rendell, a Democrat co- chairing an immigration task force with Barbour at the Bipartisan Policy Center in Washington, said it is ultimately up to Obama to persuade Democrats not to abandon the bill if the immigrant-worker program doen’t match the unions’ agenda.¶ “If we don’t get guest-worker provisions that are exactly in line with what labor wants, we can’t hold up the bill because of that,” Rendell said. “We’ve got to do the best we can to preserve and protect the interests of organized labor, but in the end you can’t always get what you want.”¶ The president, he added, has “his work cut out for him.”¶ The bipartisan plan, expected to be unveiled early next month following a two-week congressional break, also faces a potentially rough road in the Senate and uncertain fate in the House, where Republican opposition to granting citizenship to undocumented immigrants is more prevalent.¶

#### 3. Pushing clean energy is unpopular and partisan.

LVS, ‘12

[Las Vegas Sun, 11-11-12, “Will Republicans play ball on Obama’s lofty second-term agenda?”, http://www.lasvegassun.com/news/2012/nov/11/will-republicans-play-ball-obamas-lofty-second-ter/]

But the phrase “cap-and-trade” makes conservatives see almost as much red as the name Nancy Pelosi. Plus, large swaths of the country — including some longtime Democrats — are beginning to doubt that there’s any real payoff to renewable energy investments. “It’s a lot of hocus-pocus,” said Nick Taylor, 42, a lifelong Las Vegas Democrat and single father of seven who voted for Romney. He used to have a job constructing solar panels with Bombard Electric. “We all made a lot of money doing it, but now the systems don’t work. ... Those are garbage now.” That’s left many lawmakers thinking the status quo may be better than the compromise. “Energy — that just divides the parties so much, and it’s something that the public isn’t really sold on,” Damore said, explaining that despite the arched rhetoric on both sides, the feeling of urgency is still too weak to push the parties to work something out. “Clean energy was sold as job creation, and now that doesn’t seem to have happened .. and it's not like the oil and gas industry is going anywhere.”

#### 4. Immigration reform key to US lead on biotech innovation

Scullion ’13 (Christine, “Manufacturers Take the Lead In STEM Education”, January 8, <http://www.shopfloor.org/2013/01/manufacturers-take-the-lead-in-stem-education/27254>, CMR)

The U.S. the leading producer of cutting-edge products such as those on display at the Consumer Electronics Show. Whether it’s in IT, biotech, aerospace, medical devices or heavy machinery, US companies will be the ones to constantly and consistently create new and better things. This future promises to be bright, but only if we have the workforce capable of pushing that leading-edge. And right now, that doesn’t look like a very good bet. The lack of a skilled workforce is a constant threat to manufacturing growth. In fact in a recent survey 82% of manufacturers reported a moderate-to-serious shortage in skilled production labor. Worker shortages abound not only among machinists and welders but also in occupations requiring expertise in the fields of science, technology, engineering and math (STEM), where the unemployment rate today lies well below 4%.¶ The US needs to refocus our workforce training resources and reform our immigration system to continue to grow and innovate. Immigration reform is a serious issue for Manufacturers not only in the High-tech arena but across manufacturing sectors. Without a skilled workforce – from the PhDs to production labor, the nation’s economy will suffer and jobs will be moved overseas. Access to the right individual with the right skills at the right time will ensure that the US remains a global innovation leader.

#### 5. Biotech innovation key to solve bioterror

Chyba & Greninger, 4 - Co-Director of the Center for International Security and Cooperation (CISAC), Stanford Institute for International Studies, and an Associate Professor at Stanford University

[Christopher & Alex, “Biotechnology and Bioterrorism: An Unprecedented World” Survival, 46:2, Summer 2004]

In the absence of a comprehensive and effective system of global review of potential high-consequence research, we are instead trapped in a kind of offence–defence arms race. Even as legitimate biomedical researchers develop defences against biological pathogens, bad actors could in turn engineer countermeasures in a kind of directed version of the way natural pathogens evolve resistance to anti-microbial drugs. The mousepox case provides a harbinger of what is to come: just as the United States was stockpiling 300m doses of smallpox vaccine as a defence against a terrorist smallpox attack, experimental modification of the mousepox virus showed how the vaccine could possibly be circumvented. The United States is now funding research on antiviral drugs and other ways of combating smallpox that might be effective against the engineered organism. Yet there are indications that smallpox can be made resistant to one of the few known antiviral drugs. **The future has the appearance of an** eternal arms race of measures and countermeasures. The ‘arms race’ metaphor should be used with caution; it too is in danger of calling up misleading analogies to the nuclear arms race of the Cold War. First, the biological arms race is an offence–defence race, rather than a competition between offensive means. Under the BWC, only defensive research is legitimate. But more fundamentally, the driver of de facto offensive capabilities in this arms race is not primarily a particular adversary, but rather the ongoing global advance of microbiological and biomedical research. Defensive measures **are in** a race with nefarious applications of basic research, much of which is itself undertaken for protection against natural disease. In a sense, we are in an arms race with ourselves. It is hard to see how this arms race is stable – an offence granted comparable resources would seem to be necessarily favoured. As with ballistic missile defence, particular defensive measures may be defeated by offensive countermeasures. **In the biological case, implementing defensive measures will require** not only **research** but drug development and distribution plans. Offensive measures need not exercise this care, although fortunately they will likely face comparative resource constraints (especially if not associated with a state programme), and may find that some approaches (for example, to confer antibiotic resistance) have the simultaneous effect of inadvertently reducing a pathogen’s virulence. The defence must always guard against committing the fallacy of the last move, whereas the offence may embrace the view of the Irish Republican Army after it failed to assassinate the British cabinet in the 1984 Brighton bombing: ‘Today we were unlucky, but remember we have only to be lucky once – you will have to be lucky always’.40 At the very least, the defence will have to be vigilant and collectively smarter than the offence. **The only way for the defence to win** convincingly in the biological arms race **would** seem to **be to succeed in discovering and implementing** certain de facto last-move defences, at least on an organism-by-organism basis. Perhaps there are defences, or a web of defences, that will prove too difficult for any plausible non-state actor to engineer around. Whether **such defences** exist is unclear at this time, but their exploration **should be a long-term research goal of US biodefence** efforts. Progress might also have an important impact on international public health. One of the ‘Grand Challenges’ identified by the Bill and Melinda Gates Foundation in its $200m initiative to improve global health calls for the discovery of drugs that minimise the emergence of drug resistance – a kind of ‘last move’ defence against the evolutionary countermeasures of natural microbes.41 **Should** a collection of such **defensive moves prove possible**, **bioterrorism might ultimately succumb to** a kind of globalised **dissuasion by denial**:42 non-state groups would calculate that they could not hope to achieve dramatic results through biological programmes and would choose to direct their efforts elsewhere.

#### 6. Extinction

Steinbruner 97 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 1997, 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.

### 3

#### Text: The United States Federal Government should procure small modular reactors for military bases in the United States.

#### DOD is key – solves commercialization, overcomes restrictions and doesn’t link to politics.

Madia, Chairman of the Board of Overseers and Vice President for the SLAC National Accelerator Laboratory at Stanford University, ‘12

[William, Spring, "Small Modular Reactors: A Potential Game-changing Technology", energyclub.stanford.edu/index.php/Journal/Small\_Modular\_Reactors\_by\_William\_Madia]

To determine if SMRs hold the potential for changing the game in carbon-free power generation, it is imperative that we test the design, engineering, licensing, and economic assumptions with some sort of public-private development and demonstration program. Instead of having government simply invest in research and development to “buy down” the risks associated with SMRs, I propose a more novel approach. Since the federal government is a major power consumer, it should commit to being the “first mover” of SMRs. This means purchasing the first few hundred MWs of SMR generation capacity and dedicating it to federal use. The advantages of this approach are straightforward. The government would both reduce licensing and economic risks to the point where utilities might invest in subsequent units, thus jumpstarting the SMR industry. It would then also be the recipient of additional carbon-free energy generation capacity. This seems like a very sensible role for government to play without getting into the heavy politics of nuclear waste, corporate welfare, or carbon taxes.¶ If we want to deploy power generation technologies that can realize near-term impact on carbon emissions safely, reliably, economically, at scale, and at total costs that are manageable on the balance sheets of most utilities, we must consider SMRs as a key component of our national energy strategy.

#### SMRs solve warming

Palley, ‘11

[Reese, The London School of Economics, 2011, The Answer: Why Only Inherently Safe, Mini Nuclear Power Plans Can Save Our World, p. 168-71]

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

#### SMRs are essential to prevent cyber-terrorism and grid collapse.

Robitaille, Department of Army Civilian, ‘12

[George, March 21, "Small Modular Reactors: The Army’s Secure Source of Energy?", [www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA561802](http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA561802)]

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

#### SMRs solve water shortages - desalination

EPI ‘10

[Energy Policy Institute, June 2010, “Economic and Employment Impacts of Small Modular Nuclear Reactors” http://epi.boisestate.edu/media/3494/economic%20and%20employment%20impacts%20of%20smrs.pdf]

Desalination. The IAEA has identified desalination as possibly the leading non-­‐electric civilian use for nuclear energy. Water scarcity is becoming an increasingly problematic global issue in both developed and developing countries. As noted in an IAEA (2007) report,¶ Because of population growth, surface water resources are increasingly stressed in many parts of the world, developed and developing regions alike. Water stress is counter to sustainable development; it engenders disease; diverts natural flows, endangering flora and fauna of rivers, lakes wetlands, deltas and oceans; and it incites regional conflicts over water rights. In the developing world, more than one billion people currently lack access to safe drinking water; nearly two and a half billion lack access to adequate sanitation services. This would only get these trends, many opportunities in both developed and developing countries are foreseen for supply of potable water generated using nuclear process heat or off-­‐peak electricity (p. 23).¶ The desalination of sea water requires large amounts of energy and is not dependent on a particular fuel production of potable water from sea water in a facility in which a nuclear reactor is used as the source of energy for the desalination. The three technologies that comprise nuclear desalination are nuclear, the desalination method, and the system that couples them together (IAEA, 2000). The feasibility of integrated nuclear desalination plants has been proven with over 175 reactor-­‐years of experience worldwide (IAEA, 2007a). Large-­‐scale, proven commercial technologies for desalination can be grouped into distillation processes and the reverse osmosis process. Distillation technologies require heat to create steam which condenses and separates fresh water from brine. Reverse osmosis requires only electricity to push fresh water from the higher pressure saltwater side of a semi-­‐permeable membrane to the lower pressure freshwater side. An IAEA study (2007a) on the economics of nuclear desalination reported that SMRs offer the largest potential as coupling options to nuclear desalination systems in developing countries (p. 4). Furthermore, the study found that the costs for nuclear desalination are roughly similar to that of natural gas desalination, and could be substantially lower depending on fuel costs (IAEA, 2007a). Based on a preliminary assessment of the global desalination market through 2030, particularly in developing countries, desalination has the potential to provide a strong market for SMRs if they can successfully compete with conventional nuclear plants and other sources of generation (Arthur, 2010).

### Grid

#### Solar power hurts the grid

JADHAV 11 (May 18, 2011, NILESH, “Solar Energy Intermittency: Grid operator’s nightmare?,” Solar Novus Today, http://www.solarnovus.com/index.php?option=com\_content&view=article&id=2824:solar-energy-intermittency-grid-operators-nightmare&catid=75:editors-blogs&Itemid=352, Aug 1, 12)MJG

However, grid operators worry when solar energy forms a significant portion of the generation mix (say 10-30%). The concern is that such a scenario is unmanageable due to the fact that spinning reserves and peak power generation capacity may not be sufficiently available. The conclusion by some grid operators is that solar energy cannot really provide major share of electricity generation, which could be bad news for grid-connected solar. This leads to the question of whether there is an upper limit on grid-connected solar systems that is actually much smaller (e.g., <10%) than what many forecast today?

#### Grid is resilient and sustainable.

Clark, MA Candidate – Intelligence Studies @ the American Military University, ‘12

[Paul, senior analyst – Chenega Federal Systems, 4/28/’12, , “The Risk of Disruption or Destruction of Critical U.S. Infrastructure by an Offensive Cyber Attack,” American Military University]

In 2003, a simple physical breakdown occurred – trees shorted a power line and caused a fault – that had a cascading effect and caused a power blackout across the Northeast (Lewis 2010). This singular occurrence has been used as evidence that the electrical grid is fragile and subject to severe disruption through cyber-attack, a disruption that could cost billions of dollars, brings business to a halt, and could even endanger lives – if compounded by other catastrophic events (Brennan 2012). A power disruption the size of the 2003 blackout, the worst in American¶ history at that time (Minkel 2008), is a worst case scenario and used as an example of the¶ fragility of the U.S. energy grid. This perceived fragility is not real when viewed in the context¶ of the robustness of the electrical grid.¶ When asked about cyber-attacks against the electrical grid in April of 2012, the¶ intelligence chief of U.S. Cyber Command Rear Admiral Samuel Cox stated that an attack was¶ unlikely to succeed because of the “huge amounts of resiliency built into the [electrical] system¶ that makes that kind of catastrophic thing very difficult” (Capaccio 2012). This optimistic view¶ is supported by an electrical grid that has proven to be robust in the face of large natural¶ catastrophes. Complex systems like the electrical grid in the U.S. are prone to failures and the¶ U.S. grid fails frequently. Despite efforts to reduce the risk out power outages, the risk is always¶ present. Power outages that affect more than 50,000 people have occurred steadily over the last¶ 20 years at a rate of 12% annually and the frequency of large catastrophes remains relatively¶ high and outages the size of the 2003 blackout are predicted to occur every 25 years (Minkel¶ 2008). In a complex system that is always at risk of disruption, the effect is mitigated by policies¶ and procedures that are meant to restore services as quickly as possible. The most visible of these policies is the interstate Emergency Management Assistance Compact, a legally binding¶ agreement allowing combined resources to be quickly deployed in response to a catastrophic¶ disaster such as power outages following a severe hurricane (Kapucu, Augustin and Garayev¶ 2009).¶ The electrical grid suffers service interruptions regularly, it is a large and complex system¶ supporting the largest economy in the world, and yet commerce does not collapse (Lewis 2010).¶ Despite blizzards, earthquakes, fires, and hurricanes that cause blackouts, the economy is¶ affected but does not collapse and even after massive damage like that caused by Hurricane¶ Katrina, national security is not affected because U.S. military capability is not degraded (Lewis¶ 2010).¶ Cyber-security is an ever-increasing concern in an increasingly electronic and¶ interconnected world. Cyber-security is a high priority “economic and national security¶ challenge” (National Security Council n.d.) because cyber-attacks are expected to become the¶ top national security threat (Robert S. Mueller 2012). In response to the threat Congress is¶ crafting legislation to enhance cyber-security (Brito and Watkins 2012) and the Department of¶ Homeland Security budget for cyber-security has been significantly increased (U.S. Senate¶ Committee on Homeland Security and Governmental Affairs 2012).

