# Round 5 – ASU RV vs. UNT MQ (Neg)

## 1NC

### 1

#### A. Interpretation – power purchase requirements 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.

#### 3. Effects topicality – obtaining electricity does not increase the production of energy – even if they win that they increase demand, this just makes them effects T at best

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

### 2

#### Text: The Nuclear Regulatory Commission should remove current licensing regulations for small modular nuclear reactors and establish an alternative licensing pathway that accounts for the unique attributes of small modular reactors and the United States

#### Reform of NRC regulations for Small Modular Reactors key to spur the industry – must reject subsidies because they cause market instability that turns case.

Spencer & Loris, Nuclear Research Fellow @ Thomas Roe Institute, ’11

[Jack Spencer, Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies, Nicolas D. Loris is a Research Associate in the Roe Institute at The Heritage Foundation, “A Big Future for Small Nuclear Reactors?,” February 2nd 2011, http://www.heritage.org/research/reports/2011/02/a-big-future-for-small-nuclear-reactors]

If SMRs Are So Great, Where Is the Construction? While some designs are closer to market introduction than others, the fact is that America’s regulatory and policy environment is not sufficient to support a robust expansion of existing nuclear technologies, much less new ones. New reactor designs are difficult to license efficiently, and the lack of a sustainable nuclear waste management policy causes significant risk to private investment. Many politicians are attempting to mitigate these market challenges by offering subsidies, such as loan guarantees. While this approach still enjoys broad support in Congress and industry, the reality is that it has not worked. Despite a lavish suite of subsidies offered in the Energy Policy Act of 2005, including loan guarantees, insurance against government delays, and production tax credits, no new reactors have been permitted, much less constructed. These subsidies are in addition to existing technology development cost-sharing programs that have been in place for years and defer significant research and development costs from industry to the taxpayer. The problem with this approach is that it ignores the larger systemic problems that create the unstable marketplace to begin with. These systemic problems generally fall into three categories: Licensing. The Nuclear Regulatory Commission (NRC) is ill prepared to build the regulatory framework for new reactor technologies, and no reactor can be offered commercially without an NRC license. In a September 2009 interview, former NRC chairman Dale E. Klein said that small nuclear reactors pose a dilemma for the NRC because the commission is uneasy with new and unproven technologies and feels more comfortable with large light water reactors, which have been in operation for years and has a long safety record.[11] The result is that enthusiasm for building non-light-water SMRs is generally squashed at the NRC as potential customers realize that there is little chance that the NRC will permit the project within a timeframe that would promote near-term investment. So, regardless of which attributes an SMR might bring to the market, the regulatory risk is such that real progress on commercialization is difficult to attain. This then leaves large light water reactors, and to a lesser extent, small ones, as the least risky option, which pushes potential customers toward that technology, which then undermines long-term progress, competition, and innovation. Nuclear Waste Management. The lack of a sustainable nuclear waste management solution is perhaps the greatest obstacle to a broad expansion of U.S. nuclear power. The federal government has failed to meet its obligations under the 1982 Nuclear Waste Policy Act, as amended, to begin collecting nuclear waste for disposal in Yucca Mountain. The Obama Administration’s attempts to shutter the existing program to put waste in Yucca Mountain without having a backup plan has worsened the situation. This outcome was predictable because the current program is based on the flawed premise that the federal government is the appropriate entity to manage nuclear waste. Under the current system, waste producers are able to largely ignore waste management because the federal government is responsible. The key to a sustainable waste management policy is to directly connect financial responsibility for waste management to waste production. This will increase demand for more waste-efficient reactor technologies and drive innovation on waste-management technologies, such as reprocessing. Because SMRs consume fuel and produce waste differently than LWRs, they could contribute greatly to an economically efficient and sustainable nuclear waste management strategy. Government Intervention. Too many policymakers believe that Washington is equipped to guide the nuclear industry to success. So, instead of creating a stable regulatory environment where the market value of different nuclear technologies can determine their success and evolution, they choose to create programs to help industry succeed. Two recent Senate bills from the 111th Congress, the Nuclear Energy Research Initiative Improvement Act (S. 2052) and the Nuclear Power 2021 Act (S. 2812), are cases in point. Government intervention distorts the normal market processes that, if allowed to work, would yield the most efficient, cost-effective, and appropriate nuclear technologies. Instead, the federal government picks winners and losers through programs where bureaucrats and well-connected lobbyists decide which technologies are permitted, and provides capital subsidies that allow investors to ignore the systemic problems that drive risk and costs artificially high. This approach is especially detrimental to SMRs because subsidies to LWRs distort the relative benefit of other reactor designs by artificially lowering the cost and risk of a more mature technology that already dominates the marketplace. How to Fix a Broken System At the Global Nuclear Renaissance Summit on July 24, 2008, then-NRC chairman Dale Klein said that a nuclear renaissance with regard to small reactors will take “decades to unfold.”[12] If Members of Congress and government agencies do not reform their current approach to nuclear energy, this will most certainly be the case. However, a new, market-based approach could lead to a different outcome. Instead of relying on the policies of the past, Congress, the Department of Energy, and the NRC should pursue a new, 21st-century model for small and alternative reactor technologies by doing the following: Reject additional loan guarantees. Loan guarantee proponents argue that high up-front costs of new large reactors make them unaffordable without loan guarantees. Presumably, then, a smaller, less expensive modular option would be very attractive to private investors even without government intervention. But loan guarantees undermine this advantage by subsidizing the capital costs and risk associated with large reactors. A small reactor industry without loan guarantees would also provide competition and downward price pressure on large light water reactors. At a minimum, Congress should limit guarantees to no more than two plants of any reactor design and limit to two-thirds the amount of any expanded loan guarantee program that can support a single technology. Such eligibility limits will prevent support from going only to a single basic technology, such as large light water reactors.[13] Avoid subsidies. Subsidies do not work if the objective is a diverse and economically sustainable nuclear industry. Despite continued attempts to subsidize the nuclear industry into success, the evidence demonstrates that such efforts invariably fail. The nuclear industry’s success stories are rooted in the free market. Two examples include the efficiency and low costs of today’s existing plants, and the emergence of a private uranium enrichment industry. Government intervention is the problem, as illustrated by the government’s inability to meet its nuclear waste disposal obligations. Build expertise at the Nuclear Regulatory Commission. The NRC is built to regulate large light water reactors. It simply does not have the regulatory capability and resources to efficiently regulate other technologies, and building that expertise takes time. Helping the NRC to develop that expertise now would help bring new technologies into the marketplace more smoothly. Congress should direct and resource the NRC to develop additional broad expertise for liquid metal-cooled, fast reactors and high-temperature, gas-cooled reactors. With its existing expertise in light water technology, this additional expertise would position the NRC to effectively regulate an emerging SMR industry. Establish a new licensing pathway. The current licensing pathway relies on reactor customers to drive the regulatory process. But absent an efficient and predictable regulatory pathway, few customers will pursue these reactor technologies. The problem is that the legal, regulatory, and policy apparatus is built to support large light water reactors, effectively discriminating against other technologies. Establishing an alternative licensing pathway that takes the unique attributes of small reactors into consideration could help build the necessary regulatory support on which commercialization ultimately depends.[14] Resolve staffing, security, construction criteria, and fee-structure issues by December 31, 2011. The similarity of U.S. reactors has meant that the NRC could establish a common fee structure and many general regulatory guidelines for areas, such as staffing levels, security requirements, and construction criteria. But these regulations are inappropriate for many SMR designs that often have smaller staff requirements, unique control room specifications, diverse security requirements, and that employ off-site construction techniques. Subjecting SMRs to regulations built for large light water reactors would add cost and result in less effective regulation. The NRC has acknowledged the need for this to be resolved and has committed to doing so, including developing the budget requirements to achieve it. It has not committed to a specific timeline.[15] Congress should demand that these issues be resolved by the end of 2011. Reform waste management. The federal government’s inability to fulfill its legal obligations under the 1982 Nuclear Waste Policy Act has often been cited as a significant obstacle to building additional nuclear power plants. Given nuclear power’s potential to help solve many of the nation’s energy problems, now is the time to break the impasse over managing the nation’s used nuclear fuel. The current system is driven by government programs and politics. There is little connection between used-fuel management programs, economics, and the needs of the nuclear industry. Any successful plan must grow out of the private sector, be driven by sound economics, and provide access to the funds that have been set aside for nuclear waste management.[16] Such an approach would propel the development of SMRs by placing market value on their potential waste management attributes. Transitioning to a New Era of Nuclear Power It is an exciting time for the nuclear industry in the United States and around the world, but that excitement could quickly dwindle if Congress and the White House do not usher in a new path forward for nuclear energy. New technologies have the potential to revolutionize how people produce and consume energy, but if the same bureaucratic approach is taken, it will create the same problems of dependency and stagnation that led to the demise of the commercial nuclear industry decades ago. Congress and the Administration have the opportunity to create a robust, competitive market for nuclear power and should implement the necessary reforms to make this happen.

### 3

#### 1. CIR will pass now

Martin 3/22 (Gary, San Antonio Express News columnist, GOP developments on immigration reform give hope of eventual legislative action, http://www.mysanantonio.com/opinion/columnists/gary\_martin/article/GOP-developments-on-immigration-reform-give-hope-4377241.php#ixzz2OJ9VowEV)

Several developments on Capitol Hill this week led many to believe Congress will pass a comprehensive immigration reform bill this year.¶ Those developments involved traditional Republican opposition to citizenship for undocumented immigrants.¶ First, the Republican National Committee issued a report that recommended the GOP embrace comprehensive reform — which commonly denotes citizenship.¶ Second was the support for eventual citizenship by GOP presidential hopeful Rand Paul, although tortured in his explanation. Paul's nuanced speech to the U.S. Hispanic Chamber of Commerce was careful to avoid the actual word “citizenship,” which conservatives often claim to be “amnesty.”¶ All this was watched intently by Democrats, who voiced disbelief at how fast the GOP position on immigration reform has shifted since the November election.

#### 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. Spending on SMRs is unpopular.

Nelson and Northey, ‘12

[Gabriel and Hannah, Reporters at E&E, “DOE funding for small reactors languishes as parties clash on debt,” http://www.eenews.net/public/Greenwire/2012/09/24/3]

It's not just wind and solar projects that are waiting for federal help as Congress duels over the importance of putting taxpayer dollars on the line for cutting-edge energy projects. Some of the nation's largest nuclear power companies are anxious to hear whether they will get a share of a $452 million pot from the Department of Energy for a new breed of reactors that the industry has labeled as a way to lessen the safety risks and construction costs of new nuclear power plants. The grant program for these "small modular reactors," which was announced in January, would mark the official start of a major U.S. foray into the technology even as rising construction costs -- especially when compared to natural-gas-burning plants -- cause many power companies to shy away from nuclear plants. DOE received four bids before the May 21 deadline from veteran reactor designers Westinghouse Electric Co. and Babcock & Wilcox Co., as well as relative newcomers Holtec International Inc. and NuScale Power LLC. Now the summer has ended with no announcement from DOE, even though the agency said it would name the winners two months ago. As the self-imposed deadline passed, companies started hearing murmurs that a decision could come in September, or perhaps at the end of the year. To observers within the industry, it seems that election-year calculations may have sidelined the contest. "The rumors are a'flying," said Paul Genoa, director of policy development at the Nuclear Energy Institute, in an interview last week. "All we can imagine is that this is now caught up in politics, and the campaign has to decide whether these things are good for them to announce, and how." Small modular reactors do not seem to be lacking in political support. The nuclear lobby has historically courted both Democrats and Republicans and still sees itself as being in a strong position with key appropriators on both sides of the aisle. Likewise, top energy officials in the Obama administration have hailed the promise of the new reactors, and they haven't shown any signs of a change of heart. DOE spokeswoman Jen Stutsman said last week that the department is still reviewing applications, but she did not say when a decision will be made. "This is an important multiyear research and development effort, and we want to make sure we take the time during the review process to get the decision right," she wrote in an email. That the grants haven't been given out during a taut campaign season, even as President Obama announces agency actions ranging from trade cases to creating new national monuments to make the case for his re-election, may be a sign that the reactors are ensnared in a broader feud over energy spending. Grant recipients would develop reactor designs with an eye toward eventually turning those into pilot projects -- and the loan guarantees that these first-of-a-kind nuclear plants are using today to get financing would be blocked under the "No More Solyndras" bill that passed the House last week (Greenwire, Sept. 14). Congress has given the grant program $67 million for fiscal 2012, shy of the amount that would be needed annually to reach full funding. If the "sequester" kicks in at year's end and slashes DOE funding or the balance of power changes in Washington, the amount of money available could dwindle yet again. Even the staunchest supporters of the federal nuclear program are acknowledging it is a tough time to promise a $452 million check. Former Sen. Pete Domenici, a New Mexico Republican who pushed for new reactors as chairman of both the Senate Energy and Natural Resources Committee and the Energy and Water Appropriations Subcommittee, said during a brief interview Tuesday that well-designed loan guarantees won't cost too much because they get repaid over time. The cost could be borne by a "tiny little tax" on the nuclear industry, he said. But when it comes to straight-up spending, like the grants that would support getting these cutting-edge reactors ready for their first demonstrations, the solution may not be so clear. While some Republicans remain staunch supporters of funding for the nuclear power industry, there are others who label the government subsidies as a waste of taxpayer dollars. "It's awful hard, with the needs that are out there and the debt that haunts us, to figure out how you're going to establish priorities," said Domenici, who has advocated for the deployment of new nuclear reactors as a fellow at the Bipartisan Policy Center. "I can't stand here and tell you that I know how to do that."

#### 4. Immigration reform expands skilled labor --- spurs relations and economic growth in China and India.

Los Angeles **Times**, 11/9/**2012** (Other countries eagerly await U.S. immigration reform, p. http://latimesblogs.latimes.com/world\_now/2012/11/us-immigration-reform-eagerly-awaited-by-source-countries.html)

"Comprehensive immigration reform will see expansion of skilled labor visas," predicted B. Lindsay Lowell, director of policy studies for the Institute for the Study of International Migration at Georgetown University. A former research chief for the congressionally appointed Commission on Immigration Reform, Lowell said he expects to see at least a fivefold increase in the number of highly skilled labor visas that would provide "a significant shot in the arm for India and China." There is widespread consensus among economists and academics that skilled migration fosters new trade and business relationships between countries and enhances links to the global economy, Lowell said. "Countries like India and China weigh the opportunities of business abroad from their expats with the possibility of brain drain, and I think they still see the immigration opportunity as a bigger plus than not," he said.

