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### 1nc—elections da

#### Obama’s ahead but the race is close---voters are paying attention which means the plan could cause a shift

Cooper 10/25 Michael is a writer at the New York Times’ Caucus blog. “Has Romney’s Rise in Polls Stopped?” 2012, http://thecaucus.blogs.nytimes.com/2012/10/25/has-romneys-rise-in-polls-stopped/?gwh=20374120E0C2B79985262EFF8E8CD19D

A debate has been raging among polling analysts and commentators about whether Mitt Romney is still gaining ground, as he did after the first debate, or if his bounce has slowed or stalled. But while some Republicans say that they still have the wind at their backs, several polling analysts weighed in recently to argue that the data suggests there is no longer a Romney surge.¶ Mark Blumenthal, the senior polling editor of the Huffington Post and the founding editor of Pollster.com, wrote a piece this morning with the headline: “Presidential Polls Counter Romney Surge Myth.”¶ “While Romney gained significantly in the wake of the first presidential debate in early October,’’ he wrote, “the lack of a continuing trend over the past two weeks helps counter a theme in some campaign coverage that Romney’s support continues to ‘surge’ nationwide.”¶ Sam Wang, who analyzes state polls at the Princeton Election Consortium, wrote this week that the Mr. Obama’s plunge after the first debate had stopped with him still ahead, and delivered the following verdict: “Indeed the race is close, but it seems stable. For the last week, there is no evidence that conditions have been moving toward Romney. There is always the chance that I may have to eat my words — but that will require movement that is not yet apparent in polls.”¶ Nate Silver, who writes the FiveThirtyEight blog in The New York Times, wrote Thursday: “Mr. Romney clearly gained ground in the polls in the week or two after the Denver debate, putting himself in a much stronger overall position in the race. However, it seems that he is no longer doing so.”¶ With the race so close in so many places, it can be difficult to assess the true state of play. ¶ Most major national polls, with the exception of a few tracking polls, have shown the race to be essentially tied for months. Some polls in crucial swing states where Mr. Obama has been leading have tightened between the two candidates since the first debate, including Ohio, which is closer than it was a month ago. And now is the point where many voters pay more attention to the election, which can move the polls. But even with the proliferation of polls and the increased reliance on aggregated polls — lumping or averaging many polls together — it can be difficult to get a realistic picture on any given day in the closing weeks, given that some polls do not reach voters who use only cellphones, and many polls have struggled in an environment where fewer people want to respond to questions.

#### Advocating nuclear would be election suicide for Obama---he’s backing off it now

Levine 9/7 Gregg is a contributing editor and former managing editor of Firedoglake. “Obama Drops Nuclear from Energy Segment of Convention Speech,” 2012, http://capitoilette.com/2012/09/07/obama-drops-nuclear-from-energy-segment-of-convention-speech/

That Duke’s CEO thought to highlight efficiency is interesting. That President Obama, with his well-documented ties to the nuclear industry, chose not to even mention nuclear power is important. In the wake of Fukushima, where hundreds of thousands of Japanese have been displaced, where tens of thousands are showing elevated radiation exposure, and where thousands of children have thyroid abnormalities, no one can be cavalier about promising a safe harnessing of the atom. And in a world where radioisotopes from the breached reactors continue to turn up in fish and farm products, not only across Japan, but across the northern hemisphere, no one can pretend this is someone else’s problem. Obama and his campaign advisors know all this and more. They know that most industrialized democracies have chosen to shift away from nuclear since the start of the Japanese crisis. They know that populations that have been polled on the matter want to see nuclear power phased out. And they know that in a time of deficit hysteria, nuclear power plants are an economic sinkhole. And so, on a night when the president was promised one of the largest audiences of his entire campaign, he and his team decided that 2012 was not a year to throw a bone to Obama’s nuclear backers. Obama, a consummate politician, made the decision that for his second shot at casting for the future, nuclear power is political deadweight.