#### No impact to cyberattacks on the grid nor blackouts – Katrina proves.

Lewis, senior fellow and director of the Technology and Public Policy Program @ CSIS, ‘10

[James, The Electrical Grid as a Target for Cyber Attack, http://csis.org/files/publication/100322\_ElectricalGridAsATargetforCyberAttack.pdf]

This conclusion is different from the strategic consequences on a cyber attack on the power grid. The United States routinely suffers blackouts. The nation does not collapse. In the short term, military power and economic strength are not noticeably affected - a good example for opponents to consider is Hurricane Katrina, which caused massive damage but did not degrade U.S. military power in or even long-term economic performance. Is there any cyber attack that could match the hurricane? The United States is a very large collection of targets with many different pieces making up its electrical infrastructure. While a single attack could interrupt service, the large size and complexity of the American economy make it more resilient. Even without a Federal response plan, the ability of electrical companies to work quickly together to restore service is impressive and we should not underestimate the ingenuity of targets to recover much more rapidly than expected. This is a routine occurrence in aerial bombing: impressive damage is quickly rectified by a determined opponent.

#### Cyberattacks impossible – empirics and defenses solve.

Rid, Reader in War Studies at King’s College London, ‘12

[Thomas, author of "Cyber War Will Not Take Place" and co-author of "Cyber-Weapons”, “Think Again: Cyberwar”,

http://www.foreignpolicy.com/articles/2012/02/27/cyberwar?page=full]

"Cyberwar Is Already Upon Us." No way. "Cyberwar is coming!" John Arquilla and David Ronfeldt predicted in a celebrated Rand paper back in 1993. Since then, it seems to have arrived -at least by the account of the U.S. military establishment, which is busy competing over who should get what share of the fight. Cyberspace is "a domain in which the Air Force flies and fights," Air Force Secretary Michael Wynne claimed in 2006. By 2012, William J. Lynn III, the deputy defense secretary at the time, was writing that cyberwar is "just as critical to military operations as land, sea, air, and space." In January, the Defense Department vowed to equip the U.S. armed forces for "conducting a combined arms campaign across all domains -land, air, maritime, space, and cyberspace." Meanwhile, growing piles of books and articles explore the threats of cyberwarfare, cyberterrorism, and how to survive them. Time for a reality check: Cyberwar is still more hype than hazard. Consider the definition of an act of war: It has to be potentially violent, it has to be purposeful, and it has to be political. The cyberattacks we've seen so far, from Estonia to the Stuxnet virus, simply don't meet these criteria. Take the dubious story of a Soviet pipeline explosion back in 1982, much cited by cyberwar's true believers as the most destructive cyberattack ever. The account goes like this: In June 1982, a Siberian pipeline that the CIA had virtually booby-trapped with a so-called "logic bomb" exploded in a monumental fireball that could be seen from space. The U.S. Air Force estimated the explosion at 3 kilotons, equivalent to a small nuclear device. Targeting a Soviet pipeline linking gas fields in Siberia to European markets, the operation sabotaged the pipeline's control systems with software from a Canadian firm that the CIA had doctored with malicious code. No one died, according to Thomas Reed, a U.S. National Security Council aide at the time who revealed the incident in his 2004 book, At the Abyss; the only harm came to the Soviet economy. But did it really happen? After Reed's account came out, Vasily Pchelintsev, a former KGB head of the Tyumen region, where the alleged explosion supposedly took place, denied the story. There are also no media reports from 1982 that confirm such an explosion, though accidents and pipeline explosions in the Soviet Union were regularly reported in the early 1980s. Something likely did happen, but Reed's book is the only public mention of the incident and his account relied on a single document. Even after the CIA declassified a redacted version of Reed's source, a note on the so-called Farewell Dossier that describes the effort to provide the Soviet Union with defective technology, the agency did not confirm that such an explosion occurred. The available evidence on the Siberian pipeline blast is so thin that it shouldn't be counted as a proven case of a successful cyberattack. Most other commonly cited cases of cyberwar are even less remarkable. Take the attacks on Estonia in April 2007, which came in response to the controversial relocation of a Soviet war memorial, the Bronze Soldier. The well-wired country found itself at the receiving end of a massive distributed denial-of-service attack that emanated from up to 85,000 hijacked computers and lasted three weeks. The attacks reached a peak on May 9, when 58 Estonian websites were attacked at once and the online services of Estonia's largest bank were taken down. "What's the difference between a blockade of harbors or airports of sovereign states and the blockade of government institutions and newspaper websites?" asked Estonian Prime Minister Andrus Ansip. Despite his analogies, the attack was no act of war. It was certainly a nuisance and an emotional strike on the country, but the bank's actual network was not even penetrated; it went down for 90 minutes one day and two hours the next. The attack was not violent, it wasn't purposefully aimed at changing Estonia's behavior, and no political entity took credit for it. The same is true for the vast majority of cyberattacks on record. Indeed, there is no known cyberattack that has caused the loss of human life. No cyberoffense has ever injured a person or damaged a building. And if an act is not at least potentially violent, it's not an act of war. Separating war from physical violence makes it a metaphorical notion; it would mean that there is no way to distinguish between World War II, say, and the "wars" on obesity and cancer. Yet those ailments, unlike past examples of cyber "war," actually do kill people. "A Digital Pearl Harbor Is Only a Matter of Time." Keep waiting. U.S. Defense Secretary Leon Panetta delivered a stark warning last summer: "We could face a cyberattack that could be the equivalent of Pearl Harbor." Such alarmist predictions have been ricocheting inside the Beltway for the past two decades, and some scaremongers have even upped the ante by raising the alarm about a cyber 9/11. In his 2010 book, Cyber War, former White House counterterrorism czar Richard Clarke invokes the specter of nationwide power blackouts, planes falling out of the sky, trains derailing, refineries burning, pipelines exploding, poisonous gas clouds wafting, and satellites spinning out of orbit -events that would make the 2001 attacks pale in comparison. But the empirical record is less hair-raising, even by the standards of the most drastic example available. Gen. Keith Alexander, head of U.S. Cyber Command (established in 2010 and now boasting a budget of more than $3 billion), shared his worst fears in an April 2011 speech at the University of Rhode Island: "What I'm concerned about are destructive attacks," Alexander said, "those that are coming." He then invoked a remarkable accident at Russia's Sayano-Shushenskaya hydroelectric plant to highlight the kind of damage a cyberattack might be able to cause. Shortly after midnight on Aug. 17, 2009, a 900-ton turbine was ripped out of its seat by a so-called "water hammer," a sudden surge in water pressure that then caused a transformer explosion. The turbine's unusually high vibrations had worn down the bolts that kept its cover in place, and an offline sensor failed to detect the malfunction. Seventy-five people died in the accident, energy prices in Russia rose, and rebuilding the plant is slated to cost $1.3 billion. Tough luck for the Russians, but here's what the head of Cyber Command didn't say: The ill-fated turbine had been malfunctioning for some time, and the plant's management was notoriously poor. On top of that, the key event that ultimately triggered the catastrophe seems to have been a fire at Bratsk power station, about 500 miles away. Because the energy supply from Bratsk dropped, authorities remotely increased the burden on the Sayano-Shushenskaya plant. The sudden spike overwhelmed the turbine, which was two months shy of reaching the end of its 30-year life cycle, sparking the catastrophe. If anything, the Sayano-Shushenskaya incident highlights how difficult a devastating attack would be to mount. The plant's washout was an accident at the end of a complicated and unique chain of events. Anticipating such vulnerabilities in advance is extraordinarily difficult even for insiders; creating comparable coincidences from cyberspace would be a daunting challenge at best for outsiders. If this is the most drastic incident Cyber Command can conjure up, perhaps it's time for everyone to take a deep breath. "Cyberattacks Are Becoming Easier." Just the opposite. U.S. Director of National Intelligence James R. Clapper warned last year that the volume of malicious software on American networks had more than tripled since 2009 and that more than 60,000 pieces of malware are now discovered every day. The United States, he said, is undergoing "a phenomenon known as 'convergence,' which amplifies the opportunity for disruptive cyberattacks, including against physical infrastructures." ("Digital convergence" is a snazzy term for a simple thing: more and more devices able to talk to each other, and formerly separate industries and activities able to work together.) Just because there's more malware, however, doesn't mean that attacks are becoming easier. In fact, potentially damaging or life-threatening cyberattacks should be more difficult to pull off. Why? Sensitive systems generally have built-in redundancy and safety systems, meaning an attacker's likely objective will not be to shut down a system, since merely forcing the shutdown of one control system, say a power plant, could trigger a backup and cause operators to start looking for the bug. To work as an effective weapon, malware would have to influence an active process -but not bring it to a screeching halt. If the malicious activity extends over a lengthy period, it has to remain stealthy. That's a more difficult trick than hitting the virtual off-button. Take Stuxnet, the worm that sabotaged Iran's nuclear program in 2010. It didn't just crudely shut down the centrifuges at the Natanz nuclear facility; rather, the worm subtly manipulated the system. Stuxnet stealthily infiltrated the plant's networks, then hopped onto the protected control systems, intercepted input values from sensors, recorded these data, and then provided the legitimate controller code with pre-recorded fake input signals, according to researchers who have studied the worm. Its objective was not just to fool operators in a control room, but also to circumvent digital safety and monitoring systems so it could secretly manipulate the actual processes. Building and deploying Stuxnet required extremely detailed intelligence about the systems it was supposed to compromise, and the same will be true for other dangerous cyberweapons. Yes, "convergence," standardization, and sloppy defense of control-systems software could increase the risk of generic attacks, but the same trend has also caused defenses against the most coveted targets to improve steadily and has made reprogramming highly specific installations on legacy systems more complex, not less.

#### No lashout – probability of miscalc is zero.

Quinlan, Consulting Senior Fellow for South Asia International Institute for Strategic Studies, ‘9

[Michael, 2009, “Thinking About Nuclear Weapons,” Amazon]