#### 5. US/India relations averts South Asian nuclear war.

**Schaffer**, Spring **2002** (Teresita – Director of the South Asia Program at the Center for Strategic and International Security, Washington Quarterly, p. Lexis)

Washington's increased interest in India since the late 1990s reflects India's economic expansion and position as Asia's newest rising power. New Delhi, for its part, is adjusting to the end of the Cold War. As a result, both giant democracies see that they can benefit by closer cooperation. For Washington, the advantages include a wider network of friends in Asia at a time when the region is changing rapidly, as well as a stronger position from which to help calm possible future nuclear tensions in the region. Enhanced trade and investment benefit both countries and are a prerequisite for improved U.S. relations with India. For India, the country's ambition to assume a stronger leadership role in the world and to maintain an economy that lifts its people out of poverty depends critically on good relations with the United States.

### No War

#### Most recent global problems increase the likelihood of nuclear war – empirics prove.

Bay, Author and Syndicated columnist, professor, developmental aid advocate, radio commentator, retired reserve soldier, war game designer, principal in a training simulations and technology consulting company, ‘12

[Austin, “Greek Tragedy: Political Effects of a Deep Global Depression,” <http://www.strategypage.com/on_point/2012010319150.aspx>, Nisarg]

Colossal sovereign debts owed by member nations may yet shatter the eurozone. The political effects of a euro-breakup are uncertain, though Greece may be serving as an unfortunate indicator of what a small state can expect in terms of troubling future history if the world's fragile economic circumstances deteriorate. Greece has witnessed a loss of faith in government and its leaders, leaving state institutions that much weaker. After it announced austerity measures to facilitate debt payment, popular rage forced Greece's former government to resign. Its caretaker government begs for domestic cooperation and international help. Yet local turmoil continues, to include terrorist threats in the name of economic justice and national identity. This anger seeds an ugly intra-European war waged with inflammatory words. Germans are called Nazis, of course, but now the French are also slandered as greedy imperialists. Have-nots in Europe's debt-burdened south reproach the haves (who loaned them money) in Europe's debt-wary north. Greece's shrinking economy has, logically, led to defense budget cuts. The Greek Navy's squadron of German Type 219 submarines is, if not sunk, beached in payment disputes. According to StrategyPage.com, the army may eliminate several brigades. The government, however, does not want to cut back on the regular force's personnel strength because that would increase unemployment. Meanwhile, Greece's traditional foe, Turkey, is buying Type 219s. Despite being NATO allies, military competition with Turkey has shaped Greek defense budgets. Greece can no longer afford it. Defense, of course, is only one element of national security. Besides, Muslim Turkey won't bait Christian Greece, will it? Well, the brewing confrontation over natural gas in Cypriot waters, with Turkish Navy ships shadowing oil exploration vessels, may argue otherwise. Turkey wants the division of Cyprus (a frozen war) resolved before gas production starts. In 2012, Greece is, as stipulated, a small state. If it leaves the euro-zone, Europe's big economies will adjust. If frictions develop over Cyprus, the U.S. would defuse Greco-Turk tensions. That's the betting line. In 1912, however, Balkan resentments ignited the First Balkan War. World War I followed in 1914. Europe's Great Powers failed to adjust. So what happens if the current doldrums get worse, producing a deep, prolonged global depression? The Greek model indicates governments weaken and angry populations get angrier. Desperation creates a political market for the hucksters who peddle quick and easy solutions. When Greece first experienced trouble three years ago, Greek leftists crowed that the time for the workers revolt had finally come, never mind communism's systemic disaster. Small groups of radicals, whatever their agenda, can use media to magnify their strength. Nazis did that in the early 1930s. Today ,international coordination of demonstrations simply requires cell phones. Exploitation of ethnic, nationalist, religious and economic resentments requires a YouTube video. States facing anarchic stress are not only candidates for debt default, but coups and civil war. Rash dictators or jingoist parties, seeking domestic support, may unfreeze a frozen war. What a future -- a powder keg mosaic of destructive little wars, some potentially nuclear.

#### Most recent empirical data proves that interdependence doesn’t check.

Antov 11 [Michael – Department of Political Science at Duke University, “Economic Interdependence and International Conflict: The Implications of Membership in International Economic, Financial, and Monetary Organizations and Multilateral Preferential Trade Agreements”, December 15th, 2011, <http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/5095/2011-12-15%20Milen%20Antov%20Senior%20Thesis.pdf?sequence=1>, Chetan]

In contrast to the liberal arguments, realists have argued that in an anarchic world in which states are solely concerned with preserving their existence, the more interactions among states there are, the higher the likelihood of conflict (Mearsheimer, 1995). That is, **economic interdependence provides** yet another potential **interstate asymmetry and is** thus **a reason for conflict initiation.** Most notably in the economic interdependence – conflict debate, Katherine **Barbieri’s** empirical tests **have shown that bilateral trade increases the probability of** MIDs **(militarized interstate disputes).** (1996, 2001, 2002). Her central claim is that, “rather than inhibiting conflict, extensive economic interdependence increases the likelihood that dyads will engage in militarized interstate disputes” (1996: 29). Barbieri recognizes that low to moderate degrees of interdependence may reduce the likelihood of conflict, but she argues that, the more extensive the linkages become, the more likely interdependence will have the opposite effect. As Maoz points out, another powerful realist theory is that **states’ strategic interests matter more than economic interdependence does – countries can be economically interdependent and still fight over non-economic interests** (2009). Realists have focused on the causes of war and “have emphasized the conflictual aspects of international transactions whereas liberals clearly emphasize the beneficial aspects. From this different starting point, realists come to the conclusion that [economic] interdependence either increases the likelihood of war or is not related to war initiation” (McMillan, 1997: 40). Moreover, it should be noted that realists are above all concerned with war (in terms of armed conflict with at least 25 battle-related deaths or other much higher death thresholds), while liberals have considered a diversity of conflict types, primarily focusing on MIDs.

#### Even conventional strikes would unintentionally spark a global nuclear exchange.

Drum, Staff Writer, ‘10

[Kevin, Mother Jones, Smart, Fearless Journalism, “The Non-Nuclear Nuke,” 4/23, http://motherjones.com/kevin-drum/2010/04/non-nuclear-nuke AD: 4/23/10, Nisarg]

For years the Pentagon has been wrestling with a problem: when you get intel telling you that a high-value terrorist has been located somewhere, how do you take him out? They aren't likely to stick around at the target location for long, so you need something that can (a) get there quickly and (b) cause a lot of damage once it does. Bombers and cruise missiles take hours. Local forces, even if they're in place, aren't always lethal enough. What to do? One answer is to use ICBMs. Not nuclear-tipped ICBMs, but missiles with a big conventional payload. The Obama administration is apparently planning to revive this idea, and Noah Shachtman explains why it's crazy: Over and over again, the Bush administration tried to push the idea of these conventional ICBMs. Over and over again, Congress refused to provide the funds for it. The reason was pretty simple: those anti-terror missiles look and fly exactly like the nuclear missiles we’d launch at Russia or China, in the event of Armageddon. “For many minutes during their flight patterns, these missiles might appear to be headed towards targets in these nations,” a congressional study notes. That could have world-changing consequences. “The launch of such a missile,” then-Russian president Vladimir Putin said in a state of the nation address after the announcement of the Bush-era plan, “could provoke a full-scale counterattack using strategic nuclear forces.” I guess I can imagine possible ways to fix this. I just can't imagine any good ways. Even if the Russians and Chinese and Indians and Pakistanis are provided with some reliable way of identifying non-nuclear ICBM launches, they could never be sure that the United States hadn't figured out some way to fool them. So they'd always be on a short fuse. And do we really want to make that particular fuse even shorter than it already is? Sometimes bad ideas are just bad ideas. This really seems like one of them.

#### Deterrence doesn’t take into account irrational decision-making, global alliances, and hazardous situations – history proves that war is still likely.

Hellman, Professor Emeritus of Electrical Engineering at Stanford University, ‘8

[Martin, “Soaring, Cryptography and Nuclear Weapons,” 10/21/2008, <http://nuclearrisk.org/soaring_article.php>, Nisarg]

A similar situation exists with nuclear weapons. Many people point to the absence of global war since the dawn of the nuclear era as proof that these weapons ensure peace. The MX missile was even christened the Peacekeeper. Just as the laws of physics are used to ensure that a pilot executing a low pass will gain enough altitude to make a safe landing, a law of nuclear deterrence is invoked to quiet any concern over possibly killing billions of innocent people: Since World War III would mean the end of civilization, no one would dare start it. Each side is deterred from attacking the other by the prospect of certain destruction. That's why our current strategy is called nuclear deterrence or mutually assured destruction (MAD). But again, it's important to read the fine print. It is true that no one in his right mind would start a nuclear war, but when people are highly stressed they often behave irrationally and even seemingly rational decisions can lead to places that no one wants to visit. Neither Kennedy nor Khrushchev wanted to teeter on the edge of the nuclear abyss during the 1962 Cuban Missile Crisis, but that is exactly what they did. Less well known nuclear near misses occurred during the Berlin crisis of 1961, the Yom Kippur War of 1973 and NATO's Able Archer exercise of 1983. In each of those episodes, the law of unintended consequences combined with the danger of irrational decision making under stress created an extremely hazardous situation. Because the last date for a nuclear near miss listed above was 1983, it might be hoped that the end of the Cold War removed the nuclear sword hanging over humanity's head. Aside from the fact that other potential crises such as Taiwan were unaffected, a closer look shows that the Cold War, rather than ending, merely went into hibernation. In the West, the reawakening of this specter is usually attributed to resurgent Russian nationalism, but as in most disagreements the other side sees things very differently. The Russian perspective sees the United States behaving irresponsibly in recognizing Kosovo, in putting missiles (albeit defensive ones) in Eastern Europe, and in expanding NATO right up to the Russian border. For our current purposes, the last of these concerns is the most relevant because it involves reading the fine print – in this case, Article 5 of the NATO charter which states that an attack on any NATO member shall be regarded as an attack on them all. It is partly for that reason that a number of former Soviet republics and client states have been brought into NATO and that President Bush is pressing for Georgia and the Ukraine to be admitted. Once these nations are in NATO, the thinking goes, Russia would not dare try to subjugate them again since that would invite nuclear devastation by the United States, which would be treaty bound to come to the victim's aid. But, just as the laws of physics depended on a model that was not always applicable during a glider's low pass, the law of deterrence which seems to guarantee peace and stability is model-dependent. In the simplified model, an attack by Russia would be unprovoked. But what if Russia should feel provoked into an attack and a different perspective caused the West to see the attack as unprovoked? Just such a situation sparked the First World War. The assassination of Austria's Archduke Ferdinand by a Serbian nationalist led Austria to demand that it be allowed to enter Serbian territory to deal with terrorist organizations. This demand was not unreasonable since interrogation of the captured assassins had shown complicity by the Serbian military and it was later determined that the head of Serbian military intelligence was a leader of the secret Black Hand terrorist society. Serbia saw things differently and rejected the demand. War between Austria and Serbia resulted, and alliance obligations similar to NATO's Article 5 then produced a global conflict.

#### Quick breakout means no intervening actors.

Sokolski, Executive Director of the Nonproliferation Policy Education Center, ‘9

[Henry, 6/1/2009, Avoiding a Nuclear Crowd, http://www.hoover.org/publications/policy-review/article/5534]

Finally, several new nuclear weapons contenders are also likely to emerge in the next two to three decades. Among these might be Japan, North Korea, South Korea, Taiwan, Iran, Algeria, Brazil (which is developing a nuclear submarine and the uranium to fuel it), Argentina, and possibly Saudi Arabia (courtesy of weapons leased to it by Pakistan or China), Egypt, Syria, and Turkey. All of these states have either voiced a desire to acquire nuclear weapons or tried to do so previously and have one or more of the following: A nuclear power program, a large research reactor, or plans to build a large power reactor by 2030. With a large reactor program inevitably comes a large number of foreign nuclear experts (who are exceedingly difficult to track and identify) and extensive training, which is certain to include nuclear fuel making.19 Thus, it will be much more difficult to know when and if a state is acquiring nuclear weapons (covertly or overtly) and far more dangerous nuclear technology and materials will be available to terrorists than would otherwise. Bottom line: As more states bring large reactors on line more will become nuclear-weapons-ready — i.e., they could come within months of acquiring nuclear weapons if they chose to do so.20 As for nuclear safeguards keeping apace, neither the iaea’s nuclear inspection system (even under the most optimal conditions) nor technical trends in nuclear fuel making (e.g., silex laser enrichment, centrifuges, new South African aps enrichment techniques, filtering technology, and crude radiochemistry plants, which are making successful, small, affordable, covert fuel manufacturing even more likely)21 afford much cause for optimism. This brave new nuclear world will stir existing security alliance relations more than it will settle them: In the case of states such as Japan, South Korea, and Turkey, it could prompt key allies to go ballistic or nuclear on their own. Nuclear 1914 At a minimum, such developments will be a departure from whatever stability existed during the Cold War. After World War II, there was a clear subordination of nations to one or another of the two superpowers’ strong alliance systems — the U.S.-led free world and the Russian-Chinese led Communist Bloc. The net effect was relative peace with only small, nonindustrial wars. This alliance tension and system, however, no longer exist. Instead, we now have one superpower, the United States, that is capable of overthrowing small nations unilaterally with conventional arms alone, associated with a relatively weak alliance system ( nato) that includes two European nuclear powers (France and the uk). nato is increasingly integrating its nuclear targeting policies. The U.S. also has retained its security allies in Asia (Japan, Australia, and South Korea) but has seen the emergence of an increasing number of nuclear or nuclear-weapon-armed or -ready states. So far, the U.S. has tried to cope with independent nuclear powers by making them “strategic partners” (e.g., India and Russia), nato nuclear allies (France and the uk), “non-nato allies” (e.g., Israel and Pakistan), and strategic stakeholders (China); or by fudging if a nation actually has attained full nuclear status (e.g., Iran or North Korea, which, we insist, will either not get nuclear weapons or will give them up). In this world, every nuclear power center (our European nuclear nato allies), the U.S., Russia, China, Israel, India, and Pakistan could have significant diplomatic security relations or ties with one another but none of these ties is viewed by Washington (and, one hopes, by no one else) as being as important as the ties between Washington and each of these nuclear-armed entities (see Figure 3). There are limits, however, to what this approach can accomplish. Such a weak alliance system, with its expanding set of loose affiliations, risks becoming analogous to the international system that failed to contain offensive actions prior to World War I. Unlike 1914, there is no power today that can rival the projection of U.S. conventional forces anywhere on the globe. But in a world with an increasing number of nuclear-armed or nuclear-ready states, this may not matter as much as we think. In such a world, the actions of just one or two states or groups that might threaten to disrupt or overthrow a nuclear weapons state could check U.S. influence or ignite a war Washington could have difficulty containing. No amount of military science or tactics could assure that the U.S. could disarm or neutralize such threatening or unstable nuclear states.22 Nor could diplomats or our intelligence services be relied upon to keep up to date on what each of these governments would be likely to do in such a crisis (see graphic below): Combine these proliferation trends with the others noted above and one could easily create the perfect nuclear storm: Small differences between nuclear competitors that would put all actors on edge; an overhang of nuclear materials that could be called upon to break out or significantly ramp up existing nuclear deployments; and a variety of potential new nuclear actors developing weapons options in the wings. In such a setting, the military and nuclear rivalries between states could easily be much more intense than before. Certainly each nuclear state’s military would place an even higher premium than before on being able to weaponize its military and civilian surpluses quickly, to deploy forces that are survivable, and to have forces that can get to their targets and destroy them with high levels of probability. The advanced military states will also be even more inclined to develop and deploy enhanced air and missile defenses and long-range, precision guidance munitions, and to develop a variety of preventative and preemptive war options. Certainly, in such a world, relations between states could become far less stable. Relatively small developments — e.g., Russian support for sympathetic near-abroad provinces; Pakistani-inspired terrorist strikes in India, such as those experienced recently in Mumbai; new Indian flanking activities in Iran near Pakistan; Chinese weapons developments or moves regarding Taiwan; state-sponsored assassination attempts of key figures in the Middle East or South West Asia, etc. — could easily prompt nuclear weapons deployments with “strategic” consequences (arms races, strategic miscues, and even nuclear war). As Herman Kahn once noted, in such a world “every quarrel or difference of opinion may lead to violence of a kind quite different from what is possible today.”23 In short, we may soon see a future that neither the proponents of nuclear abolition, nor their critics, would ever want. None of this, however, is inevitable.