#### Romney decks US-Russia Relations – threatens global insecurity, prolif, and extinction

Felton 12 Emmanuel Felton is a Toni Stable Fellow at the Columbia School of Journalism. "Mitt Romney Russia Quotes Signal Big Problems For Future US-Russian Relations," March, http://www.policymic.com/articles/6202/mitt-romney-russia-quotes-signal-big-problems-for-future-us-russian-relations

The importance of America’s alliance with Russia is highlighted by the very context of Obama and Medvedev’s conversation. Obama and Medvedev were speaking in private at the Nuclear Security Summit in Seoul, South Korea. Russia is an important U.S. ally in fight against nuclear proliferation. Of the nearly 20,000 nuclear weapons that are in existence, Russia has 10,000 and the United States 8,500. Most will agree that this number is simply far too high. An alliance with Russia is essential to reducing the cold-war stockpile of nuclear weapons that continue to threaten humanity. Flexibility is critical to any alliance. Despite the strategic importance of a relationship with Russia, Republicans have signaled that any compromise on the issue of the missile defense system will be a non-starter if they gain control of the White House and Capitol Hill. The initial criticisms of Obama’s comments went something like this: “What plans are he formulating, that make his “last election” relevant? What is he planning to do that, if the American people were aware of it, would make him unelectable?” While the initial responses to Obama’s comments were purely motivated by November’s elections, Mitt Romney’s remarks went much further. Romney called Russia America’s “number one geopolitical foe.” While you could argue that this is another etch-a-sketch moment, Romney’s comments show a complete disregard for any U.S.-Russian alliance. Romney’s comments are particularly important because he is the most likely to succeed Obama in the fall. His comments have signaled to the world that Republicans don’t necessarily believe that any alliance exists in the first place. This gives Russia free reign to take more hardline positions on nuclear proliferation issues. While Romney’s comments were clearly motivated by election year politics, they also indicate that the party has not escaped Cold War thinking, an approach that says any compromise with Russia is tantamount to weakening America’s strategic position. Until that mindset is broken, global security will continue to be undermined by an increasingly hostile Kremlin.

### 1nc—adv cp

#### The United States federal government should develop and acquire, as rapidly as possible, a conventional prompt global strike capability, space-based quantum gradiometry capabilities, and synthetic aperture radar with Ground Movement Target Indicator and Surface Moving Target Indicator capabilities. The United States federal government should reduce corporate tax laws to incentivize entrepreneurship and small businesses. The United States federal government should fully fund the Small Business Administration.

#### Entrepreneurs are the pillars of economic development

Moutray, 9 (Chad, Chief economist and director of research for the Office of Advocacy of the United States Small Business Administration (SBA), entrepreneurship in a global economy: looking ahead: opportunities and challenges for entrepreneurship and small business owners, 31 W. New Eng. L. Rev. 763, Lexis)

II. Opportunities

This section will outline five opportunities that small businesses will hopefully pursue in the next decade. These include (1) increasing investments in technology and innovation, (2) grooming local entrepreneurs for growth ("economic gardening"), (3) pursuing new markets overseas, (4) promoting entrepreneurship among women, minorities, veterans, and immigrants, and (5) advancing education and training.

A. Increasing Investments in Technology and Innovation

 Many economic development officials are seeking the "next big thing" that will drive their local and regional economies for years to come. Research shows that universities that invest heavily in research and development tend to inspire new firm formations in the areas that surround them, n47 and governments now regularly promote technology transfer as an important component of economic development. n48 Furthermore, regions with greater entrepreneurial growth have been associated with higher levels of innovation and technology use, n49 and states that promote new firm formation through public policy are more likely to experience higher employment, incomes, and overall output. n50 Therefore, policymakers of both political parties understand that risk-taking entrepreneurs have a positive impact on regional economic development. n51