Similar considerations apply to the hypothesis of nuclear war being mistakenly triggered by false alarm. Critics again point to the fact, as it is understood, of numerous occasions when initial steps in alert sequences for US nuclear forces were embarked upon, or at least called for, by indicators mistaken or misconstrued. In none of these Instances, it Is accepted, did matters get at all near to nuclear launch—extraordinary good fortune again. critics have suggested. But the rival and more logical inference from hundreds of events stretching over sixty years of experience presents Itself once more: that the probability of initial misinterpretation leading far towards mistaken launch is remote. Precisely because any nuclear-weapon possessor recognizes the vast gravity of any launch, release sequences have many steps, and human decision is repeatedly interposed as well as capping the sequences. To convey that because a first step was prompted the world somehow came close to accidental nuclear war is wild hyperbole, rather like asserting, when a tennis champion has lost his opening service game, that he was nearly beaten in straight sets. History anyway scarcely offers any ready example of major war started by accident even before the nuclear revolution imposed an order-of-magn itude increaw In caution. It was occasionally conjectured that nuclear war might be triggered by the real but accidental or unauthorized launch of a strategic nuclear-weapon delivery system in the direction of a potennal adversay)’. No such launch is known to have occurred In over sixty years. The probability of it is thcrcfore very low. But even if it did happen, the further hypothesis of its initiating a general nuclear exchange is far-fetched. It fails to consider the real situation of decision-makers, as pages 6—4 have brought out. The notion that cosmic holocaust might be mistakenly precipitated In this way belongs to science fiction. one special form of miscalculation appeared sporadically in the speculations of academic commentators, though it was scarcely ever to be encountered—at least so far as my own observation went—in the utterances of practical planners within government. This is the idea that nuclear war might be erroneously triggered, or erroneously widened, through a state under attack misreading either what sort of attack it was lwing subjected to, or where the attack came from. One special form of miscalculation appeared sporadically in the speculations of academic commentators, though it was scarcely ever to be encountered—at least so far as my own observation went—in the utterances of practical planners within government. This is the idea that nuclear war might be erroneously triggered, or erroneously widened, through a state under attack misreading either what sort of attack It was being subjected to, or where the attack came from. The postulated misreading of the nature of the attack referred in particular to the hypothesis that if a delivery system—normally a missile—that was known to he capable of carrying either a nuclear or a conventional warhead was launched in a conventional role, the target country might, on detecting the launch through its early. warning systems, misconstrue the mission as an imminent nuclear strike and immediately unleash a nuclear counter-strike of its own. This conecture was voiced, for example, as a criticism of the pro- lls (or giving the US Trident SL11M long associated with nuclear missions, a capability to deliver conventional warheads. Whatever the nwrit of those proposals (it Is not explored here), It is hard to regard this particular apprehension as having any real-life credibility. The flight time of a ballistic missile would not exceed about thirty minutes, and that of a cruise missile a few hours, before arrival on target made its character—conventional or nuclear—unmistakable. No government will need, and no non- lunatic government could wish, to take within so short a span of time a step as enormous and irrevocable as the execution of a nuclear strike on the basis of early-warning Information alone without knowing the true nature of the incoming attack. The speculation tends moreover to be expressed without reference either to any realistic political or conflict-related context thought to render the episode plausible, or to the manifest interest of the launching country, should there be any risk of doubt, in ensuring—by explicit communication if necessary—that there was no misinterpretation of its conventionally armed launch. It may he oblected to this analysis that in the cold war the two opposing superpowers had concepts of launch-on-warning. That seems to be true, at least in the sense that successive US administrations declined to rule out such an option and indeed included In their contingency plans Lxth this and the possibility of launch- under-attack (that is launch after some strikes had been suffered and while the sequence of them was evidently continuing). The Soviet Union was not likely to have had more relaxed practices. But the colossal gravity of activating any such arrangements must always have been recognized. It could have been contemplated only in circumstances where the entire political context made a pre-emptive attack by the adversary plainly a serious and imminent possibility. and where niowover the available information unmistakably mdi- cated that a massive assault with hundreds or thousands of missiles was on the way. That was a scenario wholly unlike that implicit in the supposition that a conventional missile attack might he briefly mIstaken for a nuclear one. The other sort of misunderstanding conjectured—that of misread- ing the source of attack—envisaged. typically. that SLBMs launched by France or the United Kingdom might erroneously be supposed to be coming from US submarines, and so might initiate a super- power exchange which the United States did not in fact intend. (An occasional variant on this was the notion that ‘triggering in this way might actually be an element in deliberate French or IlK deterrent concepts. There was never any truth in this guess in relation to the United Kingdom, and French thinking Is unlikely to have been different.) The unreality In this category of conlecture lay In the Implication that such a scenario could develop without the US government making the most determined efforts to ensure that Soviet (or now Rus.sian leaders knew that the United States was not responsible for the attack, and with those leaders for their part resorting, on unproven suspicion. to action that was virtually certain to provoke nuclear counter-action from the United States. There used occasion- ally to be another speculation, that if the Soviet Union suffered heavy nuclear strikes known to come from France or the United Kingdom, it might judge its interests to be best wrvcd by ensuring that the United States did not remain an unscathed bystander. But even if that were somehow thought marginally less implausible, it would have been a different matter from misinterpretauon of the initial strike. As was nOted earlier In this chapter, the arrangements under which nudear-weapon inventories arc now managed rc in several iniportant respects already mudi less open to concern than they were during much of the cold war. Worries voiced more recently sometimes relate to ‘cyher-attack’----hostile Interference, whether by states or by other actors such as terrorists, with Information systems used in the control of armouries. It is highly unlikely, though details are (again understandably) not made public, that regular reviews of control arrangements are oblivious to any such risks. Perceptions of them do however reinforce the already-strong case that whatever arrange. ments still remain in place for continuous high readiness to launch nuclear action at short notice should be abandoned. Chapter 13 returns to this.

#### No Solvency – storage cost barrier

Maryniak 12 [Gregg, Chairman of the Energy and Environmental Systems Track of Singularity University and the Secretary of the X PRIZE Foundation, “Storage, Not Generation, is the Challenge to Renewable Energy,” Forbes, http://www.forbes.com/sites/singularity/2012/07/20/storage-not-generation-is-the-challenge-to-renewable-energy/]

If solar and wind power are to break out of their present tiny niche positions, they will need to achieve systems parity with traditional energy supplies. This means that the cost of conversion plus the cost of storage will have to be similar to the cost of providing energy on demand from the energy stored in chemical or nuclear fuels. You can find some pretty shrill Internet rhetoric suggesting that the requirement for power on-demand (what the industry calls “baseload power”) is an irrelevant argument concocted by “renewables deniers.” But the reality is that many solar energy pioneers themselves say that solar power will be severely limited in market penetration, unless competent energy storage is developed. Our present fixation with energy generation ignores the “time value of energy.” Instead of concentrating all of our efforts on generation we need to pay increased attention to energy storage. Only after the cost of generation and storage of renewable energy matches the cost of on-demand generation from fossil, nuclear and hydro we will we see a transformation of the energy industry.

### Warming

#### Wind and solar are worse for the environment – necessity of backup power causes more emissions

Zycher 12 (Benjamin, Pacific Research Institute Senior Fellow, Martin V. Smith School of Business and Economics adjunct professor, associate in the Intelligence Community Associates Program of the Office of Economic Analysis, Bureau of Intelligence and Research, U.S. Department of State, former senior staff economist for the President's Council of Economic Advisers, April 19, “Zycher testimony to joint House subcommittee hearing on subsidies for renewable energy,” <http://www.aei.org/article/energy-and-the-environment/alternative-energy/zycher-testimony-to-joint-house-subcommittee-hearing-on-subsidies-for-renewable-energy/>, d/a 8-1-12, ads)

A cleaner environment is worth it, you say? Not so fast. As counterintuitive as it may seem, increased reliance on wind and solar power will hurt the environment, not because of such phony issues as endangered cockroaches, used by the environmental left as a tool with which to obstruct the renewable energy projects that they claim to support. Instead, this damage will be real, in the form of greater air pollution. The conventional generators needed to back up the unreliable wind and solar production will have to be cycled up and down because the system operators will be required to take wind and solar generation when it is available. This means greater operating inefficiency and more emissions. That is precisely what a recent engineering study of the effects of renewables requirements found for Colorado and Texas.¶ So we have achieved the perfect leftist trifecta: higher costs, lower reliability, and more environmental degradation. Such plagues are hardly biblical, but neither are they trivial. Will Governor Brown finally be content? Obviously not, as he now wants higher taxes to feed a Sacramento monster utterly destructive in so many dimensions.

#### Solar energy causes massive warming – emits highly virulent greenhouse gasses

Zehner 12 (Ozzie, University of California Berkeley Visiting Scholar, June 04, “Green Illusions: The Dirty Secrets Of Clean Energy,” <http://thegwpf.org/the-climate-record/5880-green-illusions-the-dirty-secrets-of-clean-energy-.html>, d/a 8-2-12, ads)

Hexafluoroethane has a global warming potential that is 12,000 times higher than CO2, according to the Intergovernmental Panel on Climate Change (IPCC). It is 100 percent manufactured by humans, and survives 10,000 years once released into the atmosphere. Nitrogen trifluoride is 17,000 times more virulent than CO2, and SF6, the most treacherous greenhouse gas, is over 23,000 times more threatening.¶ The solar photovoltaic industry is one of the fastest-growing emitters of these gases, which are now measurably accumulating within the earth's atmosphere according to the U.S. National Oceanic and Atmospheric Administration (NOAA). A NOAA study shows that atmospheric concentrations of SF6 have been rising exponentially. A paper published in the peer-reviewed journal Geophysical Research Letters documents that atmospheric NF3 levels have been rising 11 percent per year.¶ "If photovoltaic production grows, so will the associated side effects," claims Zehner. "Even worse, there's no evidence that solar cells offset fossil fuel use in the American context." Zehner explains that alternative energy subsidies keep retail electricity costs incrementally lower, which then spurs demand. "It's a boomerang effect," remarks Zehner. "The harder we throw alternative energy into the electrical grid, the harder demand comes back to hit us on the head. Historically, we've filled that demand by building more fossil fuel plants, not fewer."¶ Instead, Zehner advocates shifting to energy taxes and other conservation measures. He claims that even some of the most expensive options for dealing with CO2 would become cost competitive long before today's solar cell technologies.¶ "If limiting CO2 is our goal, we might be better off directing our time and resources to those options first; solar cells seem a wasteful and pricey strategy," says Zehner. "It is hard to conceive of a justification for extracting taxes from the working class to fund installations of Stone Age photovoltaic technologies high in the gold-rimmed suburbs of Arizona and California."¶ ¶ ¶

#### Warming inevitable – CO2 stays in the atmosphere for hundreds of years.

Hillman, Senior Fellow at the Policy Studies Institute, ‘7

[Mayer, The Suicidal Planet: How To Prevent Global Climate Catastrophe, p. 25-6]

The effects of climate change cannot quickly be reversed by reducing or even eliminating future emissions of greenhouse gases. There are two reasons for this. First, greenhouse gases released into the atmosphere linger for decades (in the case of relatively short-lived gases like methane), or hundreds of years (for carbon dioxide), or even thousands of years (for the long-lived gases like perfluorocarbons). Carbon dioxide and methane concentrations in the atmosphere are respectively one-third and more than twice as high as those at any time over the last 650,000 years. Even if no additional carbon dioxide were emitted from now on, atmospheric concentrations would take centuries to decline to pre-Industrial Revolution levels. While elevated levels of greenhouse gases remain in the atmosphere, additional warming will occur.

#### No international spillover – subsidies only reduce the domestic cost of producing renewable energy, no reason renewables would be economical globally.

#### Climate leadership on reducing emissions in the status quo

Roberts 12 (David Roberts is a staff writer for Grist, writing about Energy, politics, and more, July 17th, U.S. leads the world in cutting CO2 emissions — so why aren’t we talking about it?, http://grist.org/climate-policy/u-s-leads-the-world-in-cutting-co2-emissions-so-why-arent-we-talking-about-it/)

Contrary to popular belief, the U.S. is making progress on climate change.¶ We have cut our carbon emissions more than any other country in the world in recent years — 7.7 percent since 2006. U.S. emissions fell 1.9 percent last year and are projected to fall 1.9 percent again this year, which will put us back at 1996 levels. It will not be easy to achieve the reductions Obama promised in Copenhagen — 17 percent (from 2005 levels) by 2020 — but that goal no longer looks out of reach, even in the absence of comprehensive legislation.

#### China produces more emissions than every other country – outweighs the US

Koetzle, Ph.D. and Senior Vice President of Public Policy at the Institute for Energy Research, ‘8

[William, "IER Rebuttal to Boucher White Paper", http://www.instituteforenergyresearch.org/2008/04/13/ier-rebuttal-to-boucher-white-paper/]

Take for example the following chart from the Energy Information Agency (EIA).[[6]](http://www.instituteforenergyresearch.org/2008/04/13/ier-rebuttal-to-boucher-white-paper/#_ftn6) This chart presents a detailed view of current and projected world energy-related CO2 emissions (1990 to 2030). This chart shows that in 2004, the United States accounted for approximately 22% of world CO2 emissions. By 2030, the EIA estimates that the United States’ share of these emissions will fall to about 18.5%. It also shows where the increases in CO2 emissions will occur over the next two decades: in the developing (i.e. non-OECD) countries. Currently energy-related CO2 emissions are roughly equivalent between OECD (developed) and non-OECD countries; by 2030 this ratio will change: Developed countries will be responsible for less than 40% of emissions. Notice specifically that China’s and India’s CO2 emissions are estimated to increase by 139% and 94% respectively. As the Committee White Paper notes, several states and regions have acted in the absence of federal legislation to enact GHG reduction programs. California, for example, passed AB 32 which establishes a goal of reducing emissions to 25% below 1990 levels by 2020. California currently accounts for about 6.7% of total United States emissions[[7]](http://www.instituteforenergyresearch.org/2008/04/13/ier-rebuttal-to-boucher-white-paper/" \l "_ftn7" \o "_ftnref7); and about 1.5% of world-wide energy-related CO2 emissions. If California were successful in achieving this very significant reduction in emissions, how would this impact net global CO2 emissions? The answer is not much. California’s reduction by 2030 would reduce the growth in United States emissions by about 13%; and the reduction would only offset about 4% of China’s increase in emissions over the same period. This table also helps to illustrate what happens to global net CO2 emissions, given reduction scenarios undertaken by an individual nation or a group of nations. For example, if the United States were to unilaterally reduced emissions by 30% or 40% below 2004 levels[[8]](http://www.instituteforenergyresearch.org/2008/04/13/ier-rebuttal-to-boucher-white-paper/" \l "_ftn8" \o "_ftnref8) by 2030; net global CO2 emissions would still increase by more than 40%. The reason is straightforward: either of these reduction levels is offset by the increases in CO2 emissions in developing countries. For example, a 30% cut below 2004 levels by 2030 by the United States offsets less than 60% of China’s increase in emissions during the same period. In fact, even if the United States were to eliminate all CO2 emissions by 2030, without any corresponding actions by other countries, world-wide emissions would still increase by 30%. If the United States were joined by the other OECD countries in a CO2 reduction effort, net emissions would still significantly increase. In the event of an OCED-wide reduction of 30%, global emissions increase by 33%; a reduction of 40% still leads to a net increase of just under 30%. Simply put, in order to hold CO2 emissions at 2004 levels, absent any reductions by developing nations like China and India, all OECD emissions would have to cease.[[9]](http://www.instituteforenergyresearch.org/2008/04/13/ier-rebuttal-to-boucher-white-paper/#_ftn9)

#### Oceans and marine bioD are resilient – alarmist predictions empirically denied

Taylor 10 [James M. Taylor is a senior fellow of The Heartland Institute and managing editor of Environment & Climate News., “Ocean Acidification Scare Pushed at Copenhagen,” Feb 10 http://www.heartland.org/publications/environment%20climate/article/26815/Ocean\_Acidification\_Scare\_Pushed\_at\_Copenhagen.html]