#### Shorter flight times and lack of second strike capacity make miscalculation more likely. Also, answers counterforce checking.

Cimbala 8 (Stephen, Political Science Professor at the University of Pennsylvania, March, “Anticipatory Attacks: Nuclear Crisis Stability in Future Asia” Comparative Strategy, Vol 27 No 2, p 113-132, InformaWorld)

The spread of nuclear weapons in Asia presents a complicated mosaic of possibilities in this regard. States with nuclear forces of variable force structure, operational experience, and command-control systems will be thrown into a matrix of complex political, social, and cultural crosscurrents contributory to the possibility of war. In addition to the existing nuclear powers in Asia, others may seek nuclear weapons if they feel threatened by regional rivals or hostile alliances. Containment of nuclear proliferation in Asia is a desirable political objective for all of the obvious reasons. Nevertheless, the present century is unlikely to see the nuclear hesitancy or risk aversion that marked the Cold War, in part, because the military and political discipline imposed by the Cold War superpowers no longer exists, but also because states in Asia have new aspirations for regional or global respect.12 The spread of ballistic missiles and other nuclear-capable delivery systems in Asia , or in the Middle East with reach into Asia, is especially dangerous because plausible adversaries live close together and are already engaged in ongoing disputes about territory or other issues.13 The Cold War Americans and Soviets required missiles and airborne delivery systems of intercontinental range to strike at one another's vitals. But short-range ballistic missiles or fighter-bombers suffice for India and Pakistan to launch attacks at one another with potentially “strategic” effects. China shares borders with Russia, North Korea, India, and Pakistan; Russia, with China and North Korea; India, with Pakistan and China; Pakistan, with India and China; and so on. The short flight times of ballistic missiles between the cities or military forces of contiguous states means that very little time will be available for warning and attack assessment by the defender. Conventionally armed missiles could easily be mistaken for a tactical nuclear first use. Fighter-bombers appearing over the horizon could just as easily be carrying nuclear weapons as conventional ordnance. In addition to the challenges posed by shorter flight times and uncertain weapons loads, potential victims of nuclear attack in Asia may also have first strike-vulnerable forces and command-control systems that increase decision pressures for rapid, and possibly mistaken, retaliation. This potpourri of possibilities challenges conventional wisdom about nuclear deterrence and proliferation on the part of policymakers and academic theorists. For policymakers in the United States and NATO, spreading nuclear and other weapons of mass destruction in Asia could profoundly shift the geopolitics of mass destruction from a European center of gravity (in the twentieth century) to an Asian and/or Middle Eastern center of gravity (in the present century).14 This would profoundly shake up prognostications to the effect that wars of mass destruction are now passe, on account of the emergence of the “Revolution in Military Affairs” and its encouragement of information-based warfare.15 Together with this, there has emerged the argument that large-scale wars between states or coalitions of states, as opposed to varieties of unconventional warfare and failed states, are exceptional and potentially obsolete.16 The spread of WMD and ballistic missiles in Asia could overturn these expectations for the obsolescence or marginalization of major interstate warfare. For theorists, the argument that the spread of nuclear weapons might be fully compatible with international stability, and perhaps even supportive of international security, may be less sustainable than hitherto.17 Theorists optimistic about the ability of the international order to accommodate the proliferation of nuclear weapons and delivery systems in the present century have made several plausible arguments based on international systems and deterrence theory. First, nuclear weapons may make states more risk averse as opposed to risk acceptant, with regard to brandishing military power in support of foreign policy objectives. Second, if states' nuclear forces are second-strike survivable, they contribute to reduced fears of surprise attack. Third, the motives of states with respect to the existing international order are crucial. Revisionists will seek to use nuclear weapons to overturn the existing balance of power; status quo-oriented states will use nuclear forces to support the existing distribution of power, and therefore, slow and peaceful change, as opposed to sudden and radical power transitions. These arguments, for a less alarmist view of nuclear proliferation, take comfort from the history of nuclear policy in the “first nuclear age,” roughly corresponding to the Cold War.18 Pessimists who predicted that some thirty or more states might have nuclear weapons by the end of the century were proved wrong. However, the Cold War is a dubious precedent for the control of nuclear weapons spread outside of Europe. The military and security agenda of the Cold War was dominated by the United States and the Soviet Union, especially with regard to nuclear weapons. Ideas about mutual deterrence based on second-strike capability and the deterrence “rationality” according to American or allied Western concepts might be inaccurate guides to the avoidance of war outside of Europe.19

#### Most recent evidence proves that even a limited nuke war turns their impacts and results in extinction.

Starr 12

[Steven Starr - Director of the Clinical Laboratory Science Program at the University of Missouri-Columbia, Associate member of the Nuclear Age Peace Foundation, has been published by the Bulletin of the Atomic Scientists, his writings appear on the websites of the Nuclear Age Peace Foundation, the Moscow Institute of Physics and Technology Center for Arms Control, Energy and Environmental Studies, Scientists for Global Responsibility, and the International Network of Scientists Against Proliferation, “What is nuclear darkness?,” <http://www.nucleardarkness.org/web/whatisnucleardarkness/>]

In a nuclear war, burning cities would create millions of tons of thick, black smoke. This smoke would rise above cloud level, into the stratosphere, where it would quickly spread around the planet. A large nuclear war would produce enough smoke to block most sunlight from reaching the Earth's surface. Massive absorption of warming sunlight by a global stratospheric smoke layer would rapidly create Ice Age temperatures on Earth . The cold would last a long time; NASA computer models predict 40% of the smoke would still remain in the stratosphere ten years after a nuclear war. Half of 1% of the explosive power of US-Russian nuclear weapons can create enough nuclear darkness to impact global climate. 100 Hiroshima-size weapons exploded in the cities of India and Pakistan would put up to 5 million tons of smoke in the stratosphere . The smoke would destroy much of the Earth's protective ozone layer and drop temperatures in the Northern Hemisphere to levels last seen in the Little Ice Age. Shortened growing seasons could cause up to 1 billion people to starve to death. A large nuclear war could put 150 million tons of smoke in the stratosphere and make global temperatures colder than they were 18,000 years ago during the coldest part of the last Ice Age. Killing frosts would occur every day for 1-3 years in the large agricultural regions of the Northern Hemisphere. Average global precipitation would be reduced by 45%. Earth's ozone layer would be decimated. Growing seasons would be eliminated. A large nuclear war would utterly devastate the environment and cause most people to starve to death . Deadly climate change, radioactive fallout and toxic pollution would cause already stressed ecosystems to collapse. The result would be a mass extinction event that would wipe

### Warming

#### Investments in nuclear power trade off with investment in renewables – renewables key to halt warming

Carbon Control News 7/7/2008 “Activists make new economic case against nuclear's climate benefits”, lexis

A number of new reports have emerged arguing that investments in nuclear power could contribute to climate change, rather than reduce carbon dioxide (CO2) emissions, because those investments would divert limited resources from more cost-effective clean energy alternatives. The reports aim to counter the nuclear industry's inroads in casting nuclear power as a solution to global warming and highlight the contentious nature of the debate over what role -- if any -- nuclear should play in federal polices to address climate change.  Presumptive Republican presidential nominee John McCain (AZ) has said his administration would seek to build 45 new nuclear power plants by 2030 in order to stave off the worst effects of global warming. Meanwhile, industry officials point out that nuclear power is currently the largest source of low-carbon power in the United States. Nuclear plants are also "the lowest-cost producer of base-load electricity," according to the Nuclear Energy Institute (NEI), with the costs of operating a plant amounting to 1.76 cents per kilowatt-hour.  But environmentalists are increasingly citing rising construction costs and lingering concerns surrounding the disposal of radioactive nuclear waste to claim nuclear energy is not a long-term solution to climate change. And some environmentalists are now arguing that by diverting resources from more cost-effective renewable and energy efficiency investments, proponents of nuclear energy may actually be making attempts to mitigate global warming more difficult. Yet in a recent article for the conservative Heritage Foundation, Jack Spencer and Nick Loris write that, "Nuclear power must be expanded if CO2 caps are to work." They argue that unlike wind and solar power, which are intermittent and incapable of providing consistent base-load energy, nuclear power is capable of meeting growing demand for energy without emitting greenhouse gases.  While environmentalists point to the high costs of constructing a plant, the authors maintain those costs are not as high when considered in the context of the full lifetime operation of a nuclear plant. In fact, they write that, "Given the low cost needed to operate a nuclear plant, lifetime costs are very low once the plant has been constructed. It is therefore difficult to conclude that wind or solar power should be built at all."  Currently, NEI estimates construction costs for a new nuclear plant to be between $6 billion and $7 billion, while the utility company Florida Power & Light, which has plans to construct two new nuclear reactors, recently estimated that costs for a single reactor could be as high as $12 billion. But Spencer and Loris write that, "Additional production will allow these costs to be spread, thus lowering costs overall. Further savings should be achieved by applying lessons learned from initial construction projects. Because nuclear plants could have an operating life of 80 years, the benefit could be well worth the cost."  But those arguments have prompted a rebuttal from environmentalists and some economists. In a paper recently released by the environmental think tank Rocky Mountain Institute, "The Nuclear Illusion," Amory Lovins and Imran Sheikh concede that nuclear power, at least from a climate change perspective, far outperforms coal power, which currently provides around half of U.S. electricity. But the authors argue that nuclear power's decentralized, low-carbon competitors -- wind, solar, hydro, and cogeneration power -- can displace more coal power per dollar at a faster pace.  "New nuclear power costs far more than its distributed competitors, so it buys far less coal displacement per dollar than the competing investments it stymies," the authors write. "And its higher relative cost than nearly all competitors, per unit of net CO2 displaced, means that every dollar invested in nuclear expansion will worsen climate change by buying less solution per dollar."  Sheikh tells Carbon Control News that he and Lovins wrote the article, in part, because, "We're seeing this perceived resurgence in nuclear power because it's carbon-zero, or roughly carbon-zero, and since climate change is becoming such a hot topic." The paper was released now, Sheikh says, as a way to counter the increased focus on nuclear power as an answer to climate change, and to show "we can offer more climate protection for less money" by pursing efficiency and small, decentralized electricity production -- what is termed "micropower." His advice for lawmakers? "Just let all types of generation and efficiency compete on a level playing field, and when that happens micropower will probably win."  That is an argument Sheikh and Lovins repeatedly make in their paper: let investors choose energy sources, not politicians, because subsidies will only distort the market and possibly delay effective action on climate change. The authors argue that "full U.S. deployment" of decentralized micropower, including recovered waste-heat cogeneration and wind power, and end-use efficiency measures could replace much of nuclear energy's current U.S. market share "without significant land-use, reliability, or other constraints, and with considerable gains in employment" -- and without federal subsidies.  In April testimony before the House Select Committee on Global Warming and Energy Independence, Lovins noted that nuclear energy has attracted "no private risk capital despite U.S. taxpayer subsidies that can now total about $13 billion per new nuclear plant--roughly its entire cost." While politicians may decide to approve further subsidies for nuclear, "Heroic efforts at near- or over-100% subsidization will continue to elicit the same response as defibrillating a corpse: it will jump, but it won't revive."

#### Too late to solve - 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.

#### Alt causes -

#### A. Deforestation

Howden 7(Daniel Howden, The Independent “Deforestation: The Hidden Cause of Global Warming” 14 May 2007. DOA August 15, 12 sphinx.tsf.hu/new/iny/files/1645.doc)

**Most people think of forests** only in terms of the CO2 they absorb. The rainforests of the Amazon, the Congo basin and Indonesia are thought of **as the lungs of the planet.** But **the destruction of those forests will in the next four years** alone, in the words of Sir Nicholas Stern, **pump more CO2 into the atmosphere than every flight in the history of aviation to at least 2025.¶** Indonesia became the third-largest emitter of greenhouse gases in the world last week. Following close behind is Brazil. Neither nation has heavy industry on a comparable scale with the EU, India or Russia and yet they comfortably outstrip all other countries, except the United States and China.¶ What both countries do have in common is tropical forest that is being cut and burned with staggering swiftness. Smoke stacks visible from space climb into the sky above both countries, while satellite images capture similar destruction from the Congo basin, across the Democratic Republic of Congo, the Central African Republic and the Republic of Congo.¶ According to the latest audited figures from 2003, **two billion tons of CO2 enters the atmosphere** every year **from deforestation.** That destruction amounts to 50 million acres - or an area the size of England, Wales and Scotland felled **annually.¶** The remaining standing forest is calculated to contain 1,000 billion tons of carbon, or double what is already in the atmosphere.¶ As the GCP's report concludes: **"If we lose forests, we lose the fight against climate change."**

#### B. Live stock

FAO 6 ("Spotlight: Livestock Impacts on the Environment." FAO: FAO Home. Food and Agriculture Organization of the United Nations, Nov. 2006. Web. 15 August 12. <<http://www.fao.org/ag/magazine/0612sp1.htm>>.)