These entrepreneurial ventures, especially the university spin-offs, depend on new inventions. One way to track the propensity to invent is through patent filings. A new study being released by the United States Small Business Administration's Office of Advocacy shows that forty percent of the companies that issued at least fifteen [\*773] patents over a five-year period were small businesses. n52 In addition, these small firms produced significantly more patents per employee than the larger firms in the sample. n53 This and other studies show that small businesses are more likely to develop emerging technologies than their larger counterparts. The authors of the new study observe that "small firms are more likely to attempt to build a business around a new emerging technology, whereas in general [it appears] large firms work on emerging technologies in order to improve an existing product line or business unit." n54 That study identifies emerging industries that favor small businesses, including: imaging and display, nanotechnology, photonics and optical components, and biomedical and biotechnology pipeline firms. n55 Thus, small firms are actively engaged in the cutting-edge technologies that will shape our future growth. These findings are not new, as they have been documented before in earlier Office of Advocacy research. n56 But it is encouraging to note that they are consistent with past results. A previous study from this office, for instance, found that industries that heavily employ scientists and engineers are "more accommodating to small fast growing private firms"; whereas, larger production-focused industries tend to have more large firms. n57 Innovation and entrepreneurship have provided a strong foundation for economic growth in the United States, and the Office of Advocacy has been committed to studying this relationship. In fact, one of the first reports that this office released was a 1979 report from a task force on small business and innovation. n58 Among its conclusions, it stated that:

 [\*774] Innovation is an essential ingredient for creating jobs, controlling inflation, and for economic and social growth.

Small businesses make a disproportionately large contribution to innovation. There is something fundamental about this unusual ability of small firms to innovate that must be preserved for the sake of healthy economic and social growth. n59

Nearly thirty years later those words are still true. Innovations are still vital to our economic growth, and they will provide the tools to make our economy more competitive in an increasingly globalized marketplace. Moreover, it is the risk-taking entrepreneur who will often champion these innovations, helping to drive our American economy forward.

#### Conventional PGS solves prolif

Dagobert L. Brito, Political Econ Prof @ Rice, and Michael D. Intriligator, Econ Prof @ UCLA, 3-1-2010, “Conventional Trident Modification Program,” Huffington Post, http://www.huffingtonpost.com/dagobert-l-brito/conventional-trident-modi\_b\_480660.html