With global temperatures continuing their decade-long decline and United Nations-sponsored global warming talks falling apart in Copenhagen, alarmists at the U.N. talks spent considerable time claiming carbon dioxide emissions will cause catastrophic ocean acidification, regardless of whether temperatures rise. The latest scientific data, however, show no such catastrophe is likely to occur. Food Supply Risk Claimed The United Kingdom’s environment secretary, Hilary Benn, initiated the Copenhagen ocean scare with a high-profile speech and numerous media interviews claiming ocean acidification threatens the world’s food supply. “The fact is our seas absorb CO2. They absorb about a quarter of the total that we produce, but it is making our seas more acidic,” said Benn in his speech. “If this continues as a problem, then it can affect the one billion people who depend on fish as their principle source of protein, and we have to feed another 2½ to 3 billion people over the next 40 to 50 years.” Benn’s claim of oceans becoming “more acidic” is misleading, however. Water with a pH of 7.0 is considered neutral. pH values lower than 7.0 are considered acidic, while those higher than 7.0 are considered alkaline. The world’s oceans have a pH of 8.1, making them alkaline, not acidic. Increasing carbon dioxide concentrations would make the oceans less alkaline but not acidic. Since human industrial activity first began emitting carbon dioxide into the atmosphere a little more than 200 years ago, the pH of the oceans has fallen merely 0.1, from 8.2 to 8.1. Following Benn’s December 14 speech and public relations efforts, most of the world’s major media outlets produced stories claiming ocean acidification is threatening the world’s marine life. An Associated Press headline, for example, went so far as to call ocean acidification the “evil twin” of climate change. Studies Show CO2 Benefits Numerous recent scientific studies show higher carbon dioxide levels in the world’s oceans have the same beneficial effect on marine life as higher levels of atmospheric carbon dioxide have on terrestrial plant life. In a 2005 study published in the Journal of Geophysical Research, scientists examined trends in chlorophyll concentrations, critical building blocks in the oceanic food chain. The French and American scientists reported “an overall increase of the world ocean average chlorophyll concentration by about 22 percent” during the prior two decades of increasing carbon dioxide concentrations. In a 2006 study published in Global Change Biology, scientists observed higher CO2 levels are correlated with better growth conditions for oceanic life. The highest CO2 concentrations produced “higher growth rates and biomass yields” than the lower CO2 conditions. Higher CO2 levels may well fuel “subsequent primary production, phytoplankton blooms, and sustaining oceanic food-webs,” the study concluded. Ocean Life ‘Surprisingly Resilient’ In a 2008 study published in Biogeosciences, scientists subjected marine organisms to varying concentrations of CO2, including abrupt changes of CO2 concentration. The ecosystems were “surprisingly resilient” to changes in atmospheric CO2, and “the ecosystem composition, bacterial and phytoplankton abundances and productivity, grazing rates and total grazer abundance and reproduction were not significantly affected by CO2-induced effects.” In a 2009 study published in Proceedings of the National Academy of Sciences, scientists reported, “Sea star growth and feeding rates increased with water temperature from 5ºC to 21ºC. A doubling of current [CO2] also increased growth rates both with and without a concurrent temperature increase from 12ºC to 15ºC.” Another False CO2 Scare “Far too many predictions of CO2-induced catastrophes are treated by alarmists as sure to occur, when real-world observations show these doomsday scenarios to be highly unlikely or even virtual impossibilities,” said Craig Idso, Ph.D., author of the 2009 book CO2, Global Warming and Coral Reefs. “The phenomenon of CO2-induced ocean acidification appears to be no different.

#### No recession now – Best indicators prove risk of recession is 0.20%

Perry 13 [Mark, Chart of the day: US recession probability is down to 0.20%, AEIdeas, The public policy blog of the American Enterprise Institute, http://www.aei-ideas.org/2013/02/chart-of-the-day-us-recession-probability-is-down-to-0-20/]

The chart above shows University of Oregon economics professor Jeremy Piger’s “Recession Probability Index” from January 1990 to November 2012, based on the 4 monthly variables used by the NBER to determine U.S. recessions: 1) non-farm payroll employment, 2) the index of industrial production, 3) real personal income excluding transfer payments, and 4) real manufacturing and trade sales.¶ According to Professor Piger, “Historically, three consecutive months of recession probabilities exceeding 0.8 (see graph) has been a good indicator that an expansion phase has ended and a new recession phase has begun, while three consecutive months of recession probabilities below 0.2 has been a good indicator that a recession phase has ended and a new expansion phase has begun.”¶ Based on an update yesterday, the Recession Probability Index has been trending downward for the last three months and fell to 0.20% in November, the lowest level since June and July when the probability was also 0.20%. Based on this historically accurate measure of the probability of a US recession, the US economy is not even close to being in the early stages of an economic contraction.

### Water

#### Supply of water is not the problem.

Radford 8

[Benjamin, Writer for Skeptical Inquirer, “The Water Shortage Myth”, 6-23, <http://www.livescience.com/environment/080623-bad-water-shortage.html>]

Our planet is not running out of water, nor is it losing water. There's about 360 quintillion gallons of water on the planet, and it's not going anywhere except in a circle. Earth's hydrologic cycle is a closed system, and the process is as old as time: evaporation, condensation, precipitation, infiltration, and so on. In fact, there is probably more liquid water on Earth than there was just a few decades *ago*, due in part to global warming and melting polar ice caps.The problemsNo, there is plenty of water. The problem is that the vast majority of Earth's water is contained in the oceans as saltwater, and must be desalinated before it can be used for drinking or farming.Large-scale desalination can be done, but it is expensive. But nor is the world running out of freshwater, either. There's plenty of freshwater on our blue globe; it is not raining any less these days than it did millennia ago. As with any other resource, there are of course regional shortages, and they are getting worse. But the real problems areavailability and transport; moving the freshwater from where it is plentiful (such as Canada, South America, and Russia) to where it is scarce (such as the Middle East, India, and Africa). Water is heavy and costly to transport, and those who can afford it will always have water.Water, not global warming, is likely to be the greatest environmental challenge facing the world in the coming decades and centuries.To find solutions, it's important to understand the problem. Water is never really "wasted." It simply moves from one place to another. If you let your faucet drip all day, that's clean water going back into the system, the water isn't "lost." What is lost is usefulness, money, and energy, because it takes energy to purify and distribute the water.

#### No impact to loss of biodiversity – empirically proven.

**Lomborg**, Director of the Copenhagen Consensus Center, **‘1**

[Bjorn, “The Skeptical Environmentalist: Measuring the Real State of the World”,

<http://www.warwickhughes.com/climate/lomborg2.htm>]

Third, that threat of biodiversity loss is real, but exaggerated. Most early estimates used simple island models that linked a loss in habitat with a loss of biodiversity. A rule-of-thumb indicated that loss of 90% of forest meant a 50% loss of species. As rainforests seemed to be cut at alarming rates, estimates of annual species loss of 20,000-100,000 abounded. Many people expected the number of species to fall by half globally within a generation or two. However, the data simply does not bear out these predictions. In the eastern United States, forests were reduced over two centuries to fragments totalling just 1-2% of their original area, yet this resulted in the extinction of only one forest bird. In Puerto Rico, the primary forest area has been reduced over the past 400 years by 99%, yet “only” seven of 60 species of bird has become extinct. All but 12% of the Brazilian Atlantic rainforest was cleared in the 19th century, leaving only scattered fragments. According to the rule-of-thumb, half of all its species should have become extinct. Yet, when the World Conservation Union and the Brazilian Society of Zoology analysed all 291 known Atlantic forest animals, none could be declared extinct. Species, therefore, seem more resilient than expected. And tropical forests are not lost at annual rates of 2-4%, as many environmentalists have claimed: the latest UN figures indicate a loss of less than 0.5%.

#### Renewables aren’t key to preventing an Ogallala water crisis. Agriculture and drought are the biggest culprits in aquifer depletion, there are several other alt causes for US water shortages, and water shortages are inevitable. Conservation is not enough—aquifer recharge is too slow, and we can only save so much.

ETF Daily News 3/4 [“30 Reasons A Global Water Crisis is Approaching,” http://etfdailynews.com/2013/03/04/30-reasons-a-global-water-crisis-is-approaching/]

We are also depleting our groundwater at a very frightening pace as a recent Science Daily article discussed… Three results of the new study are particularly striking: First, during the most recent drought in California’s Central Valley, from 2006 to 2009, farmers in the south depleted enough groundwater to fill the nation’s largest human-made reservoir, Lake Mead near Las Vegas — a level of groundwater depletion that is unsustainable at current recharge rates. Second, a third of the groundwater depletion in the High Plains occurs in just 4% of the land area. And third, the researchers project that if current trends continue some parts of the southern High Plains that currently support irrigated agriculture, mostly in the Texas Panhandle and western Kansas, will be unable to do so within a few decades. In the United States we have massive underground aquifers that have allowed our nation to be the breadbasket of the world. But once the water from those aquifers is gone, it is gone for good. That is why what is happening to the Ogallala Aquifer is so alarming. The Ogallala Aquifer is one of the largest sources of fresh water in the world, and U.S. farmers use water from it to irrigate more than 15 million acres of crops each year. The Ogallala Aquifer covers more than 100,000 square miles and it sits underneath the states of Texas, New Mexico, Oklahoma, Colorado, Kansas, Nebraska, Wyoming and South Dakota. Most Americans have never even heard of it, but it is absolutely crucial to our way of life. Sadly, it is being drained at a rate that is almost unimaginable. The following are some facts about the Ogallala Aquifer and the growing water crisis that we are facing in the United States. A number of these facts were taken from one of my previous articles. I think that you will agree that many of these facts are quite alarming… 1. The Ogallala Aquifer is being drained at a rate of approximately 800 gallons per minute. 2. According to the U.S. Geological Survey, “a volume equivalent to two-thirds of the water in Lake Erie” has been permanently drained from the Ogallala Aquifer since 1940. 3. Decades ago, the Ogallala Aquifer had an average depth of approximately 240 feet, but today the average depth is just 80 feet. In some areas of Texas, the water is gone completely. 4. Scientists are warning that nothing can be done to stop the depletion of the Ogallala Aquifer. The ominous words of David Brauer of the Ogallala Research Service should alarm us all… “Our goal now is to engineer a soft landing. That’s all we can do.” 5. According to a recent National Geographic article, the average depletion rate of the Ogallala Aquifer is picking up speed…. Even more worrisome, the draining of the High Plains water account has picked up speed. The average annual depletion rate between 2000 and 2007 was more than twice that during the previous fifty years. The depletion is most severe in the southern portion of the aquifer, especially in Texas, where the water table beneath sizeable areas has dropped 100-150 feet; in smaller pockets, it has dropped more than 150 feet. 6. According to the U.S. National Academy of Sciences, the U.S. interior west is now the driest that it has been in 500 years. 7. Wildfires have burned millions of acres of vegetation in the central part of the United States in recent years. For example, wildfires burned an astounding 3.6 million acres in the state of Texas alone during 2011. This helps set the stage for huge dust storms in the future. 8. Unfortunately, scientists tell us that it would be normal for extremely dry conditions to persist in parts of western North America for decades. The following is from an article in the Vancouver Sun… But University of Regina paleoclimatologist Jeannine-Marie St. Jacques says that decade-long drought is nowhere near as bad as it can get. St. Jacques and her colleagues have been studying tree ring data and, at the American Association for the Advancement of Science conference in Vancouver over the weekend, she explained the reality of droughts. “What we’re seeing in the climate records is these megadroughts, and they don’t last a decade—they last 20 years, 30 years, maybe 60 years, and they’ll be semi-continental in expanse,” she told the Regina Leader-Post by phone from Vancouver. “So it’s like what we saw in the Dirty Thirties, but imagine the Dirty Thirties going on for 30 years. That’s what scares those of us who are in the community studying this data pool.” 9. Experts tell us that U.S. water bills are likely to soar in the coming years. It is being projected that repairing and expanding our decaying drinking water infrastructure will cost more than one trillion dollars over the next 25 years, and as a result our water bills will likely approximately triple over that time period. 10. Right now, the United States uses approximately 148 trillion gallons of fresh water a year, and there is no way that is sustainable in the long run. 11. According to a U.S. government report, 36 states are already facing water shortages or will be facing water shortages within the next few years. 12. Lake Mead supplies about 85 percent of the water to Las Vegas, and since 1998 the level of water in Lake Mead has dropped by about 5.6 trillion gallons. 13. It has been estimated that the state of California only has a 20 year supply of fresh water left. 14. It has been estimated that the state of New Mexico only has a 10 year supply of fresh water left. 15. Approximately 40 percent of all rivers in the United States and approximately 46 percent of all lakes in the United States have become so polluted that they are are no longer fit for human use. The 1,450 mile long Colorado River is a good example of what we have done to our precious water supplies. It is probably the most important body of water in the southwestern United States, and it is rapidly dying. The following is an excerpt from an outstanding article by Jonathan Waterman about how the once mighty Colorado River is rapidly drying up… Fifty miles from the sea, 1.5 miles south of the Mexican border, I saw a river evaporate into a scum of phosphates and discarded water bottles. This dirty water sent me home with feet so badly infected that I couldn’t walk for a week. And a delta once renowned for its wildlife and wetlands is now all but part of the surrounding and parched Sonoran Desert. According to Mexican scientists whom I met with, the river has not flowed to the sea since 1998. If the Endangered Species Act had any teeth in Mexico, we might have a chance to save the giant sea bass (totoaba), clams, the Sea of Cortez shrimp fishery that depends upon freshwater returns, and dozens of bird species. So let this stand as an open invitation to the former Secretary of the Interior and all water buffalos who insist upon telling us that there is no scarcity of water here or in the Mexican Delta. Leave the sprinklered green lawns outside the Aspen conferences, come with me, and I’ll show you a Colorado River running dry from its headwaters to the sea. It is polluted and compromised by industry and agriculture. It is overallocated, drought stricken, and soon to suffer greatly from population growth. If other leaders in our administration continue the whitewash, the scarcity of knowledge and lack of conservation measures will cripple a western civilization built upon water.