The livestock sector is by far the single largest anthropogenic user of land. Grazing occupies 26 percent of the Earth's terrestrial surface, while feed crop production requires about a third of all arable land. Expansion of grazing land for livestock is a key factor in deforestation, especially in Latin America: some 70 percent of previously forested land in the Amazon is used as pasture, and feed crops cover a large part of the reminder. About 70 percent of all grazing land in dry areas is considered degraded, mostly because of overgrazing, compaction and erosion attributable to livestock activity.¶ At the same time, the livestock sector has assumed an often unrecognized role in global warming. Using a methodology that considered the entire commodity chain *(see box below)*, FAO estimated that livestock are responsible for 18 percent of greenhouse gas emissions, a bigger share than that of transport. It accounts for nine percent of anthropogenic carbon dioxide emissions, most of it due to expansion of pastures and arable land for feed crops. It generates even bigger shares of emissions of other gases with greater potential to warm the atmosphere: as much as 37 percent of anthropogenic methane, mostly from enteric fermentation by ruminants, and 65 percent of anthropogenic nitrous oxide, mostly from manure.

#### Nuclear power produces heat emissions which exacerbate global warming

Science Daily 9 (July 13th, Trapping Carbon Dioxide Or Switching To Nuclear Power Not Enough To Solve Global Warming Problem, Experts Say, http://www.sciencedaily.com/releases/2009/07/090713085248.htm)

Attempting to tackle climate change by trapping carbon dioxide or switching to nuclear power will not solve the problem of global warming, according to energy calculations published in the July issue of the International Journal of Global Warming. Bo Nordell and Bruno Gervet of the Department of Civil and Environmental Engineering at Luleå University of Technology in Sweden have calculated the total energy emissions from the start of the industrial revolution in the 1880s to the modern day. They have worked out that using the increase in average global air temperature as a measure of global warming is an inadequate measure of climate change. They suggest that scientists must also take into account the total energy of the ground, ice masses and the seas if they are to model climate change accurately. The researchers have calculated that the heat energy accumulated in the atmosphere corresponds to a mere 6.6% of global warming, while the remaining heat is stored in the ground (31.5%), melting ice (33.4%) and sea water (28.5%). They point out that net heat emissions between the industrial revolution circa 1880 and the modern era at 2000 correspond to almost three quarters of the accumulated heat, i.e., global warming, during that period. Their calculations suggest that most measures to combat global warming, such as reducing our reliance on burning fossil fuels and switching to renewables like wind power and solar energy, will ultimately help in preventing catastrophic climate change in the long term. But the same calculations also show that trapping carbon dioxide, so-called carbon dioxide sequestration, and storing it deep underground or on the sea floor will have very little effect on global warming. "Since net heat emissions accounts for most of the global warming there is no or little reason for carbon dioxide sequestration," Nordell explains, "The increasing carbon dioxide emissions merely show how most net heat is produced. The "missing" heat, 26%, is due to the greenhouse effect, natural variations in climate and/or an underestimation of net heat emissions, the researchers say. These calculations are actually rather conservative, the researchers say, and the missing heat may be much less. The researchers also point out a flaw in the nuclear energy argument. Although nuclear power does not produce carbon dioxide emissions in the same way as burning fossil fuels it does produce heat emissions equivalent to three times the energy of the electricity it generates and so contributes to global warming significantly, Nordell adds.

#### SMR’s take till 2050 – too late to solve warming.

PR Newswire ’10 (PR Newswire, “IEER/PSR: 'Small Modular Reactors' No Panacea for What Ails Nuclear Power”, <http://www.prnewswire.com/news-releases/ieerpsr-small-modular-reactors-no-panacea-for-what-ails-nuclear-power-104024223.html>, September 29, 2010, LEQ)

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

#### Warming will not hurt agriculture- consensus of warrants prove

**Singer 7** (Singer, distinguished research professor at George Mason and Avery, director of the Center for Global Food Issues at the Hudson Institute, 2007 (S. Fred, Dennis T, “Unstoppable Global Warming: Every 1,500 Years” Pages 120-124)

FIVE REASONS NOT TO FEAR FAMINE DURING GLOBAL WARMING First: Lessons of History Human food production, historically, has prospered during the global warmings. We have seen in the earlier chapters the flourishing of human society during the Roman Warming and the Medieval Warming. Food production increased during previous historic warmings primarily because warming climates provided more of the things plants love: sunlight, rainfall, and longer growing seasons. During warmings there are also less of the things plants hate: late spring frosts and early fall frosts that shorten the growing season, and hailstorms that destroy fields of crops. Jorgen Olesen of the Danish Institute of Agricultural Sciences predicts that Europe's overall food production will increase with warming, even though some southern European regions will have crops reduced by aridity." Second: What Science Says about Food and the Modern Warming Sunshine: Richard Willson of Columbia University (and NASA) has measured an increase in the sun's radiance of 0.05 percent per decade for the past two decades. He says the upward trend in sunlight may well have been going on longer than that. Earlier, we didn't have the precision instruments to measure that small but vital trend, but every bit of it encourages the growth of food crops.: The increased temperatures of the Modern Warming may have some negative impact on crops in the southern mid-latitudes-through drier summers, for example-in places such as southern Romania, Spain, and Texas. At the same time, however, stronger sunlight will importantly increase the productivity of farmland in the northern mid-latitudes, such as Germany, Canada, and Russia. The increased food production in the very extensive northern plains would far outweigh the negative impact of slightly more arid conditions in the southern mid-latitudes. Rainfall: Increased heat means more precipitation, as more moisture evaporates from the oceans and then falls as rain or snow. NASA says global rainfall increased 2 percent in the twentieth century compared with the tailend of the Little Ice Age in the nineteenth century. Most of the increased moisture fell in the mid- and high-latitudes where much of the world's most productive cropland is located. We can expect this to continue through the \Iodern Warming. Higher CO2 Levels: Another reason food production has tended to increase during the past 150 years is that CO2 levels in the atmosphere have increased. The oceans give up CO2 when they warm. The increased CO2 not only fertilizes the plants, but enables them to use water more efficiently. Researchers at the U.S. Department of Agriculture in 1997 grew wheat in a long plastic tunnel, varying the CO2 levels for the grain plants from the Ice Age CO2 level of about 200 parts per million (ppm) at one end of the tunnel to the late-1980s level of 350 ppm at the other.' The findings? An extra 100 ppm of CO2 increased the wheat production by 72 percent under well-watered conditions, and by 48 percent under semidrought conditions. That meant an average crop yield gain of 60 percent. These results are consistent with a wide variety of CO2 enrichment studies done in more than a dozen countries on many different crops. Third: Farming Technology Human food production today depends far more on farming technology than on modest climate changes. We are no more doomed to famine by the Modern Warming than we are doomed to malaria in the era of pesticides and window screens. In fact, the food abundance the world has increasingly enjoyed since the eighteenth century is primarily due to scientific and technological advances. In 1500, Britain could feed less than one million people. By 1850, thanks to knowledge of crop rotations and improved farm machines such as the seeder and reaper, Britain fed more than 16 million people. Today, Britain has nearly 60 million people, fed mainly from its own fields. Todau'e "Climate-Secure" Agriculture Industrial nitrogen fertilizer is one of the biggest farming advances in human history. Before 1908, farmers could only maintain their soil nutrient levels by adding livestock manure or by growing more green-manure crops, such as clover. Both of those strategies require lots of land. In 1908, however, the Haber-Bosch Process began taking nitrogen from the air, which is 78 percent nitrogen. Today's farmers apply about 80 million tons of industrial nitrogen per year to maintain their soils' fertility and it doesn't cost a single acre ofland. To get 80 million tons per year of nitrogen from cattle manure, the world would require nearly eight billion additional cattle, plus five acres or so of forage land per beast. We'd thus have to eliminate half the people, clear all the forests, or use some combination of those strategies. The Green Revolution of the 1960s tripled the crop yields across Europe and much of the Third World. • More powerful seeds, many of them with resistance to drought and pests, made better use of the complete roster of plant nutrients (nitrogen, phosphate, and potash-plus twenty-six trace mineral elements) that soil-testing modern farmers apply to their fields. • Irrigation assures ample moisture, often even in semiarid areas. • Insecticides and fungicides protect the high yields of the crops both during the growing season and in storage. In America, where high-yield farming started earlier, diaries of early settlers in Virginia's Shenandoah Valley indicate that wheat yields around 1800 were only six to seven bushels per acre. The valley's farmers today often get ten times that yield. U.S. corn yields by the 1920s had risen to about twentyfive bushels per acre. Today, the national average is more than 140 bushels, and still rising. The same story of soaring yields and more certain harvests is playing out today over most of the world. The African Exception Africa is the only place in the world where per capita food production has not been increasing in recent decades. Africa's food production has been severely hampered by its ancient soils, frequent droughts, and abundant insects and diseases. There has also been a lack of adequate research for its specific soils, microcJimates, and pests-and an equally damaging lack of stable governance and infrastructure on that continent. Two recent research developments are now particularly helpful for Africa . • Quality-protein (QP) maize, bred in Mexico's International Maize and Wheat Improvement Center, not only has higher yields but also provides more lysine and tryptophan, two amino acids that are critical for human nutrition but are lacking in most corn varieties. The QP maize is able by itself to cure many Afncan children of malnutrition . • Rice breeders have successfully wide-crossed the African native rice species with Asian rice varieties, to create a family of more vigorous and higher-yield new rice varieties. More such breakthroughs for Africa's farmers can be expected if more research investments are made for and in that continent. Better roads and bridges (and better national security) would also make farm inputs less expensive and higher crop yields more marketable no matter what happens to its climate. Today s high-yield agriculture is also the most sustainable in history, thanks t,) fertilizers, soil testing, and a twentieth-century farming system called "con-crvation tillage." Conservation tillage controls weeds with cover crops and cncmical herbicides instead of by plowing, which invites soil erosion. The ..:,)nservation farmer just discs up the top two or three inches of topsoil along \\ ith the stalks and residue from the previous crop. This process creates trili ions of tiny dams that prevent wind or water erosion. The little dams also encourage water to infiltrate the root zone of the field, instead of running off mto the nearest stream. Conservation tillage cuts soil erosion by 65 to 95 percent and often doubles the soil moisture in the field. It encourages far more soil bacteria and earthworms, both because of the constant heavy supply of crop residues for them to eat and because they hate being plowed, as they are in conventional and organic farmers' fields. Through the expanded use of conservation tillage across the United States, Canada, South America, Australia and, most recently, South Asia, hundreds of millions of acres are now sustainably more productive than ever before in history. Another fruitful use of technology and increased sustainability will be more efficient irrigation. Primitive flood irrigation systems in the Third World use water at less than 40 percent efficiency. Center-pivot irrigation systems with trailing plastic tubes to deliver water right at the roots (minimizing evaporation) and computer-controlled to apply just the right amount of moisture to each part of the field, can approach 90 percent water efficiency. World farmers currently use about 70 percent of the fresh water humanity "uses up." As water becomes more valuable, the capital investments in high-efficiency irrigation systems will be justified. Fourth: The Future and Biotechnology Today's crop yields are the product of more than two hundred years of conventional trial-and-error science. But, by 2050 the world will have some seven billion affluent humans demanding the high-quality diets that only about one billion people are able to afford today. We'll also have to feed far more pets. That means world food demand will more than double, and we're already farming half of the Earth's available land. Additional sources of higher crop and livestock yields will be needed. The world is already using plant breeding, fertilizers, irrigation, and pesticides. However, the world is only beginning to use biotechnology, our new-found understanding of Nature's genetic codes. The first broad application of biotechnology in agriculture has been to make plants tolerant of synthetic herbicides, so we could use the environmentally safest herbicides to protect our crops more effectively from weed competition. As a result we have somewhat raised crop yields and lowered food costs in many countries. It also happens that one of Africa's worst endemic pests is a parasitic weed called witchweed. It invades corn and sorghum plants through their roots, and the farmer never knows it's there until his crop stalk suddenly sprouts a bright red witch weed flower instead of an ear of grain. Genetically engineered herbicide-tolerant seeds could have solved the problem. With the seed soaked in herbicide, the witchweed would have been killed as it invaded the plant roots, and the grain would have thrived. Unfortunately, activists and European governments threatened retaliation against any African government that allowed the planting of biotech-modified crops. Now, researchers have done a genetically researched end run around the biotech Luddites. Pioneer Hi-Bred identified corn seeds with a natural tolerance for the herbicide imazopyr, and donated the germ plasm to the International Maize and Wheat Improvement Center (CIMMYT) in Mexico. CIMMYT, in turn, has bred the herbicide tolerance into African corn varieties. Corn yields are four times as high. The technology is low cost and easy for even Africa's small farms to use. Biotechnology (BT) has also allowed plant researchers to put an ultra-safe natural insecticide found in soils into such crop plants as corn and cotton. Because of these pest-resistant plants, millions of pounds of pesticide no longer have to be sprayed into the environment or pose hazards to beneficial insects. BT cotton and corn are being planted by millions of small farmers, especially in China and India. An important second-generation benefit of biotechnology is finding wild natural genes that can improve our crop plants. We already have one such important breakthrough. Plant explorers nearly fifty years ago found a relative of the wild potato that was resistant to the infamous late blight virus that caused the Irish potato famine in the 1840s. Unfortunately, plant breeders were never able to successfully cross that blight resistance gene into an edible, productive domestic potato. Now, three different universities have spliced the blight resistance gene into new potato varieties. This will be especially important for densely populated parts of Asia and Africa (such as Rwanda and Bangladesh) that have become more dependent on the potato's ability to produce more food per acre than any other crop. Black Sigatoka, a new bacterial disease of bananas and plantains (important staples in much of Africa) has been spreading worldwide. Unfortunately, bananas are especially difficult to cross-breed. Fortunately, biotechnology has now produced plants resistant to Black Sigatoka, protecting the tenuous food security of tropical and subtropical Africa. Plant ,esea,che" alsn bel;eve that b;ntechnnlogy is the most J;kely path towaed drought-tolemnt c,ops, wh;ch would be hugely ;mponant;n deal;ng witf any long-te'm d,ought p'oblems brought by the Modem Waeming. Egypt has al,eady ;nsened a drought-tolemnce gene from the barley plant into wheat, produe;ng vaeieHes that need only a single ;"igat;on per crop instead of eight. The drought-tol"ant wheat wil! not only take less wal". but wil! sha'ply ;educe sa];n;zaHnn of the ;";gated land on wh;ch it's grown. It should also be a boon on large areas of good quality land where rainfall is scarce. Fifth: Modern Transportation The biggest technical advantage of the modem world in dealing with weather famines is modern transportation. In the Coming warming centuries, we will undoubtedly be able to produce enough food from the land that gets good weather in any given yea; to supply all of the world's food needs. Equally important, We will be able to store food safely from years of plenty to ensure food abundance in lean years, all it takes are inexpensive concrete silos and modern pesticides to keep the rats and bugs from feasting on Our food reserves before We need to draw on them.