Global Zero has the support of the Obama Administration and was the subject of President Obama's April 5, 2009 speech in Prague following a joint statement of Presidents Obama and Medvedev committing their two countries to achieving a nuclear free world." On the surface this idea is appealing. It is hard to imagine what could be wrong with a policy to eliminate nuclear warheads whose only purpose is either to kill tens of thousands of people or to destroy an opponent's nuclear warheads. Paradoxically, however, a world without nuclear weapons could be one that is very dangerous and unstable. It is our belief that one way to make Global Zero possible is for the United States to invest in developing a non-nuclear response to a nation that acquires a small number of nuclear weapons and uses the existence of these weapons to extort economic or political concessions, such as in the current world situation North Korea and potentially Iran. One possible way to do this is to deploy a weapon such as the Conventional Trident Modification (CTM) Program. As we will argue, Trident missiles carrying non-nuclear kinetic warheads could deter a country from clandestinely attempting to acquire, deploy and then use a small number of nuclear weapons for political purposes. There is a very technical literature that was primarily motivated by the Cold War, and some of the results of this body of work are applicable to the current global situation. One of the more important results is that the probability of war is high in a conflict situation where the parties have very few nuclear weapons, or even worse, where only one of the parties has even a few such weapons, which was the only situation in which such weapons were used, by the U.S. against Japan in 1945. During the Cold War, this observation led to the doctrine of Mutual Assured Destruction or "MAD". As a result, both sides invested in a large number ICBM, bomber and missile-carrying submarines so as to have a survivable second- strike capability. It may be possible to negotiate a treaty to eliminate nuclear weapons, however it is impossible to eliminate the technology for the manufacture of nuclear weapons and the knowledge of how to do this that is widespread and available on the Internet. Given current technology, a country with a stockpile of fissile material could be able to produce nuclear weapons in a matter of months. In a situation where no country has nuclear weapons, a rogue country could clandestinely produce a small number of weapons, given. Most of the technology needed to produce such weapons is dual-use, involving both civilian and potential military use. Thus the boundary between the capability needed to produce nuclear weapons and having such weapons has been blurred. There have been recent attempts to change the threshold from the actual acquisition of nuclear weapons that is banned by the Nuclear Nonproliferation Treaty, to the acquisition of the capability to construct nuclear weapons. This is difficult, however, since the exact boundary that differentiates general knowledge from knowledge specific to producing nuclear weapons is not well defined and it becomes less defined as technology progresses. Furthermore, technical change will continue to progress. Computers will continue to become more powerful, and computer-controlled machine tools will become more common and less expensive. The only substantial barrier to building nuclear weapons may be access to fissile material. If climate change lead to an increased dependence in nuclear power then it may become more difficult to restrict access to fissile material. MAD worked during the Cold War. We will never know whether the doctrine was sound or we were just lucky. If the doctrine worked, it required a high degree of rationality and sophistication on the part of the nations involved. This may not be the case if among the processors of nuclear weapons is a politically unstable rogue state. This creates a dilemma: In a world where nuclear weapons are eliminated, a country may be tempted to clandestinely build a small stockpile of nuclear weapons for bargaining purposes. We believe, however, that there may be a way to avoid this dilemma. It may not be possible to prevent a nation state from having the capability to build nuclear weapons. We believe, however, that it is possible to develop non-nuclear weapons systems that are credible and powerful enough to serve as an effective deterrent to any nation contemplating building a small number of nuclear weapons to extort political or economic concessions. Such as system would initially serve as a deterrent to nuclear proliferation and may, in fact, make Global Zero stable. Credibility is crucial in this area. The very elements that may have made the MAD doctrine viable reduce its credibility vis-à-vis a rogue nuclear nation. It is no longer credible that the United States or any of the major powers would use nuclear weapons to retaliate against the infrastructure and population of a rogue nation that used or threaten to use nuclear weapons. Nuclear weapons have only been used at the end of WWII, by the U.S. against Japan. The decision to drop two atomic bombs in Japan is still a subject of considerable controversy. It was, however, in many ways, a logical extension of existing practices of the time. The atomic bomb was seen as a means to destroy the enemy's cities, industries, and, especially, its will to fight. The bomb did what was already being done using conventional weapons by both sides in the war. In fact, more people were killed in the firebomb raids on Tokyo than by both atomic bombs. The special horrors and the threat to the human gene pool and the environment associated with radiation were not known or well understood at the time. After the war, the scientific and military communities as well as moral and political philosophers pondered the implications of nuclear weapons. It became clear that nuclear weapons were not a very effective means for a nation to use in pursuit of its political and economic objectives. It became necessary to develop complicated and sophisticated strategic doctrines so as to rationalize the acquisition and deployment of these weapons. Ultimately, it was seen by Bernard Brodie, Carl Kaysen, and others that the role of nuclear weapons was primarily to deter their use by other nations. Although weapons designers eventually developed warheads that were "clean" and potentially useful on the battlefield as tactical nuclear weapons, the concept of a nuclear threshold that could not be crossed except at a high cost became ingrained in the strategic thinking of the mid-twentieth century. The nuclear threshold was so well defined and accepted that a small and poor country like North Vietnam was able to inflict a political defeat on the United States without fear of its use of nuclear weapons. Nuclear weapons did not prove to be an effective instrument of war or policy, whether by the United States in Vietnam or by the Soviet Union in Afghanistan or currently by the U.S. in Iraq and Afghanistan. The existence of a large stockpile of United States nuclear weapons was not a credible deterrent to their political use by minor rogue nuclear powers. In 1985 we first proposed that the U.S. reconfigure submarine-launched ballistic missiles with conventional warheads that could provide a non-nuclear deterrent that was politically credible. In 2002, together with another coauthor, we wrote a paper published by the Baker Institute at Rice University that proposed that the United States reconfigure some of its Trident II missiles to deliver kinetic energy warheads. (Anyone interested in the details of the proposal can find it on the Baker Institute website.) That proposal was sent to the Office of the Secretary of Defense. In 2006 the Department of Defense received funding to start to develop such a weapon in the Conventional Trident Modification (CTM) Program. The proposal differed from ours in two very important ways. First, the warheads are smaller to extend the range and, second, only a few missiles in any ballistic missile submarine would be conventional. Thus the missiles submarines would be carrying would be including both conventional and nuclear warheads. Congress has objected to the deployment of the CTM is that it could be destabilizing, as it would be impossible to differentiate between the launch of a conventional weapon and nuclear weapon. This could, indeed, be a problem if the Navy deploys submarines with a mix of nuclear and conventionally-armed missiles and launches from a location normally associated with the patrol area of submarines carrying nuclear missiles in a deterrence role. This would also require that the warhead have the same weight as the nuclear payload because it would not be possible to reduce its range. Our proposal differs in that we argue that all the missiles on a submarine be converted to CTM missiles and thus the submarines could be deployed closer to the possible targets and use larger warheads. The trajectories of a missile launch from a CTM submarine would be different from that of a nuclear-armed missile boat on patrol. Few, if any of our potential adversaries have any significant anti-submarine capability, so it would be possible to move the submarines close to their coast prior to attacking, constituting an effective deterrent. If the submarines were only carrying non-nuclear warheads, then it would be in the interest of the United States could allow other major nuclear powers to verify that the submarine was carrying non-nuclear warheads. It would be in the interest of the United States to make public - within limits - the location of the submarine. It should be remembered that the role of a CTM missile submarine would be very different from the role of a missile submarine whose mission is to insure the survivability of the United States second-strike capability. Rather, as a show of force, a potential adversary should know that conventionally-armed submarines are on patrol in the immediate vicinity. Congress commissioned the National Academy of Science to do a study of the CTM and in that study, its 2008 report stated: Major Finding 1. There are credible scenarios in which the United States could gain meaningful political and strategic advantages by being able to strike with conventional weapons important targets that could not be attacked rapidly by currently deployed military assets. In light of the appropriately extreme reluctance to use nuclear weapons, conventional prompt global strike (CPGS) could be of particular value in some important scenarios in that it would eliminate the dilemma of having to choose between responding to a sudden threat either by using nuclear weapons or by not responding at all. We believe that if the Navy is willing to dedicate some of its nuclear submarines to a CTM role and eliminate the ambiguity that has troubled members of Congress, then we should fund the deployment of the CTM. This not only reduces the value of a few nuclear weapons to a rogue state, it also makes possible the stability of Global Zero in the future.