## 2NC

### CP

#### DoD acquisition of SMR’s ensures rapid military adoption, commercialization, and U.S. leadership

Andres and Breetz 11

[Richard (Professor of National Security Strategy at the National War College and a Senior Fellow and Energy and Environmental Security and Policy Chair in the Center for Strategic Research, Institute for National Strategic Studies, at the National Defense University) and Hanna (doctoral candidate in the Department of Political Science at The Massachusetts Institute of Technology), Small Nuclear Reactorsfor Military Installations:Capabilities, Costs, andTechnological Implications, [www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf](http://www.ndu.edu/press/lib/pdf/StrForum/SF-262.pdf)]

Thus far, this paper has reviewed two of DOD’s most pressing energy vulnerabilities—grid insecurity and fuel convoys—and explored how they could be addressed by small reactors. We acknowledge that there are many uncertainties and risks associated with these reactors. On the other hand, failing to pursue these technologies raises its own set of risks for DOD, which we review in this section: first, small reactors may fail to be commercialized in the United States; second, the designs that get locked in by the private market may not be optimal for DOD’s needs; and third, expertise on small reactors may become concentrated in foreign countries. By taking an early “first mover” role in the small reactor market, DOD could mitigate these risks and secure the long-term availability and appropriateness of these technologies for U.S. military applications. The “Valley of Death.” Given the promise that small reactors hold for military installations and mobility, DOD has a compelling interest in ensuring that they make the leap from paper to production. However, if DOD does not provide an initial demonstration and market, there is a chance that the U.S. small reactor industry may never get off the ground. The leap from the laboratory to the marketplace is so difficult to bridge that it is widely referred to as the “Valley of Death.” Many promising technologies are never commercialized due to a variety of market failures— including technical and financial uncertainties, information asymmetries, capital market imperfections, transaction costs, and environmental and security externalities— that impede financing and early adoption and can lock innovative technologies out of the marketplace. 28 In such cases, the Government can help a worthy technology to bridge the Valley of Death by accepting the first mover costs and demonstrating the technology’s scientific and economic viability.29 [FOOTNOTE 29: There are numerous actions that the Federal Government could take, such as conducting or funding research and development, stimulating private investment, demonstrating technology, mandating adoption, and guaranteeing markets. Military procurement is thus only one option, but it has often played a decisive role in technology development and is likely to be the catalyst for the U.S. small reactor industry. See Vernon W. Ruttan, Is War Necessary for Economic Growth? (New York: Oxford University Press, 2006); Kira R. Fabrizio and David C. Mowery, “The Federal Role in Financing Major Inventions: Information Technology during the Postwar Period,” in Financing Innovation in the United States, 1870 to the Present, ed. Naomi R. Lamoreaux and Kenneth L. Sokoloff (Cambridge, MA: The MIT Press, 2007), 283–316.] Historically, nuclear power has been “the most clear-cut example . . . of an important general-purpose technology that in the absence of military and defense related procurement would not have been developed at all.”30 Government involvement is likely to be crucial for innovative, next-generation nuclear technology as well. Despite the widespread revival of interest in nuclear energy, Daniel Ingersoll has argued that radically innovative designs face an uphill battle, as “the high capital cost of nuclear plants and the painful lessons learned during the first nuclear era have created a prevailing fear of first-of-a-kind designs.”31 In addition, Massachusetts Institute of Technology reports on the Future of Nuclear Power called for the Government to provide modest “first mover” assistance to the private sector due to several barriers that have hindered the nuclear renaissance, such as securing high up-front costs of site-banking, gaining NRC certification for new technologies, and demonstrating technical viability.32 It is possible, of course, that small reactors will achieve commercialization without DOD assistance. As discussed above, they have garnered increasing attention in the energy community. Several analysts have even argued that small reactors could play a key role in the second nuclear era, given that they may be the only reactors within the means of many U.S. utilities and developing countries.33 However, given the tremendous regulatory hurdles and technical and financial uncertainties, it appears far from certain that the U.S. small reactor industry will take off. If DOD wants to ensure that small reactors are available in the future, then it should pursue a leadership role now. Technological Lock-in. A second risk is that if small reactors do reach the market without DOD assistance, the designs that succeed may not be optimal for DOD’s applications. Due to a variety of positive feedback and increasing returns to adoption (including demonstration effects, technological interdependence, network and learning effects, and economies of scale), the designs that are initially developed can become “locked in.”34 Competing designs—even if they are superior in some respects or better for certain market segments— can face barriers to entry that lock them out of the market. If DOD wants to ensure that its preferred designs are not locked out, then it should take a first mover role on small reactors. It is far too early to gauge whether the private market and DOD have aligned interests in reactor designs. On one hand, Matthew Bunn and Martin Malin argue that what the world needs is cheaper, safer, more secure, and more proliferation-resistant nuclear reactors; presumably, many of the same broad qualities would be favored by DOD.35 There are many varied market niches that could be filled by small reactors, because there are many different applications and settings in which they can be used, and it is quite possible that some of those niches will be compatible with DOD’s interests.36 On the other hand, DOD may have specific needs (transportability, for instance) that would not be a high priority for any other market segment. Moreover, while DOD has unique technical and organizational capabilities that could enable it to pursue more radically innovative reactor lines, DOE has indicated that it will focus its initial small reactor deployment efforts on LWR designs.37 If DOD wants to ensure that its preferred reactors are developed and available in the future, it should take a leadership role now. Taking a first mover role does not necessarily mean that DOD would be “picking a winner” among small reactors, as the market will probably pursue multiple types of small reactors. Nevertheless, DOD leadership would likely have a profound effect on the industry’s timeline and trajectory. Domestic Nuclear Expertise. From the perspective of larger national security issues, if DOD does not catalyze the small reactor industry, there is a risk that expertise in small reactors could become dominated by foreign companies. A 2008 Defense Intelligence Agency report warned that the United States will become totally dependent on foreign governments for future commercial nuclear power unless the military acts as the prime mover to reinvigorate this critical energy technology with small, distributed power reactors.38 Several of the most prominent small reactor concepts rely on technologies perfected at Federally funded laboratories and research programs, including the Hyperion Power Module (Los Alamos National Laboratory), NuScale (DOE-sponsored research at Oregon State University), IRIS (initiated as a DOE-sponsored project), Small and Transportable Reactor (Lawrence Livermore National Laboratory), and Small, Sealed, Transportable, Autonomous Reactor (developed by a team including the Argonne, Lawrence Livermore, and Los Alamos National Laboratories). However, there are scores of competing designs under development from over a dozen countries. If DOD does not act early to support the U.S. small reactor industry, there is a chance that the industry could be dominated by foreign companies. Along with other negative consequences, the decline of the U.S. nuclear industry decreases the NRC’s influence on the technology that supplies the world’s rapidly expanding demand for nuclear energy. Unless U.S. companies begin to retake global market share, in coming decades France, China, South Korea, and Russia will dictate standards on nuclear reactor reliability, performance, and proliferation resistance.

#### DoD development shortens licensing process.

Butler, Lt. Col., ‘11

[Glen, “Not Green Enough”,

[www.mca-marines.org/gazette/not-green-enough](http://www.mca-marines.org/gazette/not-green-enough)]

SMRs have relatively low plant cost, can replace aging fossil plants, and do not emit greenhouse gasses. Some are as small as a “hot tub” and can be stored underground, dramatically increasing safety and security from terrorist threats.25 Encouragingly, in fiscal year 2010 (FY10) the DoE allocated $0 to the U.S. SMR Program; in FY11, they’ve requested $38.9 million. This funding is to support two main activities—public/private partnerships to advance SMR designs and research and development and demonstrations. According to the DoE’s website, one of the planned program accomplishments for FY11 is to “collaborate with the Department of Defense (DoD) . . . to assess the feasibility of SMR designs for energy resources at DoD installations.”26 The Marine Corps should vigorously seek the opportunity to be a DoD entity providing one platform for this feasibility assessment.27 Fourth, SMR technology offers the Marine Corps another unique means to lead from the front—not just of the other Services but also of the Nation, and even the world.28 This potential Pete Ellis moment should be seized. There are simple steps we could take, and others stand ready to lead if we are not.30 But the temptation to “wait and see” and “let the others do it; then we’ll adopt it” mentality is not always best. Energy security demands boldness, not timidity. To be fair, nuclear technology comes with challenges, of course, and with questions that have been kicked around for decades. An April 1990 Popular Science article asked, “Next Generation Nuclear Reactors—Dare we build them?” and included some of the same verbiage heard in similar discussions today.31 Compliance with National Environment Policy Act requirements necessitates lengthy and detailed preaction analyses, critical community support must be earned, and disposal challenges remain. Still, none of these hurdles are insurmountable. Yet despite the advances in safety, security, and efficiency in recent years, nuclear in the energy equation remains the new “n-word” for most military circles. And despite the fact that the FY10 National Defense Authorization Act called on the DoD to “conduct a study [of] the feasibility of nuclear plants on military installations,” the Office of the Secretary of Defense has yet to fund the study. Fifth, the cumbersome, bureaucratic certification process of the Nuclear Regulatory Commission (NRC), often enough to scare away potential entrepreneurs and investors, is not necessarily a roadblock to success. The NRC is “responsible for licensing and regulating the operation of commercial nuclear power plants in the United States.” Military installations offer unique platforms that could likely bypass an extended certification process. With established expertise and a long safety record in nuclear reactor certification, operations, training, and maintenance, the Naval Nuclear Propulsion Program comprises the civilian and military personnel who: . . . design, build, operate, maintain, and manage the nuclear-powered ships and the many facilities that support the U.S. nuclear-powered naval fleet.”34 Bypassing the NRC and initiating SMR experimentation under ADM Hyman Rickover’s legacy umbrella of naval reactors could shorten the process to a reasonable level for Marine and naval installations.35

#### Most qualified ev goes neg.

Hunt 11

(Gary, President, Tech&Creative Labs, a disruptive innovation business collaboration of software, data and advanced analytics technology companies working together to integrate their products to meet the changing needs of the energy vertical. Tech and Creative Labs is based in Boston with offices in the San Francisco Bay Area. Gary Hunt has more than 30 years experience in the energy, software and information technology industries. He served as VP-Global Analytics & Data at IHS/CERA; Division President, Ventyx/Global Energy Advisors; as CEO, MMWEC, a New England-based wholesale power producer, “Is there a Small Modular Nuke in our Distributed Energy Future?” May 31, 2011, http://www.tclabz.com/2011/05/31/is-there-a-small-modular-nuke-in-our-distributed-energy-future/)

The Colonel says the military does not believe the NRC will license such a modular design anytime soon enough to meet the military need so he is recommending that the Department of Defense use its authority to license such technology for military purposes since doing so does not require NRC approval. Once proven and deployed, these military applications should speed the path to small modular nuclear units in civilian applications.

#### We can build them really quickly.

Blees et al 11

[Tom Blees1, Yoon Chang2, Robert Serafin3, Jerry Peterson4, Joe Shuster1, Charles Archambeau5, Randolph Ware3, 6, Tom Wigley3,7, Barry W. Brook7, 1Science Council for Global Initiatives, 2Argonne National Laboratory, 3National Center for Atmospheric Research, 4University of Colorado, 5Technology Research Associates, 6Cooperative Institute for Research in the Environmental Sciences, 7(climate professor) University of Adelaide, "Advanced nuclear power systems to mitigate climate change (Part III)," 2/24/11) http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/-http://bravenewclimate.com/2011/02/24/advanced-nuclear-power-systems-to-mitigate-climate-change/]

How Fast Can We Build Them?¶ During France’s nuclear building boom they built an average of six nuclear power plants per year, culminating in a situation that provides them with about 80% of their electrical needs while making electricity their fourth-largest export earner. Gross Domestic Product (GDP) can be used as a rough guide to what a given country can financially bear for such a project, keeping in mind that France proceeded without the sense of urgency that the world today should certainly be ready to muster. There are six countries with higher GDPs than France, all of whom already possess the technology to build fast reactors: USA, China, Japan, India (they’re building one now), Germany, and the United Kingdom. Add Canada and Russia (which already has a commercial fast reactor running and is planning more), then tally up the GDP of these eight countries. At the rate of 6 plants per year (~ 1GW each) at the equivalent of France’s GDP, these countries alone could afford to build about 117 power plants per year, even without any greater urgency than the French brought to bear on their road to energy independence.¶ Consider that there are about 400 nuclear power plants in the world today. At this entirely feasible rate of construction we could more than double the planet’s nuclear capacity in just four years. Remember, the French accomplished their transformation with non-modular, albeit standardized, Gen II designs. Modular construction, passive safety systems, and factory fabrication, divided among companies all over the planet, could realistically convert the planet’s electricity production to virtually all nuclear in a couple decades, with abundant surplus electricity for ancillary uses such as desalination and the production of liquid fuels such as ammonia.