#### 3 periods of rapid warming show no extinctions- models are flawed guesswork

NIPCC 11(Nongovernmental International Panel on Climate Change, “2011 Interim Report from the Nongovernmental International Panel on Climate Change,” http://nipccreport.org/reports/2011/2011report.html)

The first period they examined was the Eocene Climatic Optimum (53–51 million years ago), when the atmosphere‘s CO2 concentration exceeded 1,200 ppm and tropical temperatures were 5–10°C warmer than modern values. Yet far from causing extinctions of the tropical flora (where the data are best), the four researchers report ―all the evidence from low-latitude records indicates that, at least in the plant fossil record, this was one of the most biodiverse intervals of time in the Neotropics.‖ They also note ―ancestors of many of our modern tropical and temperate plants evolved ...when global temperatures and CO2 were much higher than present ... indicating that they have much wider ecological tolerances than are predicted based on present-day climates alone.‖ The second period they examined included two rapid-change climatic events in the Holocene—one at 14,700 years ago and one at 11,600 years ago—when temperatures increased in the mid- to high-latitudes of the Northern Hemisphere by up to 10°C over periods of less than 60 years. There is evidence from many sites for rapid plant responses to rapid warming during these events. The researchers note ―at no site yet studied, anywhere in the world, is there evidence in the fossil record for large-scale climate-driven extinction during these intervals of rapid warming.‖ On the other hand, they report extinctions did occur due to the cold temperatures of the glacial epoch, when subtropical species in southern Europe were driven out of their comfort zone. The Willis et al. study also makes use of recent historical data, as in the case of the 3°C rise in temperature at Yosemite Park over the past 100 years. In comparing surveys of mammal fauna conducted near the beginning and end of this period, they detected some changes but no local extinctions. Thus they determined that for all of the periods they studied, with either very warm temperatures or very rapid warming, there were no detectable species extinctions. In a study that may help explain how some researchers could have gotten things so wrong in predicting massive extinctions of both plants and animals in response to projected future warming, Nogues-Bravo (2009) explains the climate envelope models (CEMs)—often employed to predict species responses to global warming (and whether or not a species will be able to survive projected temperature increases)—―are sensitive to theoretical assumptions, to model classes and to projections in non-analogous climates, among other issues.‖ To determine how appropriate these models are for determining whether a particular species will be driven to extinction by hypothesized planetary warming, Nogues-Bravo reviewed the scientific literature pertaining to the subject and found several flaws. Nogues-Bravo writes, ―the studies reviewed: (1) rarely test the theoretical assumptions behind niche modeling such as the stability of species climatic niches through time and the equilibrium of species with climate; (2) they only use one model class (72% of the studies) and one palaeoclimatic reconstruction (62.5%) to calibrate their models; (3) they do not check for the occurrence of non-analogous climates (97%); and (4) they do not use independent data to validate the models (72%).‖ Nogues-Bravo writes, ―ignoring the theoretical assumptions behind niche modeling and using inadequate methods for hindcasting can produce ―a cascade of errors and naïve ecological and evolutionary inferences. Hence, he concludes, ―there are a wide variety of challenges that CEMs must overcome in order to improve the reliability of their predictions through time. Until these challenges are met, contentions of impending species extinctions must be considered little more than guesswork (see also Chapman, 2010).

#### Multiple scientific studies prove that their acidification impact is false – newest research

WSJ 12 (Wall Street Journal, “Taking Fears of Acid Oceans With a Grain of Salt,” 1/7/2012, <http://online.wsj.com/article/SB10001424052970203550304577138561444464028.html>, NP)

Coral reefs around the world are suffering badly from overfishing and various forms of pollution. Yet many experts argue that the greatest threat to them is the acidification of the oceans from the dissolving of man-made carbon dioxide emissions. The effect of acidification, according to J.E.N. Veron, an Australian coral scientist, will be "nothing less than catastrophic.... What were once thriving coral gardens that supported the greatest biodiversity of the marine realm will become red-black bacterial slime, and they will stay that way." This is a common view. The Natural Resources Defense Council has called ocean acidification "the scariest environmental problem you've never heard of." Sigourney Weaver, who narrated a film about the issue, said that "the scientists are freaked out." The head of the National Oceanic and Atmospheric Administration calls it global warming's "equally evil twin." But do the scientific data support such alarm? Last month scientists at San Diego's Scripps Institution of Oceanography and other authors published a study showing how much the pH level (measuring alkalinity versus acidity) varies naturally between parts of the ocean and at different times of the day, month and year. "On both a monthly and annual scale, even the most stable open ocean sites see pH changes many times larger than the annual rate of acidification," say the authors of the study, adding that because good instruments to measure ocean pH have only recently been deployed, "this variation has been under-appreciated." Over coral reefs, the pH decline between dusk and dawn is almost half as much as the decrease in average pH expected over the next 100 years. The noise is greater than the signal. Another recent study, by scientists from the U.K., Hawaii and Massachusetts, concluded that "marine and freshwater assemblages have always experienced variable pH conditions," and that "in many freshwater lakes, pH changes that are orders of magnitude greater than those projected for the 22nd-century oceans can occur over periods of hours." This adds to other hints that the ocean-acidification problem may have been exaggerated. For a start, the ocean is alkaline and in no danger of becoming acid (despite headlines like that from Reuters in 2009: "Climate Change Turning Seas Acid"). If the average pH of the ocean drops to 7.8 from 8.1 by 2100 as predicted, it will still be well above seven, the neutral point where alkalinity becomes acidity. The central concern is that lower pH will make it harder for corals, clams and other "calcifier" creatures to make calcium carbonate skeletons and shells. Yet this concern also may be overstated. Off Papua New Guinea and the Italian island of Ischia, where natural carbon-dioxide bubbles from volcanic vents make the sea less alkaline, and off the Yucatan, where underwater springs make seawater actually acidic, studies have shown that at least some kinds of calcifiers still thrive—at least as far down as pH 7.8. In a recent experiment in the Mediterranean, reported in Nature Climate Change, corals and mollusks were transplanted to lower pH sites, where they proved "able to calcify and grow at even faster than normal rates when exposed to the high [carbon-dioxide] levels projected for the next 300 years." In any case, freshwater mussels thrive in Scottish rivers, where the pH is as low as five. Laboratory experiments find that more marine creatures thrive than suffer when carbon dioxide lowers the pH level to 7.8. This is because the carbon dioxide dissolves mainly as bicarbonate, which many calcifiers use as raw material for carbonate. Human beings have indeed placed marine ecosystems under terrible pressure, but the chief culprits are overfishing and pollution. By comparison, a very slow reduction in the alkalinity of the oceans, well within the range of natural variation, is a modest threat, and it certainly does not merit apocalyptic headlines.

#### No extinction from diseases – natural selection checks.

Posner, ‘5

[Richard, Court of Appeals Judge: Professor, Chicago School of Law, Catastrophe, http://goliath.ecnext.com/coms2/gi\_0199-4150331/Catastrophe-the-dozen-most-significant.html]

Yet the fact that **Homo sapiens has managed to survive every disease** to assail it **in** the **200,000 years** or so of its existence is a source of genuine comfort, at least if the focus is on extinction events. There have been enormously destructive plagues, such as the Black Death, smallpox, and now AIDS, **but none has come close to destroying the** entire **human race**. There is a biological reason. **Natural selection favors germs of limited lethality**; they are fitter in an evolutionary sense because their genes are more likely to be spread if the germs do not kill their hosts too quickly. The AIDS virus is an example of a lethal virus, wholly natural, that by lying dormant yet infectious in its host for years maximizes its spread. Yet **there is no danger that AIDS wil**l destroy the entire human race. The likelihood of a natural pandemic that would **cause** the **extinction** of the human race is probably even less today than in the past (except in prehistoric times, when people lived in small, scattered bands, which would have limited the spread of disease), despite wider human contacts that make it more difficult to localize an infectious disease.

### Solvency

#### No global nuclear renaissance – current trend.

Mez, Department of Political and Social Sciences, Freie Universitat Berlin, ‘12

[Lutz, “5-7-12, “Nuclear Energy—Any Solution for Sustainability and Climate Protection?”, http://www.sciencedirect.com/science/article/pii/S0301421512003527]

Is the entire world really building nuclear power plants? By no means. According to the IAEA, 63 blocks with a rating of 61,032 MW are currently under construction (see Table 1). The building projects are spread out among fourteen countries: China (26), Russia (10), India (6), South Korea (5), the Ukraine (2), Japan (2), Slovakia (2), Bulgaria (2) and Taiwan (2) and one block each in Argentina, Brazil, Finland, France, and the USA. The World Nuclear Association (WNA) only lists 61 reactors under construction, but another 156 reactors in the category ‘planned.’ Actual development of nuclear technology teaches us, however, that planned reactors by no means automatically move into the category of ‘under construction.’ In 1979, before the Three Mile Island accident in Harrisburg, there were 233 reactors under construction in the world, and over 100 cancellations followed (Schneider, Froggatt, Thomas, 2011). In view of these facts, the metaphor ‘renaissance of nuclear power’ must be viewed as an ideological weapon. Examined more closely, it would appear that nuclear power has even taken a nose-dive in the Western industrialized countries. In the European Union there were 177 reactors in 1989, whereas the IAEA only lists 134 operational reactors in February 2012. Of the 192 members of the United Nations, only 31 countries had nuclear power plants in operation at the beginning of 2012. Three countries (Italy, Kazakhstan and Lithuania) have in the meantime closed down their nuclear power plants, while in Austria a reactor was built in Zwentendorf but never connected to the grid. A similar reactor project is the completed but never fueled Bataan Nuclear Power Plant in the Philippines. The six biggest countries operating nuclear power plants (USA, France, Japan, Russia, Germany and South Korea) include several countries possessing nuclear weapons (USA, France and Russia) and produce three-fourths of total nuclear power. In 2009 nuclear power plants only produced 13.4 percent of electrical power worldwide. This corresponds to 5.8 percent of Total Primary Energy Supply and a little more than two percent of global final energy consumption. In comparison to nuclear power, the potential contribution of renewable energies to easing the strain on the environment and tackling climate change is much higher because they account for 19.5 percent of global power production and more than 12 percent of primary energy production (IEA, 2011). The United States has the most nuclear capacity and generation among the 31 countries in the world that have commercial nuclear power plants. There are currently 104 operational nuclear reactors at 65 nuclear sites in 31 states. Most of the commercial reactors are located east of the Mississippi River, near water sources. Illinois has 11 reactors and the most nuclear capacity. Since 1990, the nuclear power share of the total electricity generation has averaged about 20%. Nuclear generation of electricity has roughly tracked the growth in total electricity output. Between 1985 and 1996, 34 reactors were connected to the grid. In addition, nuclear generation has increased as a result of higher utilization of existing capacity and from technical modifications to increase nuclear plant capacity. In 2007 the American construction site Watts Bar-2 overtook first place for years as far as delays in construction were concerned, replacing the Bushehr nuclear power plant in Iran, for which cement was first poured on 1 May 1975. The construction of Watts Bar-2 began 40 years ago on 1 December 1972, with the project then being frozen in 1985. The company which owns the plant, the Tennessee Valley Authority (TVA), announced in October 2007 that it would complete the reactor at a cost of US-$ 2.5 billion. Connection to the electricity grid is scheduled for August 2012. In August 2009, the U.S. Nuclear Regulatory Commission (NRC) issued an Early Site Permit for two new reactors at Southern Nuclear's Vogtle site. The two new units are the reference plant for the Westinghouse AP1000 pressurized water reactor design. In February 2010, President Obama announced that the DOE had offered a loan guarantee up to 80% of the project estimated cost of $14.5 billion. Southern Nuclear will only have to pay a credit subsidy fee for the $11.6 billion loan. On February 9, 2012, the Nuclear Regulatory Commission (NRC) voted 4 to 1 to issue the Combined Operating License for Vogtle units 3 and 4. This is the first license to be approved in the United States in over 30 years. In the European Union thirteen out of the twenty-seven member states do not produce any nuclear power themselves or have abolished this technology for technical or economic reasons following political decisions. Fourteen EU member states are currently using nuclear energy, while three countries have shut down their nuclear power plants. Two countries decided after Fukushima to phase-out nuclear power and the remaining countries do not have a nuclear energy program. Eight high-risk reactors were closed down in the new accession countries in the expansion of the EU to Eastern Europe, with the EU and other Western donor countries contributing more than one billion Euros to meet the costs of closure. Four reactors are labeled “under construction” in all of Eastern Europe at present, although a series of new nuclear power plants are being planned. In spite of liberalization and partial privatization of the electrical power sector, the completion or construction of new nuclear power plants constitutes a virtually insurmountable financing problem. Looking at the historical development, there were still a total of 134 nuclear power blocks in operation in Europe in February 2012–116 of them in Western Europe and, following the closure of Ignalina nuclear power plant in Lithuania, a total of 18 in Central and Eastern European countries. According to the IAEA, there are two reactor blocks under construction in Western Europe: one in Finland and since December 2007 one in France. Construction of the first so-called European Pressurized Reactor (EPR) with a rating of 1,600 MW began in Olkiluoto, Finland on 12 August 2005. Since then the project has been overshadowed by exploding costs and delays: originally slated for 2009, commercial operation will probably not take place before August 2013 and instead of the originally planned € 3.2 billion, the reactor will cost almost € 6 billion. An EPR is also being built in France. Construction officially commenced on 3 December 2007 and it was expected that it would take 54 months to complete the plant, i.e. by May 2012. According to inspection reports from the supervisory authority ASN, a host of problems have also cropped up here. As a result, the ambitious time schedule cannot be met and connection to the grid is now scheduled for the end of 2016. The three biggest emerging market countries—India, China and Brazil—embarked on their nuclear energy programmes decades ago, but have only partially achieved their goals. Nuclear energy only accounts for a small percentage of electrical power production and the energy supply in these countries. The People's Republic of China has the most ambitious plans for expanding nuclear power, operating sixteen nuclear power plants at present generating 71 TWh, which accounted for 1.8 percent of power production in 2010. As of February 2012, 26 additional nuclear power reactors are under construction. China had an estimated total installed electricity generating capacity of over 1,000 GW at the end of 2011 and will expand to 1,600 GW by 2020. According to China's National Development and Reform Commission the installed nuclear capacity shall be 80 GW (6%) by 2020 and a further increase to 200 GW (16%) by 2030. But following the Fukushima accident, the State Council announced that it would suspend approval for new nuclear power stations and halted work on four approved units. “The announcement marked a significant policy change” (Green-Weiskel, 2011). Nuclear has remained a small fraction of China's total energy mix, because government has given priority to solar and wind for future energy growth. While China has invested the equivalent of about $10 billion per year into nuclear power in recent years, in 2010 it spent twice as much on wind energy alone and some $54.5 billion on all renewables combined. There are several reasons for China to shelve its nuclear industry. China's energy sector is competing with agriculture for water, and the country is not immune to a temblor-triggered disaster. In India 20 smaller reactors are in operation, meeting 2.9 percent of electricity needs, with six more under construction. In Brazil two reactors are in operation, producing 3.2 percent of electrical power, with one additional reactor block under construction. A closer look shows, however, that twelve out of the 63 reactors under construction (see Table 1) were already included in the statistics with the status of “under construction” more than 20 years ago. Construction of the reactor blocks Khmelnitski 3 and 4, for instance, began in the Ukraine as far back as 1986 and 1987. These blocks are listed under the category of “planned” in the WNA statistics, however. Three out of the ten Russian nuclear power plant construction projects also began in 1985 and 1986—recently completed after 25 years under construction was Kalinin 4 in November 2011. The Atucha-2 nuclear power plant in Argentina has been under construction since 1981 and still no date has been set for its commissioning. Construction of both of the blocks in Belene, Bulgaria, began in 1987 and no dates are scheduled when they will be connected to the grid. And construction at Mochovce 3 and 4 in the Slovak Republic started in 1987, with commercial operation scheduled for 2013. This shows that the statistics contain a whole host of unfinished plants. In view of all these facts, it is erroneous to speak of any “global renaissance,” all the more so because such long building periods lead to exorbitant cost overruns which scarcely any bank would finance—unless the financial risk is assumed by a government. The complexity of the licensing procedure as well as the risks involved in a building project of this type should at any rate not be underestimated (Mez et al., 2009).