### warm

#### no wind and solar now

Battaglia 3/12 (Sarah, http://www.energyblogs.com/YourEnergyBlog/index.cfm/2013/3/12/Sequester-Cuts-Could-Hinder-Growth-of-Energy-Industry)

Secretary of Energy Steven Chu explained to a U.S. Senate committee how the sequestration could potentially affect the energy sector, “Under sequestration, funding reductions would decelerate the nation’s transition into a clean energy economy, and could weaken efforts to become more energy independent and energy secure.”¶ Oil and gas projects are one area that will most likely feel the weight of the sequester. Outgoing Interior Secretary Ken Salazar predicts that about 300 onshore oil and gas leases will be delayed in western states, as well as nearly 550 offshore projects in the Gulf of Mexico.¶ According to a report from the White House, the nation will certainly feel the repercussions of cuts to environmental funding. The National Science Foundation will be required to cut about 1,000 research grants and awards which fund nearly 12,000 students and scientists for scientific development, including research directly related to climate change.¶ Clean energy development is also among the areas facing potentially large cutbacks. “Automatic budget cuts implemented per the sequester threatens the ability of the Department to plan for and issue permits for new development projects, conduct environmental reviews, and lease new federal lands for future development,” stated Salazar. Chu agreed that these cuts “would also hinder U.S. innovation as global markets for solar energy continue to grow rapidly and become more competitive.” Unfortunately, wind and solar plants on federal land are two entities that may not develop as quickly as many predicted.¶ Other energy areas that can expect to be affected by the sequester include Hurricane Sandy relief efforts (as well as funding to other FEMA projects), studies that turn public land into clean energy zones, offshore wind energy development, and efforts that will regulate the fracking industry,

#### Solar causes NF3 increases – that causes extreme warming

Conniff 8 (Richard, Guggenheim fellow, National Magazine Award-winning writer, has written for Yale e360 about [carbon offsets](http://e360.yale.edu/content/feature.msp?id=2067) and clean coal, November 13, “The Greenhouse Gas That Nobody Knew,” <http://e360.yale.edu/content/feature.msp?id=2085>, d/a 8-2-12, ads)

When industry began using NF3 in high-tech manufacturing, it was hailed as a way to fight global warming. But new research shows that this gas has 17,000 times the warming potential of carbon dioxide and is rapidly increasing in the atmosphere – and that's turning an environmental success story into a public relations disaster.¶ Hypothetical question: You’re heartsick about global warming, so you’ve just paid $25,000 to put a solar system on the roof of your home. How do you respond to news that it was manufactured with a chemical that is 17,000 times stronger than carbon dioxide as a cause of global warming? It may sound like somebody’s idea of a bad joke. But last month, a study from the Scripps Institution of Oceanography reported that nitrogen trifluoride (NF3), with a global warming potential of 17,000, is now present in the atmosphere at four times the expected level and rapidly rising. Use of NF3 is currently booming, for products from computer chips and flats-screen LCDs to thin-film solar photovoltaics, an economical and increasingly popular solar power format. Moreover, the Kyoto Protocol, which limits a half-dozen greenhouse gases, does not cover NF3. The United Nations Framework Convention on Climate Change now lists it among five major new greenhouse gases likely to be included in the next phase of global warming regulation, after 2012. And while that may be reassuring, it also suggests the complicated character of the global warming problem.¶

#### NF3 stays in the atmosphere for over 500 years

Conniff 8 (Richard, Guggenheim Fellow, National Magazine Award-winning writer, has written for Yale e360 about [carbon offsets](http://e360.yale.edu/content/feature.msp?id=2067) and clean coal, November 13, “The Greenhouse Gas That Nobody Knew,” <http://e360.yale.edu/content/feature.msp?id=2085>, d/a 8-2-12, ads)

To tear apart that layer of crud and clean the vacuum chamber, manufacturers were using powerful fluorinated greenhouse gases. The usual choice, hexafluorethane, or C2F6 sounds better at first than NF3. In global warming terms, it’s only about 12,000 times worse than carbon dioxide. But C2F6 is difficult to break down, and roughly 60 percent of what goes into the vacuum chamber ends up in the atmosphere. With NF3, estimates suggested that under optimal conditions, roughly 98 percent of what goes into the vacuum chamber is destroyed there. So when the semiconductor industry announced a voluntary partnership with the EPA to reduce greenhouse-gas emissions by 10 percent from 1995 levels between 1999 and 2010, NF3 became the replacement technology of choice. Makers of flat-screen displays soon announced a similar program. In 2002, the EPA gave a Climate Protection Award to the largest NF3 producer, Pennsylvania-based Air Products and Chemicals Inc., for its work in reducing emissions. Then last summer, a paper calling NF3 “the greenhouse gas missing from Kyoto” attracted widespread press attention. Co-authors Michael J. Prather and Juno Hsu of the University of California at Irvine noted that NF3 is one of the most potent greenhouse gases known and persists in the atmosphere for 550 years.¶

#### Countermeasures don’t solve – company’s don’t regulate NF3 efficiently

Conniff 8 (Richard, Guggenheim Fellow, National Magazine Award-winning writer, has written for Yale e360 about [carbon offsets](http://e360.yale.edu/content/feature.msp?id=2067) and clean coal, November 13, “The Greenhouse Gas That Nobody Knew,” <http://e360.yale.edu/content/feature.msp?id=2085>, d/a 8-2-12, ads)

Moreover, even the latest equipment does not guarantee that a company will achieve the optimal emissions rates — for instance, in the solar cell industry. Amorphous silicon thin-film solar photovoltaic cells, manufactured using NF3, are slightly less efficient than crystalline silicon solar cells, the dominant technology. But they are cheaper to produce and expected to supply a rapidly increasing share of the solar market, for both large-scale and domestic applications. Because thin-film is a new technology, manufacturers generally use the latest equipment. But a knowledgeable source, who asked to remain unidentified, recently visited thin-film solar researchers in Asia. “They were unaware of the NF3 issue. They were using a remote plasma, but they were also using quite a bit of NF3. They weren’t sure they had it set up right for 98 percent destruction. It wasn’t really on their radar.” The bottom line, said UC Irvine’s Prather, is that “industry really cannot be trusted for self-regulation.” We will not know the extent of the problem “until we have honest, legally required reporting.” The other important lesson from the NF3 case, according to Scripps’s Weiss, is that the bottom-up measurements required by some global warming regulations aren’t enough. Figuring out how much methane a cow produces, then adding up the cows, may not give you ground truth when it comes to global warming. “You have to measure from the top down, and see what’s actually going into the air.”¶

#### NF3 stays in the atmosphere longer and is far more potent than C02

Scripps Institution of Oceanography 8 (Scripps Institution of Oceanography at the University of California at San Diego, The National Research Council has ranked Scripps first in faculty quality among oceanography programs nationwide, October 23, “Potent Greenhouse Gas More Prevalent in Atmosphere than Previously Assumed,” <http://scrippsnews.ucsd.edu/Releases/?releaseID=933/>, d/a 8-2-12, ads)

Compound used in manufacture of flat panel televisions, computer displays, microcircuits, solar panels is 17,000 times more potent greenhouse gas than carbon dioxide¶ Scripps Institution of Oceanography University of California, San Diego¶ A powerful greenhouse gas is at least four times more prevalent in the atmosphere than previously estimated, according to a team of researchers at Scripps Institution of Oceanography at UC San Diego. Using new analytical techniques, a team led by Scripps geochemistry professor Ray Weiss made the first atmospheric measurements of nitrogen trifluoride (NF3), which is thousands of times more effective at warming the atmosphere than an equal mass of carbon dioxide. The amount of the gas in the atmosphere, which could not be detected using previous techniques, had been estimated at less than 1,200 metric tons in 2006. The new research shows the actual amount was 4,200 metric tons. In 2008, about 5,400 metric tons of the gas was in the atmosphere, a quantity that is increasing at about 11 percent per year. "Accurately measuring small amounts of NF3 in air has proven to be a very difficult experimental problem, and we are very pleased to have succeeded in this effort," Weiss said. The research will be published Oct. 31 inGeophysical Research Letters, a journal of the American Geophysical Union (AGU). Emissions of NF3 were thought to be so low that the gas was not considered to be a significant potential contributor to global warming. It was not covered by the Kyoto Protocol, the 1997 agreement to reduce greenhouse gas emissions signed by 182 countries. The gas is 17,000 times more potent as a global warming agent than a similar mass of carbon dioxide. It survives in the atmosphere about five times longer than carbon dioxide. Current NF3 emissions, however, contribute only about 0.04 percent of the total global warming effect contributed by current human-produced carbon dioxide emissions. Nitrogen trifluoride is one of several gases used during the manufacture of liquid crystal flat-panel displays, thin-film photovoltaic cells and microcircuits. Many industries have used the gas in recent years as an alternative to perfluorocarbons, which are also potent greenhouse gases, because it was believed that no more than 2 percent of the NF3 used in these processes escaped into the atmosphere.

Prefer our studies – decades of research confirms NF3 is a significant threat

Scripps Institution of Oceanography 8 (Scripps Institution of Oceanography at the University of California at San Diego, The National Research Council has ranked Scripps first in faculty quality among oceanography programs nationwide, October 23, “Potent Greenhouse Gas More Prevalent in Atmosphere than Previously Assumed,” <http://scrippsnews.ucsd.edu/Releases/?releaseID=933/>, d/a 8-2-12, ads)

The Scripps team analyzed air samples gathered over the past 30 years, working under the auspices of the NASA-funded Advanced Global Atmospheric Gases Experiment (AGAGE) network of ground-based stations. The network was created in the 1970s in response to international concerns about chemicals depleting the ozone layer. It is supported by NASA as part of its congressional mandate to monitor ozone-depleting trace gases, many of which are also greenhouse gases. Air samples are collected at several stations around the world. The Scripps team analyzed samples from coastal clean-air stations in California and Tasmania for this research. The researchers found concentrations of the gas rose from about 0.02 parts per trillion in 1978 to 0.454 parts per trillion in 2008. The samples also showed significantly higher concentrations of NF3 in the Northern Hemisphere than in the Southern Hemisphere, which the researchers said is consistent with its use predominantly in Northern Hemisphere countries. The current observed rate of increase of NF3 in the atmosphere corresponds to emissions of about 16 percent of the amount of the gas produced globally. In response to the growing use of the gas and concerns that its emissions are not well known, scientists have recently recommended adding it to the list of greenhouse gases regulated by Kyoto. "As is often the case in studying atmospheric emissions, this study shows a significant disagreement between 'bottom-up' emissions estimates and the actual emissions as determined by measuring their accumulation in the atmosphere," Weiss said. "From a climate perspective, there is a need to add NF3 to the suite of greenhouse gases whose production is inventoried and whose emissions are regulated under the Kyoto Protocol, thus providing meaningful incentives for its wise use." "This result reinforces the critical importance of basic research in determining the overall impact of the information technology industry on global climate change, which has already been estimated to be equal to that of the aviation industry," added Larry Smarr, director of the California Institute for Telecommunications at UCSD, who was not involved in the Scripps study. Michael Prather is a UC Irvine atmospheric chemist who predicted earlier this year that based on the rapidly increasing use of NF3, larger amounts of the gas would be found in the atmosphere. Prather said the new Scripps study provides the confirmation needed to establish reporting requirements for production and use of the gas.

#### Plan net increases warming – reductions in C02 are minimal compared to external emissions

Weiss et al 8 (Ray, Scripps Institution of Oceanography Professor of Geochemistry, Jens Muhle, Peter K. Salameh, and Christina M. Harth, Scripps Institution of Oceanography, October 31, “Nitrogen trifluoride in the global atmosphere,” <http://www.agu.org/journals/gl/gl0820/2008GL035913/2008GL035913.pdf>, d/a 8-2-12, ads)

Nitrogen trifluoride (NF3) has come into increasing¶ use in the electronics industry, mainly for equipment cleaning,¶ for the etching of microcircuits, and for manufacturing¶ liquid crystal flat panel displays and thin-film photovoltaic¶ cells. As a replacement for perfluorocarbon (PFC) gases in¶ these applications, NF3 is largely destroyed during the¶ manufacturing process, resulting in reduced emissions to¶ the atmosphere [Robson et al., 2006; Lee et al., 2007]. On¶ the other hand, the global warming potential (GWP) of NF3¶ on a 100-year time horizon, about 17,000 times that of¶ carbon dioxide, is greater than the GWPs of the PFCs it¶ replaces and thus NF3 has a greater impact on Earth’s¶ climate per unit mass of emissions [Forster et al., 2007;¶ Prather and Hsu, 2008].

#### Production process causes more warming

De Decker 8(Kris, Low-tech Magazine Contributor March 03, “The ugly side of solar panels,” <http://www.energybulletin.net/authors/Kris+De+Decker>, d/a 8-2-12, ads)

Producing electricity from solar cells reduces air pollutants and greenhouse gases by about 90 percent in comparison to using conventional fossil fuel technologies, [claims](http://www.sciencedaily.com/releases/2008/02/080225090826.htm) a study called "[Emissions from Photovoltaic Life Cycles](http://pubs.acs.org/doi/full/10.1021/es071763q)", to be published this month in “Environmental Science & Technology”. Good news, it seems, until one reads the report itself. The researchers come up with a solid set of figures. However, they interpret them in a rather optimistic way. Some recalculations (skip this article if you get annoyed by numbers) produce striking conclusions.¶ Solar panels don’t come falling out of the sky – they have to be manufactured. [Similar to computer chips](http://www.lowtechmagazine.com/2009/06/embodied-energy-of-digital-technology.html), this is a dirty and energy-intensive process. First, raw materials have to be mined: quartz sand for silicon cells, metal ore for thin film cells. Next, these materials have to be treated, following different steps (in the case of silicon cells these are purification, crystallization and wafering). Finally, these upgraded materials have to be manufactured into solar cells, and assembled into modules. All these processes produce air pollution and heavy metal emissions, and they consume energy - which brings about more air pollution, heavy metal emissions and also greenhouse gases.

#### Solar doesn’t reduce emissions – empirics

Marques et al. 12 (António Cardoso Marques and José Alberto Fuinhas, University of Beira Economics Department, University of Beira Interior, Management and Economics Department and NECE, "Is renewable energy effective in promoting growth?," Energy Policy, Vol. 46, July 2012, p. 434-442, Science Direct)

With regard to the connection between reducing emissions of carbon dioxide (CO2) and economic growth, the literature also reaches unexpected results. Menyah and Wolde-Rufael (2010) found no evidence about causality running from RE to CO2, whereas the authors found unidirectional causality from CO2 to RE. Likewise, Apergis et al. (2010) conclude that the consumption of RE does not contribute to reducing CO2 emissions. Their explanation is the well-known difficulty of storing energy associated with the intermittency of renewables. Moreover, the inability to store, for example wind or solar energy, implies the simultaneous use of traditional pollutant sources of energy, such as coal and natural gas. This may be at the basis of different effects. On the one hand, it implies the maintenance of productive capacity that becomes idle in most time periods. This fact generates inefficiencies in the economy to the extent that large investments become idle over long periods. On the other hand, this intermittency may not even contribute to the reduction of countries’ energy dependence goals, as suggested by Frondel et al. (2010).

### Grid

#### Doesn’t reduce emissions – intermittency requires backup power

Livermore et al 11 (Martin, Scientific Alliance Director, Science communications consultant and commentator, Hugh Sharman, Principal of Incoteco ApS, an energy consulting and brokering company, and cofounder of DimWatt.eu, a webbased campaign for energy security, Bryan Leyland, New Zealand-based Consulting Engineer specialising inhydropower, power systems and markets, “Renewable Energy Vision or Mirage?,” <http://www.adamsmith.org/sites/default/files/research/files/ASI_renewables_report_colour_web.pdf>, d/a 8-3-12, ads)

As renewable energy sources produce power intermittently, they cannot replace gas, coal and nuclear generation, even with further development.¶ Solar and wind energy have no prospect of becoming economically competitive in an unrigged market. Government intervention will lead to higher energy costs and jeopardize energy security.¶ Increased investment in wind turbines will do little to reduce carbon emissions and fossil fuel consumption.¶ The report ‘Renewable Energy: Vision or Mirage?’, released today by the Adam Smith Institute and Scientific Alliance, reveals that the government’s focus on renewable energy sources is misguided. The UK’s plans for renewables are unrealistic, and these technologies cannot provide the secure energy supply the country needs. Present policies will lead to an energy crisis by the middle of this decade. The key points from the report are detailed below:¶ Wind and solar power do little to reduce carbon emissions, as they need large-scale back up generating capacity to compensate for their intermittency.¶ With the decommissioning of many of the UK’s coal-fired stations – and nearly all existing nuclear reactors – over the coming decade, energy security is now a priority for policymakers alongside the drive to reduce carbon dioxide emissions. However, even ignoring cost issues, problems of intermittency mean that renewable technologies are incapable of making a major contribution to energy security.¶ The Renewable Energy Roadmap for 2020 is hugely overambitious. Renewable energy generation is currently 28% below its already reduced target. Subsidising renewable energy also comes at a cost to consumers who pay for it through higher electricity prices. Nuclear and gas are the most viable energy sources to avoid a capacity crisis in the near future.¶

#### Decentralized renewable energy can’t solve blackouts

Bruch and Hunter 12 MICHAEL BRUCH Head of R&D Risk Consulting LARRY HUNTER Risk Engineer Allianz Risk Consulting Worldwide risk consulting, risk management and loss investigation services for corporate, industrial and specialty risks. Energy risks: Power trip http://www.agcs.allianz.com/assets/PDFs/GRD/GRD%20individual%20articles/Power\_blackout\_risks\_article.pdf

Many companies are unprepared for business disruptions caused by power blackouts, and are often unaware of the true costs and impact that they can have on their operations. While the majority of power failures from national grids last only a few hours, some blackouts can last days or even weeks, completely shutting down production at companies and critical infrastructures such as telecommunication networks, financial services, water supplies and hospitals. Furthermore, it is likely that power blackouts will become more frequent owing to the lack of incentives to invest in aged national grid infrastructures in Europe and the US, as well as the fact that energy from decentralized, “volatile” renewable sources is not well aligned to work on electricity grids that were designed 50 or 60 years ago. Also, as more and more grids are interconnected, a blackout in one region can trigger a domino effect that could result in supra-regional blackouts. Heightened risk from terrorism, cyber attacks and solar flares also highlights how vulnerable the world’s energy grids are to systemic failure. Research shows that the financial impacts of even a small power cut can be catastrophic. Analyses from blackout events in the US show that a 30-minute power cut results in an average loss of US$15,709 for medium and large industrial clients, and nearly US$94,000 for an eight-hour interruption. Even short blackouts – which occur several times a year in the US – add up to an annual estimated economic loss of between US$104 and US$164 billion. SOLAR STORMS AS TRIGGER A potential trigger for large-scale blackouts within the next two years may be space weather events. Geomagnetic induced solar flare storms follow an 11-year cycle and are expected to peak again in 2013. Particularly in the northern hemisphere, space weather events could severely damage high-voltage transformers whose repair can take weeks.

#### No risk of sabotage - their internal link is based on flawed topological models.

Page, ‘10

[Lewis Page, “Power grid scare stories a 'bunch of hooey',” The Register, 13th October 2010, http://www.theregister.co.uk/2010/10/13/leccy\_grid\_strike\_hooey/]

There have been a lot of scare stories in the media about electrical power grids in recent times, suggesting that it would be a simple matter to bring down a national transmission system by way of a minor cyber attack or physical sabotage—thereby bringing that nation's infrastructure to a grinding halt. There's just one problem with that idea: it's "a bunch of hooey," according to power-engineering boffin Seth Blumsack. Blumsack and his colleagues were moved to look into the matter of deliberate power-grid crashing after recent papers and studies in hefty journals—including some briefed to US politicians—painted a grim picture earlier this year. The perception was that making a targeted strike on a relatively minor electrical installation such as a neighbourhood substation (by bomb, arson or electronic/network sabotage) could easily bring down the whole grid to which it was attached. According to Blumsack and his fellow 'leccy boffins Eduardo Cotilla-Sanchez and Ed Hines, the alarmist analyses are based on a particular type of mathematical modelling of power grids—so-called "topological" models. "Some modellers have gotten so fascinated with these abstract networks that they've ignored the physics of how things actually work," Hines says. "This can lead you grossly astray." Blumsack, Hines and Cotilla-Sanchez decided to contrast the performance of a topological model with one based on actual physics—specifically on Ohm's and Kirchoff's Laws governing the flow of electricity in the real world. They tried out both kinds of model on an accurate representation of the North American Eastern Interconnect, the largest and one of the most trouble-prone portions of the US grid, using real-world data from a test case generated in 2005. The three engineers say that the physics-driven model was much closer to reality, and that this verifies what physics models show. The results showed that in fact it is major grid components through which a lot of power flows—big generating stations and massive transformers—which are the main points of vulnerability, not the minor installations scattered across the country. It isn't so much that a minor event on a minor line or installation can't crash the network: such things do happen. But in general there have to be huge numbers of such minor events before one of them happens to hit the miracle weak point and bring everything down. It would be an impossible task for terrorists or other malefactors to know in advance just where and when a minor pinprick could cause massive effects. "Our system is quite robust to small things failing," says Hines. Hitting a bigger installation or link, which would generally be better secured and more resilient, would be much more likely to work. Even then a well-resourced terror or sabotage unit with the ability to knock out bigger grid components would struggle to take down the whole thing as it is still very difficult to know exactly where and when to strike. "It takes an incredible amount of information," says Hines, "to really figure out how to make the grid fail."

### Water

#### Agriculture outweighs energy production, and market forces make depletion inevitable

The Telegraph 3/7/13 [Charles Laurence, “US farmers fear the return of the Dust Bowl,” http://www.telegraph.co.uk/earth/8359076/US-farmers-fear-the-return-of-the-Dust-Bowl.html]

All may come to naught in the face of a threat that has nothing to do with corn or beef, but everything to do with the American devotion to making money at any cost. The Texas oil billionaire and corporate raider T Boone Pickens is after their water. He is proving to be the ultimate test of their free market gospel of the 'right to capture'. Ten years ago Pickens concluded that the prophets of climate-change may well be right, and if they were, that water would become more valuable than the oil that had made his fortune. He formed a company called Mesa Water, and began buying up Panhandle land with water rights over the Ogallala. He is now the largest individual water owner in America, with rights over enough of the aquifer to drain an estimated 200,000 acre-feet a year, at least until the land goes dry. That is 65 billion gallons a year, or, to put it another way, 124,000 gallons a minute. The plan? Ninety-five per cent of Ogallala water is now used for agriculture, but Pickens plans to pipe it 250 miles to Dallas, expected to triple in size in 30 years, with a demand for water far exceeding supply. Pickens is making the hottest of climate-change bets: that water's value will rocket as it runs dry. One man's thirst is another man's fortune. Irrigation farming would simply follow gold mining, open-range ranching and oil drilling in the traditional cycle of boom and bust. 'There are people who will buy the water when they need it. And the people who have the water want to sell it,' Pickens has said. 'That's the blood, guts, and feathers of the thing.' 'Obviously it would be a disaster for the Panhandle,' Steve Walthour, manager of the North Plains Groundwater Conservation District, says. 'But if there are no limits, he can take all he wants. That's the law of capture.'

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#### 2. The American Bar Association proves our interp is an intent to define:

Columbia Law School, 2012, Center for Climate Change Law, “State Actions on Clean Energy: A Fifty-State Survey,” <http://web.law.columbia.edu/climate-change/resources/energy-law>

The book, The Law of Clean Energy: Efficiency and Renewables (Michael B. Gerrard, ed.), to be published by the American Bar Association (published by the American Bar Association in May 2011), includes as its appendix a fifty-state survey of state actions on clean energy. Specifically, the fifty-state survey provides a brief overview of the laws and policies adopted by each state to promote energy efficiency and renewable energy. The fifty-state survey is organized into three general categories: (1) financial incentives; (2) rules and regulations; and (3) policies, plans and governmental affiliations. Financial incentives include tax benefits, loan programs, grants, and rebates. Rules and regulations include renewable portfolio standards, facility siting and permitting considerations, building codes, appliance and equipment standards, regulations regarding electricity transmission and storage, fuel standards, and government procurement requirements. Policies, plans and governmental affiliations include plans for reducing statewide greenhouse gas emissions and energy consumption, the government entities tasked with the development and administration of these clean energy initiatives, and regional memberships.