#### SMRs empirically fail at commercialization

Magwood, commissioner – NRC, ’11

[William, “ECONOMICS AND SAFETY OF MODULAR REACTORS; COMMITTEE: SENATE APPROPRIATIONS; SUBCOMMITTEE: ENERGY AND WATER DEVELOPMENT,” 7-14-11, CQ Congressional Testimony]

That is not to say that SMRs are a new idea. The conceptual benefits of small reactors have been the subject of discussion and analysis for decades, and all the potential benefits I've mentioned have been considered in the past. The potential advantages of smaller reactors prompted the government to provide considerable financial support for the development of the mid- size, passive-safety reactors in the 1990s and to encourage the pursuit of the pebble-bed modular reactor in the early years of this century. Both efforts proved unable to overcome the economic realities of building and operating nuclear power plants realities that tend to penalize small reactors and reward larger designs. Thus, instead of the AP-600 and 500 megawatt Simplified Boiling Water Reactor of the early 1990s, the market pushed vendors to increase the size of their designs; today, vendors offer Generation III+ technologies based on those smaller systems the 1100 megawatt AP- 1000 and the 1600 megawatt Economic Simplified Boiling Water Reactor.2 Around the turn of the century, both DOE and industry became interested in the Pebble Bed Modular Reactor, or PBMR. This was a small, high-temperature gas-cooled reactor with a generating capacity of about 165 megawatts. This technology captured considerable media attention after U.S. companies became involved in an effort to build a commercial pilot in South Africa. However, as the high costs of the project became apparent, commercial participants began to peel away and eventually the South African project was abandoned. All small reactor technologies of the past failed to find a way to overcome the fact that the infrastructure required to safely operate a nuclear power reactor of any size is considerable. Tons of steel and concrete are needed to construct containment buildings. Control rod drives, steam generators, and other key systems are hugely expensive to design and build. A larger plant with greater electric generating capacity simply has an inherently superior opportunity to recover these large up-front costs over a reasonable period. So why is today different from yesterday? The greatest difference is the fact that the technology has evolved significantly over the years. Having learned lessons from the development of Generation III+ technologies and from the failure of previous small reactors, today's SMR vendors clearly believe they have solved the riddle of small reactor economics. They are presenting novel design approaches that could lead to significant improvements in nuclear safety. For example, design concepts that I have seen thus far further advance the use of passive safety systems, applying gravity, natural circulation, and very large inventories of cooling water to reduce reliance on human intervention during an emergency. SMR designs also apply novel technologies such as integral pressure vessels that contain all major system components and use fewer and smaller pipes and pumps, thereby reducing the potential for a serious loss-of- coolant accident. Very importantly, these new SMRs are much smaller than the systems designed in the 1990s; this choice was made to assure that they could be factory-built and shipped largely intact by rail for deployment. The ability to "manufacture" a reactor rather than "constructing" it on-site could prove to be a major advantage in terms of cost, schedule reliability, and even quality control. But will innovations like these allow this new breed of SMRs to be successful? Maybe. Many years of work remain for SMR vendors to refine their designs and allow for the development of realistic and reliable cost estimates. This is much the same state of affairs that existed in the 2002 time frame when DOE launched the Nuclear Power 2010 program to spur the development and certification of Generation III+ designs such as the AP-1000. At that time, the level of design completeness was insufficient to enable vendors to provide utilities with reliable cost and schedule estimates.

## 2NC

### CP

#### CP solves globally

Their author Lovering et al 12

[Michael, – et al and Ted Nordhaus—co-founders of American Environics and the Breakthrough Institute a think tank that works on energy and climate change – AND – Jesse Jenkins-Director of Energy and Climate Policy, the Breakthrough Institute, Why We Need Radical Innovation to Make New Nuclear Energy Cheap, 9/11, thebreakthrough.org/index.php/programs/energy-and-climate/new-nukes/]

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

#### Funding isn’t key – CP levels the playing field among SMR manufacturers.

Koplow and Vancko, ‘11

[Doug (United Nations Environment Programme's Working Group on Economic Instruments, MBA – Harvard) and Ellen (project manager – nuclear/climate @ UCS), “Nuclear Power: Still Not Viable without Subsidies,” Union of Concerned Scientists, February]

Reduce, not expand, subsidies to the nuclear power industry. Public subsidies to this indus­try are lucrative and highly concentrated fund­ing for a narrow set of technologies and firms. They should not be expanded to cover more generating capacity than current government policies allow, nor should new categories of subsidies be created. Doing so would make the U.S. taxpayer responsible for considerable additional costs and economic risks—risks that should be borne by the industry. In particular, new loan guarantees above and beyond those already authorized by Congress in EPACT 2005 would expand government involvement in an arena where it is poorly equipped to engage. Federal involvement in markets should instead focus on encouraging firms involved in nuclear power—some of the largest corpora­tions in the world—to create new models for internal risk pooling and to develop advanced power contracts that enable high-risk projects to move forward without additional taxpayer risk. The following recommendations discuss where existing subsidies to the industry should be reduced or eliminated. • Award subsidies to low-carbon energy sources on the basis of a competitive bidding process across all competing technologies. Subsidies should be awarded to those approaches able to achieve emissions reductions at the lowest pos­sible cost per unit of abatement—not on the basis of congressional earmarks for specific types of energy. Most federal programs that benefit nuclear power are technology-specific subsidies to miti­gate such problems as the high cost of capital or nuclear waste management. While such pro­grams offer targeted ways for Congress to pro­vide subsidies to constituents, they are not well structured to achieve a successful energy market transformation to a low-carbon future. To the extent that taxpayer subsidies are extended, they should be awarded on the basis of a technology-neutral competitive auction, with successful bid­ders chosen on the basis of their bids to accept the lowest subsidy per kilowatt-hour delivered.

#### Our solvency is reverse causal – a strong SMR nuclear renaissance will follow reduction of NRC regulations

Wheeler, Power Engineering Editor, ’11

[Brian Wheeler, Associate Editor, Power Engineering, “Small Modular Reactors are ‘Hot’,” February 1st 2011, http://www.power-eng.com/articles/print/volume-115/issue-2/departments/nuclear-reactions/small-modular-reactors-are-hot.html]

One of the “hottest” topics being discussed in the U.S. nuclear industry is the viability of deploying small modular reactors (SMR), those under 300 MW, into the nuclear fleet to help address environmental concerns while keeping up with the demand for power. The U.S. electricity demand is projected to increase by 28 percent by 2035. And annual CO2 emissions are projected to increase by 275 million metric tons, according to the Department of Energy. The DOE has a goal to decrease 28 percent of greenhouse gas emissions by 2020 and it expects that the goal can be met with the help of small modular reactors. The concept is to install the small modular reactors to areas and applications underserved by large plants, or sites that may not be able to support a large unit. “But it is not a competition between large and small reactors,” said Paul Genoa, director of policy development at trade group the Nuclear Energy Institute. But the idea of the SMR is not new in the U.S. The U.S. Navy has been using small reactors on vessels for over 50 years. Using this design in the energy industry, though, is new. Currently, the U.S. does not currently have any SMRs producing commercial power, but vendors such as Babcock and Wilcox are moving forward towards design certification. Although, the NRC expects the first deployment of an SMR in the U.S. may not come until the 2018 to 2020 timeframe. The distant timeframe is for numerous reasons. The plan is to build a SMR, start generating power and bring more online to form a larger nuclear plant, as needed. The SMRs are expected to be ready, as the DOE calls it, to “plug and play” when the reactor arrives on-site. Sounds simple? There are still obstacles that need to be defeated before the arrival of a commercial SMR. Licensing is the number one challenge at this point. The Nuclear Regulatory Commission established the Advanced Reactor Program in 2009 to focus on new licensing technologies. NRC is studying several pre-application reviews to identify possible technical issues, such as safety, security and emergency planning. The light water small reactors may be very similar to large designs, but they still must go through a separate licensing process. Vendors that engage the NRC early can resolve these technical issues. To address safety and security concerns, the small reactors will be built with post-9/11 safety concepts into the designs. NRC expects the first application submission by 2012. The funds for the research and development of the SMR could pose a problem as well. But the Obama administration has requested $38.9 million for the 2011 fiscal year budget for the development of SMRs. The DOE supports public and private partnerships to advance mature SMR designs and supports “research and development activities to advance the understanding and demonstration of innovative reactor technologies and concepts.” Among other goals, in FY2011 the DOE plans to “solicit, select and award project(s) with industry partners for cost-sharing the U.S. NRC review of design certification document for up to two of the most promising light water SMR concept(s) for near-term licensing and deployment” and “develop recommendations, in collaboration with NRC and industry, for changes in NRC policy, regulations or guidance to license and enable SMRs for deployment in the U.S.” And as the general public’s interest in energy continues to grow, so does the interest in SMRs, said Philip Moor, vice president of consulting and management firm High Bridge Associates. If approved, the funding towards the development of small reactors in the U.S. may play a part of the International Atomic Energy Agency’s estimate of between 49 to 97 SMRs built by 2030. Utilities may have more interest in SMRs once the NRC gains more expertise and the uncertainty of deploying these reactors in the U.S. can be addressed. And if the regulator approves any of the designs for licensing, the U.S. may see a stronger nuclear renaissance take place. As we have seen, some operators have scaled back or completely pulled out on plans to build new large reactors due to the cost. The ability to construct these reactors in factories could lead to lower costs and shorter construction times. Of course, the upfront capital to develop and engineer the facility is going to be needed. But after that, the reactors can be built in the controlled environment in repetition to lower cost, which could in return lead to more clean energy on the grid.

#### Our evidence is comparative – regulations are the MAIN BARRIER to the deployment of SMRs.

Hopf, Senior Nuclear Engineer, ’11

[Jim Hopf, Senior Nuclear Engineer, Member of the American Nuclear Society’s Public Information Committee, “[Roadblock in Congress for SMR Development,”](file:///C%3A/Users/Abhik/AppData/Roaming/Microsoft/Word/Roadblock%20in%20Congress%20for%20SMR%20Development%2C) October 25th 2011, http://ansnuclearcafe.org/2011/10/25/congress-smr/]

As many have observed, the main barrier to the deployment of SMRs may not be a lack of government financial or R&D support, but instead the enormous amount of time and money required to get new reactor designs licensed by the NRC. Reactor licensing processes have been taking many years and costing more than a $100 million dollars. Even approving an exact copy of an already-licensed reactor design (for a new site) is projected to take more than two years. Even SMRs that deploy conventional light-water technology (such as NuScale or mPower) can expect a long (~ 5 year) licensing process (starting in late 2012 or 2013). For non-conventional technologies like Hyperion, who knows how long it will take? The NRC has stated that non-conventional SMRs like Hyperion are not on its priority list right now, and that it will only consider such an application when a serious customer has been found (thus setting up a chicken-egg problem). Other issues that may hold back SMRs include security and emergency planning/evacuation requirements, and per-reactor NRC fees. If the NRC is not willing to consider the SMRs’ lower potential radioactivity release, as well as the lower probability of such release, in setting these requirements, as well as scaling fees with reactor capacity, it may destroy SMRs’ economic viability. Perhaps a more effective way for the government to support SMRs is for it to do something to reduce the licensing-related barriers discussed above, as opposed to outright financial support of SMR development. Possible options include making sure the NRC has sufficient resources to handle the entire volume of incoming license applications, somehow limiting the scope of review, or requiring the NRC to complete reviews within some fixed, reasonable time period.

#### SMRs are competitive in the SQUO – regulatory challenges remain the only barrier to overcome.

Lordan ’12 (Rebecca Lordan, Energy Policy Institute at Chicago, “Bite-Size Nuclear Reactors: More Than We Can Chew?”, <http://chicagopolicyreview.org/2012/04/16/bite-size-nuclear-reactors-more-than-we-can-chew/>, April 16, 2012)

In their recent white paper “Small Modular Reactors—Key to Future Nuclear Power in the US,” Robert Rosner of the Energy Policy Institute at Chicago and Steven Goldberg of Argonne National Laboratory argue that America’s history with Small Modular Light Water Nuclear Reactors (SMRs), the growing demand for carbon-free energy sources, and a potential cost advantage make SMRs ready for prime time: the U.S. nuclear energy market. While each module generates only 300 megawatts or less of power – a typical nuclear reactor generates approximately one gigawatt (1000 megawatts) – deploying a system of SMRs could have a dramatic effect on the domestic energy portfolio. Light water SMRs are governed by the same physical principles as the aging fleet of traditional reactors. Atomic reactions generate heat that boils water into steam, which in turn drives electricity-generating steam turbines. However, the smaller size of SMRs allows these power plants to be placed underground, situated in more diverse geographical locations, and, potentially, manufactured in a standard, cost-effective way. There are two major design advantages of a smaller size. First, SMRs are less susceptible to potential attack. When they are placed underground, SMRs have an additional layer of protection that intruders must penetrate before gaining access to the site. Underground modules are also more difficult to target from the air. Second, because SMRs are submerged underwater, they are better protected from natural disasters — especially earthquakes — because the water can absorb seismic forces and shaking. The authors argue that SMRs would not suffer the catastrophic safety failures that occurred at the Fukushima Dai-ichi Plant in March of 2011. But can these SMRs compete economically with alternative green technologies and with low natural gas prices? Rosner and Goldberg assert that they can, but only under particular economic and regulatory conditions. SMR plants have two major cost advantages over alternative energies: they can be built one module at a time, thereby reducing up-front capital costs, and they can take advantage of existing nuclear infrastructure such as component and equipment facilities. Large-scale reactors are constructed on-site from scratch. As a result, each site requires expensive capital investments and is staffed by a novice local workforce that must learn by doing; costly delays are common due to small errors. In contrast, production of SMRs in a manufacturing facility would benefit from an experienced workforce and machine-controlled precision and could create economies of scale. Under these conditions, SMRs would not only be competitive with carbon-based energy, but would have lower unit-energy prices than other alternative energy options, such as wind, solar photovoltaic, solar thermal, and geothermal, which are less efficient and less reliable and suffer from high capital costs. However, alternative energies do not face the same regulatory challenges as nuclear power. In order to further decrease the costs of SMRs to a competitive level, the Nuclear Regulatory Commission (NRC) would have to rule in favor of changing license requirements. One such change would be a reduction in the number of onsite staff required at nuclear facilities, which would decrease operating and infrastructure costs. Rosner and Goldberg also outline a variety of ways that the government should support the nascent SMR industry, including cost incentives and market transition strategies to help limit the uncertainty and risk that often deter private investors. The authors map out a five-step business plan beginning with a first-of-a-kind pilot plant and ending with fully developed facilities that have achieved economies of scale. But there is much to do before their plan is realized. While the paper mainly examines SMRs based on economic and manufacturing factors, the regulatory challenges that small reactors face are significant. Despite the country’s history with SMRs, this difficult regulatory environment and anti-nuclear sentiment after the events at Fukushima Dai’ichi will make deploying small modular reactors on the scale the authors imagine a challenge.

#### The U.S. is still the global tech leader - institutions

Acemoglu 12 (Christian Science Monitor, World's next technology leader will be US, not China – if America can shape up, By Daron Acemoglu and James A. Robinson / April 19, 2012 <http://www.csmonitor.com/Commentary/Global-Viewpoint/2012/0419/World-s-next-technology-leader-will-be-US-not-China-if-America-can-shape-up>) JD

But what matters for global leadership is innovation, which is not only the key driver of per capita income growth but also ultimately the main determinant of military and diplomatic leadership. It was the US that proved after [Pearl Harbor](http://www.csmonitor.com/tags/topic/Pearl%2BHarbor) how a prosperous economy can rapidly increase its military power and preparedness when push comes to shove. So the right question to ask is not who will be the military leader of the next century, but who will be the technological leader. The answer must be: most probably the US – but only if it can clean up its act. The odds favor the US not only because it is technologically more advanced and innovative than China at the moment, with an income per capita more than six times that of China. They do so also because innovation ultimately depends on a country’s institutions.

#### CP solves it – allows for spillover of tech throughout industries and via our national labs. That’s 1NC ev.

#### SQUO solves for the add-on – subsidies exist now.

Energy Collective ’13 (Update on Small Modular Reactor Development, http://theenergycollective.com/ansorg/201641/update-and-perspective-small-modular-reactor-development?utm\_source=feedburner&utm\_medium=feed&utm\_campaign=The+Energy+Collective+(all+posts)

The US Department of Energy has a $452 million program to share development and licensing costs for selected small modular reactor (SMR) designs. The DOE’s goal is to have an operating SMR by ~2022. Last November, the DOE awarded the first grant to the B&W mPowerTM reactor. In more recent news, the DOE has decided to issue a follow-on solicitation to enter a similar cost-sharing agreement with one or more other SMR vendors (and their SMR designs). The status of development and licensing for several SMR designs are summarized below.

#### No internal link between nuclear power/science national labs and their ability to solve avian flu. Their evidence is absolutely laughable.

#### No impact to bird flu – even if it mutates.

Marc Siegel, associate professor at the New York University School of Medicine, March 26, 2006, The Washington Post, p. B7.

Even if the H5N1 virus does mutate enough to spread easily among the upper breathing tracts of humans, there are multiple scenarios in which it would not cause the next massive pandemic. In fact, the Spanish flu of 1918 made the jump to humans before killing a large number of birds. Not only do we have vaccinations, antibiotics, antiviral drugs, public information networks, steroids and heart treatments that were lacking in 1918 to treat victims of the flu; in addition, the growing worldwide immunity to H5N1 may lessen the outbreak in humans even if the dreaded mutation does occur.

#### Government guarantees create moral hazards- creates risky market structures- causes instability and turns case

Gerdin ’11 (Erik Gerding, Associate Professor at University of Colorado Law School. His research interests include securities, banking law, financial regulation generally, and corporate governance, “The Inherent, Ineluctable Instability of Financial Institution Regulation”, <http://www.theconglomerate.org/2011/09/the-inherent-ineluctable-instability-of-financial-institution-regulation.html>, September 12, 2011)

Here is my second contribution to the Faculty Lounge Online Forum on the legislative and regulatory process of financial reform. Check out the posts by the other contributors including, Kim Krawiec (Duke), Christie Ford (Univ. British Columbia), Brett McDonnell (Minnesota), Saule Omarova (North Carolina), and Dan Schwarz (Minnesota). In my last post, I concluded that the presence of government subsidies – particularly guarantees explicit (deposit insurance) and implicit (Too-Big-To-Fail) – makes the political economy of financial institution regulation different from other areas of the regulatory state. In this post, I argue that these government subsidies and moreover, the underlying reason for government subsidies, contributes to the inherent instability of financial institution regulation. The presence of government guarantees – explicit or implicit – creates strong incentives for financial firms to externalize the cost of their risk taking onto taxpayers. But there is more to government guarantees than moral hazard. Consider the following: Market distortion: When the government subsidizes some financial firms but not others, it distorts the market. A lower cost of capital allows the subsidized firms to undercut their competition. This can drive competitors either out of business or, if risk is being mispriced because of an asset boom, into riskier market segments (a phenomena I explored in a symposium piece). Cheaper debt and leverage: Government guarantees also. make debt cheaper than equity This supercharges the incentives of financial firms to increase leverage. Higher leverage of financial institutions, in turn, works to increase the effective supply of money. More money can fuel asset price bubbles and mask the mispricing of risk (phenomena explored by Margaret Blair in this paper, as well as by me in a forthcoming symposium piece in the Berkeley Business Law Journal.) Cheaper debt and regulatory capital arbitrage: Cheaper debt also supercharges financial firm incentives to game regulatory capital requirements (something I am writing about in the context of the shadow banking system. See also Jones; Acharya & Schnabl; Acharya & Richardson. Bailouts and correlated risk: Governments face pressure to bail out firms when their risk taking is highly correlated (because multiple firms will fail at the same time). On the flip side, this creates a strong incentive for financial firms to take on correlated risk. (See, e.g., Acharya et al.). Correlated risk taking reinforces the kind of herding that behavioral finance scholars have analyzed in the context of asset price bubbles. So feedback loops abound. What to do, then, about government subsidies? “Stop us before we bail out again” One approach is to erect barriers to the government providing subsidies and bailouts. Dodd-Frank is chock full o’ provisions that aim to do just this. But legal scholars need to give policymakers a dose of reality about the ability of law to hardwire “no bailouts, no subsidies.” I just came back from a conference last week in which a number of economists kept saying that this hardwiring was exactly what law needed to contribute to financial reform. Here is how some of the law professors in the room (including your friend and mine Anna Gelpern) responded: 1. Legal rules are by nature incomplete and, under pressure, firms and regulators will seek ways around rules. 2. It ain’t so easy for a sovereign to bind itself. In the end, what is the remedy and who will enforce it? 3. There is nothing to stop Congress from amending the law. Legislatures can’t entrench laws against amendments by future legislatures (although the government must honor contractual obligations – for a discussion of these issues, see U.S. v. Winstar) True, Dodd-Frank’s prohibitions on bailouts and governments are not just pieces of paper. Law does constrain government behavior to a degree and can promote political accountability. However, we should not expect “law” to work like a wind-up toy that is self-executing without worrying about issues of interpretation, compliance, incentives, and the norms of government actors. I restrained myself at the conference from delivering a little legal koan: “the law will bind government officials, if they believe it binds them.” As an aside: it strikes me that the legal academy has to do a much better job of educating economists, policy makers and the public about what is “law” and how it operates. We have to do this in an accessible manner and without undermining important norms of legal compliance. Financial reform proposals are replete with calls for more “automatic regulations” – whether to counter capture or political pressure to spike the economic punch when the party gets startin’. (For example, economists have proposed the very sensible policy of counter-cyclical capital buffers) But fetishizing automatic regulations can pervert financial regulation. Over-reliance on automatic regulation: Ignores the fact that regulators and lawmakers must interpret laws; and Discounts the likelihood or regulatory arbitrage or regulatory evasion. In short, we need to have a much richer discussion of what the “law in action” means. Letting it Burn: Confusing Bailouts with Other Externalities of Financial Institution Risk-Taking What if restrictions on bailouts and government guarantees work too well? There is a rationale for government interventions like deposit insurance, lender-of-last resort, and bailouts. They are not just about “capture.” Financial institution failure can impose significant negative externalities (which is a fairly antiseptic description of the social costs of financial crises). Counterparty and market discipline don’t force firms to internalize all of these externalities. I respect the intellectual consistency and fervor of those who believe that bailouts and government interventions are the root of all financial regulatory problems. But I wouldn’t trust them in any position of responsibility. Deposit insurance and bailouts aren’t the only ways governments distort markets when they act to avoid crises. Lender-of-last resort actions and even interest rates changes can create a type of moral hazard (see “Put, Greenspan”). It is a lot harder for central banks to calibrate liquidity responses to market seizures than armchair critics think. Countering Subsidies So if some government subsidization of the financial firms is inevitable, it is critical that the government counter these subsidies -- whether by limiting firm risk-taking or charging firms for the subsidy. Absent attempts to counter subsidies, we are right back where this post started – moral hazard, distortion, cheap debt --> leverage and capital arbitrage.

#### Government financial intervention causes corruption- generates dependency – instability- shifts private investment towards flawed programs- turns case

Loris and Spencer ’11 (Nicolas Loris and Jack Spencer, Nicolas D. Loris is a Policy Analyst and Jack Spencer is Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation, “Obama's Department of Energy Should Not Be the Green Banker”, <http://www.thecuttingedgenews.com/index.php?article=52893pageid=16pagename=Opinion>, October 11th 2011)

On July 14, 2011, the Senate Energy and Natural Resources Committee marked up the Clean Energy Financing Act of 2011 (S. 1510). The bill would establish a federally owned, nonprofit Clean Energy Deployment Administration (CEDA) in the Department of Energy (DOE) to support the deployment of politically defined clean technologies. CEDA, also known as a “green bank,” is an outgrowth of the loan guarantee programs of the Energy Policy Act of 2005 and the 2009 stimulus package. It would provide government-backed low-interest loans, credit enhancements, loan guarantees, and other financial mechanisms for certain energy and automotive projects that Washington deems worthy. President Barack Obama included a similar proposal for green projects in the infrastructure bank section of his American Jobs Act. However, while proponents call this “innovative financing,” in reality it is a substantial and costly subsidy that invites unjustified government intervention into the private energy marketplace. The Department of Energy has no business playing banker. CEDA would redirect capital inefficiently and create a massive taxpayer liability. CEDA: A Permanent Loan Guarantee Expansion When the federal government provides a loan guarantee, it enters into a contract with private creditors to assume the debt if the borrower defaults. According to the DOE, the purpose is to “allow the Federal Government to share some of the financial risks of projects that employ new technologies that are not yet supported in the commercial marketplace or where private tinvestment has been inhibited.” If a company defaults on a federally backed loan guarantee, the taxpayer is on the hook. This is not an appropriate role for the federal government. Two existing federal loan guarantee programs are of dubious value and have questionable objectives. Under Section 1703 of the Energy Policy Act of 2005, DOE has provided billions of dollars in loan guarantees for technologies that “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases.” Section 1705 of the American Reinvestment and Recovery Act, more commonly known as the stimulus bill, added $8 billion to support additional loan guarantees, including funding for the scandalous Solyndra project. CEDA would permanently extend these misguided policies by granting DOE unlimited authority to authorize loans without limiting the number of loans it can issue. The initial capitalization or expenditure would be $10 billion, and the Congressional Budget Office (CBO) projects CEDA to cost an additional $1.1 billion over the next five years. Picking Losers Although the status of many loan guarantees is either conditional or recently closed, the first loans granted by DOE illustrate some of the problems with the program. The solar company Solyndra received one of the first stimulus loan guarantees—a $535 million loan. During a visit to the plant in 2010, President Obama said, “Companies like Solyndra are leading the way toward a brighter and more prosperous future.” In 2010, Solyndra closed one of its facilities and canceled its initial public offering. In August 2011Solyndra filed for Chapter 11 bankruptcy and laid off its 1,100 workers. The company is now under criminal and congressional investigations into how it secured the loan guarantee, and Solyndra owes the taxpayers $527 million. Solyndra is not the only “green” company having financial troubles. First Wind Holdings, another loan guarantee recipient, withdrew its initial public offering. In these instances, the reason for providing financing was unclear because they were not economically viable endeavors. When the government makes decisions best left to the market, it increases the opportunity for and likelihood of crony capitalism, corruption, and waste. Loan guarantees artificially make even dubious projects appear more attractive and lower the risk of private investment. For instance, private investors sunk $1.1 billion into Solyndra. Much of the private financing came after the Department of Energy announced Solyndra was one of 16 companies eligible for a loan guarantee in 2007. Private investors look at loan guarantees as a way to substantially reduce their risk. Even if a project seems to be a loser but has a huge upside (especially if complemented with other policies like a federal clean energy standard), private companies can invest a smaller amount if the government will back the loan. If the project fails, they still lose money, but the risk was worth it. Without the loan guarantee, these projects would probably not have been pursued, and that is why they fail. Subsidizing Winners In other cases, private financing was available so there was no need for preferential financing. For instance, Nordic Windpower received private funding in 2007, two years before the company received its loan guarantee. Google invested $100 million in Shepherds Flat Wind Farm. Although that investment was made after the loan guarantee, Google determined it to be a worthwhile investment. If that is the case, then the project should not need a loan guarantee. Even if a project with a federally backed loan is successful, attributing the project’s success to the loan guarantee is a huge assumption. Venture capitalists and other investors, who have much more expertise and knowledge than government bureaucrats in making investment decisions, are in a better position to determine which ideas and businesses have the most potential. Without the loan guarantee, projects with the least promise would either not attract investment or simply fail, freeing capital for risky, but more promising ventures. In contrast, a government loan guarantee program ensures that the public pays for the failures while the private sector reaps the benefits of any successes. Loan Guarantees Distort the Market Proponents of loan guarantees who argue that these programs come at minimal cost and are not subsidies ignore the fact that CEDA loans cause the same harm as direct government subsidies by distorting normal market forces and encouraging dependence on the government. By subsidizing a portion of the actual cost of a project through a loan guarantee, the government is allocating resources away from more-valued uses to less-valued uses. In essence, these guarantees and loans direct labor and capital away from more competitive projects. A loan guarantee program signals to the energy producer that the project does not need to be competitive. Rather, the green bank simply has to like it. This reduces the incentive for the energy investor or business to manage risk, innovate, and increase efficiency, and it crowds out other innovative energy projects that do not receive loan guarantees. While a loan guarantee or a below-market loan may be good for the near-term interests of the individual recipient, it is not good for taxpayers or long-term competitiveness. Loan guarantees also encourage more government dependence. If the government moves to more actively subsidizing clean energy technology through CEDA, investors will wait to determine who the government winners will be before they spend more of their own money on innovative ideas, expanding their businesses, or hiring more employees. As Darryl Siry, former head of marketing at Tesla Motors (a loan guarantee recipient), said, “The existence of an 800-pound gorilla putting massive capital behind select start-ups is sucking the air away from the rest of the venture-capital ecosystem…. Being anointed by DOE has become everything for companies looking to move ahead.”