#### 4. Opening the door to increased regulations massively explodes aff ground:

Database of State Incentives for Renewables and Efficiency 12

<http://www.dsireusa.org/glossary/>

¶ DSIRE organizes incentives and policies that promote renewable energy and energy efficiency into two general categories -- (1) Financial Incentives and (2) Rules, Regulations & Policies -- and roughly 30 specific types of incentives and policies. This glossary provides a description of each specific incentive and policy type.¶ ¶ FINANCIAL INCENTIVES (click to collapse section)¶ ¶ Corporate Tax Incentives¶ Corporate tax incentives include tax credits, deductions and exemptions. These incentives are available in some states to corporations that purchase and install eligible renewable energy or energy efficiency equipment, or to construct green buildings. In a few cases, the incentive is based on the amount of energy produced by an eligible facility. Some states allow the tax credit only if a corporation has invested a minimum amount in an eligible project. Typically, there is a maximum limit on the dollar amount of the credit or deduction. In recent years, the federal government has offered corporate tax incentives for renewables and energy efficiency. (Note that corporate tax incentives designed to support manufacturing and the development of renewable energy systems or equipment, or energy efficiency equipment, are categorized as “Industry Recruitment/Support” in DSIRE.)¶ Grant Programs¶ States offer a variety of grant programs to encourage the use and development of renewables and energy efficiency. Most programs offer support for a broad range of technologies, while a few programs focus on promoting a single technology, such as photovoltaic (PV) systems. Grants are available primarily to the commercial, industrial, utility, education and/or government sectors. Most grant programs are designed to pay down the cost of eligible systems or equipment. Others focus on research and development, or support project commercialization. In recent years, the federal government has offered grants for renewables and energy efficiency projects for end-users. Grants are usually competitive.¶ Green Building Incentives¶ Green buildings are designed and constructed using practices and materials that minimize the impacts of the building on the environment and human health. Many cities and counties offer financial incentives to promote green building. The most common form of incentive is a reduction or waiver of a building permit fee. Several organizations issue certification for green buildings, including the U.S. Green Building Council (LEED certification), the Green Building Initiative (Green Globes certification), and the NAHB Research Center (National Green Building Certification). (Note that this category includes green building incentives that do not fall under other DSIRE incentive categories, such as tax incentives and grant programs.)¶ Industry Recruitment/Support¶ To promote economic development and the creation of jobs, some states offer financial incentives to recruit or cultivate the manufacturing and development of renewable energy systems and equipment. These incentives commonly take the form of tax credits, tax exemptions and grants. In some cases, the amount of the incentive depends on the quantity of eligible equipment that a company manufactures. Most of these incentives apply to several renewable energy technologies, but a few states target specific technologies, such as wind or solar. These incentives are usually designed as temporary measures to support industries in their early years. They commonly include a sunset provision to encourage the industries to become self-sufficient.¶ Loan Programs¶ Loan programs provide financing for the purchase of renewable energy or energy efficiency systems or equipment. Low-interest or zero-interest loans for energy efficiency projects are a common demand-side management (DSM) practice for electric utilities. State governments also offer low-interest loans for a broad range of renewable energy and energy efficiency measures. These programs are commonly available to the residential, commercial, industrial, transportation, public and/or non-profit sectors. Loan rates and terms vary by program; in some cases, they are determined on an individual project basis. Loan terms are generally 10 years or less. In recent years, the federal government has offered loans and/or loan guarantees for renewables and energy efficiency projects.¶ PACE Financing¶ Property-Assessed Clean Energy (PACE) financing effectively allows property owners to borrow money to pay for renewable energy and/or energy-efficiency improvements. The amount borrowed is typically repaid over a period of years via a special assessment on the owner's property. In general, local governments (such as cities and counties) that choose to offer PACE financing must be authorized to do so by state law.¶ Performance-Based Incentives¶ Performance-based incentives (PBIs), also known as production incentives, provide cash payments based on the number of kilowatt-hours (kWh) or BTUs generated by a renewable energy system. A "feed-in tariff" is an example of a PBI. To ensure project quality, payments based on a system’s actual performance are generally more effective than payments based on a system’s rated capacity. (Note that tax incentives based on the amount of energy produced by an eligible commercial facility are categorized as “Corporate Tax Incentives” in DSIRE.)¶ Personal Tax Incentives¶ Personal tax incentives include income tax credits and deductions. Many states offer these incentives to reduce the expense of purchasing and installing renewable energy or energy efficiency systems and equipment. The percentage of the credit or deduction varies by state, and in most cases, there is a maximum limit on the dollar amount of the credit or deduction. An allowable credit may include carryover provisions, or it may be structured so that the credit is spread out over a certain number of years. Eligible technologies vary widely by state. In recent years, the federal government has offered personal tax credits for renewables and energy efficiency.¶ Property Tax Incentives¶ Property tax incentives include exemptions, exclusions, abatements and credits. Most property tax incentives provide that the added value of a renewable energy system is excluded from the valuation of the property for taxation purposes. For example, if a new heating system that uses renewable energy costs more than a conventional heating system, the additional cost of the renewable energy system is not included in the property assessment. In a few cases, property tax incentives apply to the additional cost of a green building. Because property taxes are collected locally, some states have granted local taxing authorities the option of allowing a property tax incentive for renewables.¶ Rebate Programs¶ States, utilities and a few local governments offer rebates to promote the installation of renewables and energy efficiency projects. The majority of rebate programs that support renewables are administered by states, municipal utilities and electric cooperatives; these programs commonly provide funding for solar water heating and/or photovoltaic (PV) systems. Most rebate programs that support energy efficiency are administered by utilities. Rebate amounts vary widely by technology and program administrator.¶ Sales Tax Incentives¶ Sales tax incentives typically provide an exemption from, or refund of, the state sales tax (or sales and use tax) for the purchase of a renewable energy system, an energy-efficient appliance, or other energy efficiency measures. Several states have established an annual “sales tax holiday” for energy efficiency measures by annually allowing a temporary exemption – usually for one or two days – from the state sales tax.¶ ¶ RULES, REGULATIONS & POLICIES (click to collapse section)¶ ¶ Appliance/Equipment Efficiency Standards¶ Many states have established minimum efficiency standards for certain appliances and equipment. In these states, the retail sale of appliances and equipment that do not meet the established standards is prohibited. The federal government has also established efficiency standards for certain appliances and equipment. When both the federal government and a state have adopted efficiency standards for the same type of appliance or equipment, the federal standard overrides the state standard (even if the state standard is stricter).¶ Building Energy Codes¶ Building energy codes adopted by states (and some local governments) require commercial and/or residential construction to adhere to certain energy standards. While some government entities have developed their own building energy codes, many use existing codes (sometimes with state-specific amendments), such as the International Energy Conservation Code (IECC), developed and published by the International Code Council (ICC); or ASHRAE 90.1, developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). A few local building energy codes require certain commercial facilities to meet green building standards.¶ Energy Efficiency Resource Standards (EERS)¶ Energy efficiency resource standards (EERS) are state policies that require utilities to meet specific targets for energy savings according to a set schedule. EERS policies establish separate reduction targets for electricity sales, peak electric demand and/or natural gas consumption. In most cases, utilities must achieve energy savings by developing demand-side management (DSM) programs, which typically provide financial incentives to customers to install energy-efficient equipment. An EERS policy is sometimes coupled with a state’s renewables portfolio standard (RPS). In these cases, energy efficiency is typically included as a lower-tier resource.¶ Energy Standards for Public Buildings¶ Many states and local governments, as well as the federal government, have chosen to lead by example by requiring new government buildings to meet strict energy standards. DSIRE includes policies that have established green building standards, energy-reduction goals, equipment-procurement requirements, and/or the use of on-site renewable energy. Many of these policies require that new government buildings (and renovated buildings, in some cases) attain a certain level of certification under the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) program. Equipment-procurement policies often mandate the use of the most efficient equipment, including equipment that meets federal Energy Star criteria. Policies designed to encourage the use of on-site renewables generally establish conditional requirements tied to life-cycle cost analysis.¶ Equipment Certification Requirements¶ Policies requiring renewable energy equipment to meet certain standards serve to protect consumers from buying inferior equipment. These requirements not only benefit consumers; they also protect the renewable energy industry by keeping substandard systems out of the market.¶ Generation Disclosure¶ Some states require electric utilities to provide their customers with specific information about the electricity that the utility supplies. This information, which generally must be shared with customers periodically, usually includes the utility's fuel mix percentages and emissions statistics. In states with restructured electricity markets, generation disclosure policies are designed to help consumers make informed decisions about the electricity and suppliers they choose. A few states that have not fully restructured their electricity markets require generation disclosure by utilities.¶ Green Power Purchasing Policies¶ Government entities, businesses, residents, schools, non-profits and others can play a significant role in supporting renewable energy by buying electricity from renewable resources, or by buying renewable energy credits (RECs). Many state and local governments, as well as the federal government, have committed to buying green power to account for a certain percentage of their electricity consumption. Green power purchases are typically executed through contracts with green power marketers or project developers, through utility green power programs, or through community aggregation.¶ Interconnection Standards¶ Interconnection standards specify the technical and procedural process by which a customer connects an electricity-generating to the grid. Such standards include the technical and contractual terms that system owners and utilities must abide by. State public utilities commissions typically establish standards for interconnection to the distribution grid, while the Federal Energy Regulatory Commission (FERC) has adopted standards for interconnection to the transmission level. Many states have adopted interconnection standards, but some states’ standards apply only to investor-owned utilities -- not to municipal utilities or electric cooperatives. (Several states have adopted interconnection guidelines, which are weaker than standards and generally apply only to net-metered systems.)¶ Line Extension Analysis¶ When a prospective customer requests electric service for a home or facility that is not currently served by the electric grid, the customer usually must pay a distance-based fee for the cost of extending power lines to the home or facility. In some cases, it is cheaper to use an on-site renewable energy system to meet a prospective customer’s electricity needs. A few states require utilities to provide information regarding renewable energy options when a line extension is requested.¶ Mandatory Utility Green Power Option¶ Several states require electric utilities to offer customers the option to buy electricity generated from renewable resources, commonly known as “green power.” Typically, utilities offer green power generated using renewable resources that the utilities own (or for which they contract), or they buy renewable energy credits (RECs) from a provider certified by a state public utilities commission.¶ Net Metering¶ For electric customers who generate their own electricity, net metering allows for the flow of electricity both to and from the customer – typically through a single, bi-directional meter. When a customer’s generation exceeds the customer’s use, electricity from the customer flows back to the grid, offsetting electricity consumed by the customer at a different time during the same billing cycle. In effect, the customer uses excess generation to offset electricity that the customer otherwise would have to purchase at the utility’s full retail rate. Net metering is required by law in most U.S. states, but these policies vary widely.¶ Public Benefit Funds¶ Most public benefit funds (PBFs) were developed by states during the electric utility restructuring era, in the late 1990s, to ensure continued support for renewable energy, energy efficiency and low-income energy programs. These funds are commonly supported through a very small surcharge on electricity consumption (e.g., $0.002/kWh). This charge is sometimes referred to as a "system benefits charge" (SBC). PBFs commonly support rebate programs, loan programs, research and development, and energy education programs.¶ Renewables Portfolio Standards (RPS)¶ Renewable portfolio standards (RPSs) require utilities to use renewable energy or renewable energy credits (RECs) to account for a certain percentage of their retail electricity sales -- or a certain amount of generating capacity -- according to a specified schedule. (Renewable portfolio goals are similar to RPS policies, but renewable portfolio goals are not legally binding.) Most U.S. states have established an RPS. The term “set-aside” or “carve-out” refers to a provision within an RPS that requires utilities to use a specific renewable resource (usually solar energy) to account for a certain percentage of their retail electricity sales (or a certain amount of generating capacity) according to a set schedule.¶ Solar & Wind Access Policies¶ Solar and wind access policies are designed to establish a right to install and operate a solar or wind energy system at a home or other facility. Some solar access laws also ensure a system owner’s access to sunlight. These laws may be implemented at both the state and local levels. In some states, access rights prohibit homeowners associations, neighborhood covenants and local ordinances from restricting a homeowner’s right to use solar energy. Easements, the most common form of solar access policy, allow for the rights to existing access to a renewable resource on the part of one property owner to be secured from an owner whose property could be developed in such a way as to restrict that resource. An easement is usually transferred with the property title. At the local level, communities use several policies to protect solar access, including solar access ordinances, development guidelines requiring proper street orientation, zoning ordinances that contain building height restrictions, and solar permits.¶ Solar & Wind Contractor Licensing¶ Some states have established a licensing process for solar-energy contractors and/or wind-energy contractors. These requirements are designed to ensure that contractors have the necessary knowledge and experience to install systems properly. Solar licenses typically take the form of either a separate, specialized solar contractor’s license, or a specialty classification under a general electrical or plumbing license.¶ Solar & Wind Permitting Standards¶ Permitting standards can facilitate the installation of wind and solar energy systems by specifying the conditions and fees involved in project development. Some local governments have adopted simplified or expedited permitting standards for wind and/or solar. “Top-of-the-stack” permitting (or fast-track permitting) saves system owners and project developers time and money. Some states have capped fees that local governments may charge for a permit for a solar or wind energy system. In addition, some states have developed (or have supported the development of) model wind ordinances for use by local governments.

#### Precision-Prefer our evidence---DSIRE is the best source for incentive definitions

Gouchoe, 2k -North Carolina Solar Center Industrial Extension Service North Carolina State University (Susan, “Local Government and Community Programs and Incentives for Renewable Energy— National Report,” <http://seg.fsu.edu/Library/casestudy%20of%20incentives.pdf>

The Database of State Incentives for Renewable Energy (DSIRE) serves as the nation’s most comprehensive source of information on the status of programs and incentives for renewable energy. The database tracks these programs at the state, utility, local, and community level. Established in 1995, DSIRE is an ongoing project of the Interstate Renewable Energy Council (IREC) and is managed by the North Carolina Solar Center with funding from the U.S. Department of Energy’s Office of Power Technologies.¶ The first three phases of the DSIRE project—surveys of state financial incentives, state regulatory policies, and utility programs and incentives—have been completed. Information from these databases has been published in three previous reports: National Summary Report on State Financial Incentives for Renewable Energy (1997); National Summary Report on State Programs and Regulatory Policies for Renewable Energy (1998); and National Summary Report on Utility Programs and Incentives for Renewable Energy (1999). These reports summarize incentives, programs, and policies that promote active and passive solar, photovoltaics, wind, biomass, alternative fuels, geothermal, hydropower, and waste energy sources. Given the rapidly changing status of state activities, an updated report— National Summary Report on State Financial and Regulatory Incentives for Renewable Energy—has been produced concurrently with this report on local initiatives.¶ While reports serve as a snapshot of the status of incentives and programs, constant revisions and additions to the database maintain DSIRE’s role as the most up-to-date, national clearinghouse of information on incentives and programs for renewable energy. Through DSIRE on Line, the DSIRE database is accessible via the web at: http://www.ncsc.ncsu.edu/dsire.htm. In 2001, federal incentives will be added to the database, thereby providing a complete and comprehensive database of renewable energy incentives at all levels—national, state, and local.

#### Err negative on questions of limits – it’s always better to overlimit rather than underlimit because depth trumps breadth.

TPC, ‘10

[Texas Panhandle P-16 Council, Texas based group of teachers and educators from across the state, 2010, “Breadth vs. Depth of High School Curriculum Content”,

<http://www.panhandlep-16.net/users/0001/docs/Position%20Paper2.pdf>, RSR]

Less breadth and more depth in curriculum better prepares students for future careers and education. This is the position of over one hundred faculty assembled in the Texas Panhandle, and it is also the conclusion of many scholarly studies reviewed for this paper. In fact, there are far too many studies to cite in this paper, so only a few representative studies are used. In a 2008 study entitled “Depth Versus Breadth: How Content Coverage in High School Science Courses Relates to Later Success in College Science Coursework” 1 the researchers noted: “In a comparison of 46 countries, Schmidt et al. (2005) noted that in top-achieving countries, the science frameworks cover far fewer topics than in the United States, and that students from these countries perform significantly better than students in the United States. They conclude that U.S. standards are not likely to create a framework that develops a deeper understanding of the structure of the discipline. By international standards, the U.S. science framework is „unfocused, repetitive, and undemanding‟”. The study went on to say that “the baseline model reveals a direct and compelling outcome: teaching for depth is associated with improvements in later performance”

#### 6. Specifically, this interp lets in affs that completely dodge links to government alteration of energy markets, destroys core negative ground

Singh-Renewable Energy Policy Project-98 [Government Procurement to Expand PV Markets](http://www.repp.org/repp_pubs/pdf/pv4.pdf)

<http://www.repp.org/repp_pubs/articles/pv/pvs.html#4>

A good government procurement program for renewables should take into account the needs of the private market. The creation of a government market for renewables that bears no relationship to the private market eliminates the indirect, but potentially enormous economic development and environmental benefits of commercializing renewables in the private market. Too often policy efforts to create a government market have resulted in submarkets reflective of governments’ unique needs and procedures. For many PV firms, devoting substantial staff time to government contracts may detract significantly from efforts oriented to the larger private market.