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#### The International Energy Agency makes this distinction specifically – PPPs of energy arenot a financial incentive, it’s just straight up government acquisition, which avoids market links and opens the floodgates

International Energy Agency, 2010

[Policies and Measures Databases, http://www.iea.org/textbase/pm/explanation.asp]

Policy Type: The particular kind of policy instrument planned or implemented.

Education and outreach: Policies and measures designed to increase knowledge, awareness, training among relevant stakeholders or users. This can include general information campaigns, targeted training programmes, labelling schemes that provide the user information on a product’s energy usage or emissions.

Financial incentives and subsidies: Policies and measures that encourage or stimulate certain activities, behaviours or investments using financial and fiscal instruments. These include feed-in tariffs for renewable energy, rebates for the purchase of energy-efficient appliances, grants, and preferential loans and financing. They also include tax incentives, such as tax exemptions, reductions or credits on the purchase or installation of certain goods and services.

Policy processes: Refers to the processes undertaken to develop and implement policies. This generally covers strategic planning documents and strategies that guide policy development. It can also include the creation of specific bodies to further policy aims, making strategic modifications to existing policy, or developing specific programmes.

Public investment: Policies and measures guiding investment by public bodies. These include government procurement programmes (e.g. requirement to purchase energy efficient equipment and vehicles, or to source a certain percentage of energy use from renewable sources) and infrastructure investment (e.g. urban planning and transport infrastructure).

RD&D: Policies and measures for the government to invest directly in or facilitate investment in technology research, development, demonstration and deployment activities.

Regulatory instruments: Covers a wide range of instruments by which a government will oblige actors to undertake specific measures and/or report on specific information. Examples include energy performance standards for appliances, equipment, and buildings; obligations on companies to reduce energy consumption, produce or purchase a certain amount of renewable energy; mandatory energy audits of industrial facilities; requirements to report on greenhouse gas emissions or energy use.

Tradable permits: Refers to three kinds of systems – greenhouse gas (GHG) emissions trading schemes, white certificate systems stemming from energy efficiency or energy savings obligations, and green certificate systems based on obligations to produce or purchase renewable energy-sourced power (generally electricity). In GHG trading schemes, industries must hold permits to cover their GHG emissions; if they emit more than the amount of permits they hold, they must purchase permits to make up the shortfall. If they emit less, they may sell these. White certificate schemes create certificates for a certain quantity of energy saved, for example a MWh; regulated entities must submit enough certificates to show they have met energy saving obligations. Again, if they are short, this must be made-up through measures that reduce energy use, or through purchase of certificates. Green certificates refer to renewable energy certificates which represent the certified generation of one unit of renewable energy, generally one megawatt-hour (MWh). Certificates can be traded and used to meet renewable energy obligations among consumers and/or producers.

Voluntary agreement: Refers to measures that are undertaking voluntarily by government agencies or industry bodies, based on a formalised agreement. There are incentives and benefits to undertaking the action, but generally few legal penalties in case of non-compliance. The scope of the action tends to be agreed upon in concert with the relevant actors. These are often agreed to between a government and an industry body, with the latter agreeing to certain measures; for example, reporting information on energy use to the government, being subject to audits, and undertaking measures to reduce energy use.

#### 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.

#### 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.

#### 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.

#### Webb is Canadian and means his distinctions on incentives don’t apply

MacNevin 93, Alex -Tax Evaluation Division – Federal Department of Finance, 31 Alta. L. Rev. 539

Not surprisingly, Mr. Webb's perspective is primarily legal in focus; he is concerned with what he views as deficiencies in legal structure and channels of legal authority and recourse. As an economist, I am not qualified to discuss the legal issues raised by Mr. Webb. However, his passing reference, in a related paper to be delivered at this conference, refers to the Auditor General's estimates that there are $41 billion and $28 billion in, respectively, direct expenditure incentives and tax expenditure incentives.1 Incentives are thus ultimately about money -- that is, who gets it, why, how, how much, what is the effect and how is this accounted for -- and therefore have important economic as well as legal dimensions. While Mr. Webb's paper deals with both expenditure and tax incentives, my comments concentrate on the latter, with which I am most familiar. II. THE IDENTIFICATION OF TAX INCENTIVES One fundamental problem with respect to accountability in the area of taxation arises because of difficulties in defining what is or is not a tax expenditure or a tax incentive. A central aspect of accountability relates to the seemingly simple basic requirement for documenting the amounts of money foregone through various incentives. Mr. Webb notes that information on the costs of tax incentives are reported only sporadically in tax expenditure accounts, the last of which was put out by the Minister of Finance in 1985. He also points out that tax incentives are removed from the normal budgeting and estimating procedures that apply to many other incentives on the expenditure side (which, incidentally, he views as generally deficient). The infrequent release of tax expenditures (or, as they were called in the 1985 document, selective tax measures) tables may in part reflect the absence of a legal requirement that they be produced on a regular basis.2 They also, however, reflect significant conceptual difficulties encountered in constructing such accounts as well as prevailing concerns about the extent of their usefulness, including their interpretation. Difficulties in this regard were highlighted in a 1988 conference on tax expenditures and accountability in taxation that was jointly sponsored by the Department of Finance and the John Deutsch Institute of Queen's University.3 In the opinion of many of the public finance experts who participated in the conference, tax expenditures often cannot easily be distinguished from structural parameters of the tax system. Identification of tax incentives necessitates comparison of the actual tax system with an ideal "benchmark" tax system. This is entirely different from the case of direct expenditures where no comparable reference base is required. One practical difficulty confronting tax expenditure accounting is that any view about what the tax base should be is essentially a value judgement and hence will vary from individual to individual. The result is that items which may be viewed as tax expenditures under one particular benchmark tax system may not be viewed as such under another benchmark. For example, tax deductions for retirement savings plans are a tax expenditure under an annual income tax benchmark, but are not tax expenditures under lifetime income tax or consumption tax benchmarks. Since the federal tax system contains a mixture of elements of all three of these tax regimes, considerable difficulties in identifying tax expenditures exist. Related additional complexities arise because an actual tax system can only approximate the desirable characteristics of any particular normative view as to what should be taxed. For example, while economists may be able to define fairly precisely what real economic income is over a particular period of time under an income tax base, it is impractical to design an income tax system that has the actual characteristics dictated by theory. The result of is that in some instances, it is not clear how a particular tax measure or group of related tax measures should be viewed under an actual tax system that is inevitably only an imperfect approximation of a chosen "benchmark" tax system.4 Many examples can be given to illustrate the difficulties that arise in this respect. For example, considerable uncertainty arises about how the various provisions relating to the taxation of capital gains should be treated for tax expenditure accounting purposes under an income tax regime that taxes nominal gains on a realization basis rather than real gains on an accrual basis. The integration of the personal and corporate income tax systems gives rise to other examples. Under a view that treats the integrated personal and corporated tax systems as the benchmark, the dividend tax credit is not a tax expenditure. Under one that treats the personal and corporate tax systems as separate benchmark systems, it is. The tax expenditure treatment of cash accounting for farmers and fishermen provides another example. Economists are uncomfortable on tax principle grounds with the deductibility of expenditures on inventory because such expenditures merely reflect the transfer of one asset (cash) into another asset (inventory). Accrual accounting rules, which are required of other types of businesses, effectively result in unsold inventories being added back into income at the end of the year so that no deduction in the year is permitted. Past tax expenditure accounts have identified cash accounting as a tax expenditure, although it is far from obvious that, at least for full-time farmers and fishermen, cash accounting on balance results in lower tax liabilities over time or that from their perspective it is anything more than a peculiar tax wrinkle. It is notable that there is no dollar estimate of the value of cash accounting in previous tax expenditure accounts. III. THE ACCOUNTABILITY OF TAX INCENTIVES One common theme that emerged from the conference on tax expenditures and accountability was that, in light of the many difficulties in identifying tax expenditures, it might be desirable to present tax expenditure information from the perspective of a number of different normative benchmark systems. This would highlight aspects of the tax system from these different perspectives. It would, however, achieve this at the cost of considerable added complexity in interpreting the accounts, particularly to users of the accounts who were not tax experts. There may, therefore, be somewhat of a conflict between the usefulness of tax expenditure accounts in their role as an instrument of tax analysis versus their role as an accountability instrument where clarity and simplicity of presentation and interpretation have high priority. It may be possible to strike a compromise by, for example, ensuring that tax expenditure accounts clearly identify the key tax measures that most reasonably could be substituted for direct expenditure programs. This would facilitate comparisons of tax expenditures data with those for comparable programs on the direct expenditure side in the Public Accounts and thereby permit a more complete assessment of the incentives and subsidies applying to particular sectors, geographical regions, and so on. Such an approach would foster the accountability objective of "functional equivalence" identified by Mr. Webb. Problems with compiling tax expenditures accounts are highlighted when the very structure of the tax system undergoes major changes, such as with the income tax reform of 1988 and with the introduction of the GST to replace the manufacturers sales tax. In such circumstances, presentation of tax expenditure information must be thoroughly reformulated to reflect the revised tax regimes and, indeed, the changing benchmark norms. This can give rise to problems of lack of continuity and comparability of data over time. As an additional practical matter, significant lags in the availability of taxation data may delay the release of tax expenditure tables that reflect the new regimes. There are two and three year lags for, respectively, personal income tax data and corporate income tax data. Delays in the availability of taxation data are particularly problematic since it is typically much more difficult to forecast the ultimate cost of tax incentives than is the case for direct expenditure incentives. The main reason for this is that tax incentives are almost always open-ended while direct expenditure incentives are typically subject to an overall budget constraint. The total cost of a tax incentive thus depends entirely on the usually difficult to predict take-up response of taxpayers, which can give rise to considerable uncertainty in budgeting.5 There are thus significant difficulties with tax expenditure analysis even as an accounting device for providing estimates of the cost of individual tax measures. Judged by the other criteria identified above they are substantially more deficient since they provide no insight whatsoever into the questions of who benefits from tax incentives, why, and what are their effects. Analytical techniques, (such as full evaluations) in addition to accounting techniques, are required in order to provide a complete picture of both the cost and the efficacy of tax measures. I would note, however, that the problems in identifying tax expenditures, particularly in an environment of changing tax structures or norms, make it difficult to systematically evaluate tax expenditures or incentives on a routine cyclical basis as is done for direct expenditure programs. The limitations of tax expenditures information naturally raise questions about the appropriate amount of scarce analytical resources that should be devoted to the preparation of tax expenditure tables, rather than to alternative or complementary tools of accountability such as in-depth studies of the rationale and cost-effectiveness of particular tax measures and related groupings of tax measures; irrespective of whether there is a consensus as to their tax expenditure status under any particular benchmark tax system. The Department of Finance has long wrestled with the practical difficulties and trade-offs involved in compiling tax expenditure data and other accountability information that is, on balance, most revealing with respect to the underlying structure of the tax system. The proceedings of the John Deutsch Conference indicate clearly that there are no easy solutions to the problems. IV. CONCLUSION As noted earlier, Mr. Webb also makes reference to the adequacy of current budgeting procedures for tax incentives. The problem of identifying and measuring tax incentives separately from the "normal" parameters of the tax system hints at the intimate relationship between tax expenditures or (tax incentives) policy and the more limited process of modifying and improving the tax system -- that is the strict design of tax policy. This latter process is a natural component of the government's routine budget procedures and is subject to well-known budget conventions. Procedures relating to the introduction or modification of tax incentives must therefore inevitably be conducted within that somewhat restrictive environment. Can improvements be made which reflect both the need for improved budgeting procedures for tax incentives and the unique environment in which tax measures are designed and modified? I am sure they can but I am considerably less sure that such procedures can be routinized through legislative structure or guidelines. In summary, I fully support the general thrust of Mr. Webb's paper of the need for improved structures and instruments of accountability. In my view, however, the pursuit of that objective must be tempered by recognition of the significant practical obstacles that arise because of the unique characteristics of tax incentives.

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#### Waxman def is based on DOE order 5700.5

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

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

#### That’s no longer statute

DOE 2k [5/8/00 “DOE N 251.35, Cancellation of Directives,” [https://www.directives.**doe**.gov/directives/0251.035-CNotice](https://www.directives.doe.gov/directives/0251.035-CNotice)]

Effective immediately the following directives are canceled:

• DOE Order 5484.1, ENVIRONMENTAL PROTECTION, SAFETY AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS, dated 2-24-81;

• DOE Order 1332.2, UNIFORM REPORTING SYSTEM FOR FEDERAL ASSISTANCE, dated 10-31-83;

• DOE Order 5700.5A, POLICY AND MANAGEMENT PROCEDURES FOR FINANCIAL INCENTIVE PROGRAMS, dated 6-8-92; and

• HQ 1325.1, ACTION COORDINATION AND TRACKING SYSTEM, dated 7-30-79.