### 1nc—dd&e cp

#### The United States federal government should provide full upfront funding for all robust detailed design and engineering efforts for small modular reactors as well as all licensing costs. The scope of such detailed design and engineering effort will include preparation of construction drawings; the specification of system components; procurement engineering, including the preparation of bid packages for suppliers; a general site layout, and all nonrecurring design and engineering work at the manufacturing site.

#### The counterplan alone is key---DD&E needs to be done before reactor technologies are licensed---otherwise the plan produces risky premature technology

Robert Rosner 11, the William E. Wrather Distinguished Service Professor in the departments of Astronomy & Astrophysics and Physics at the University of Chicago; and Stephen Goldberg, Special Assistant to the Director at Argonne National Laboratory, November 2011, “Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.,” <http://epic.uchicago.edu/sites/epic.uchicago.edu/files/uploads/SMRWhite_Paper_Dec.14.2011copy.pdf>

The study team synthesized the knowledge gained from analysis of the SMR learning process, economics, and market transformation opportunities into a five-stage business model for achieving SMR commercialization. Figure 6 shows a schematic of the model, highlighting the source of financing for each stage. The five stages are discrete and provide DOE stage-gated decision-making opportunities on going forward based on the performance of each preceding stage. Specific performance objectives can be established for each stage to enable policy-makers and private sector stakeholders to assess performance and determine whether continued implementation is justified.

x Stage 1. Detailed Design and Engineering (DD&E) and Licensing: This stage encompasses the full range of technical and regulatory work required to achieve NRC approval of SMR designs, site licenses, and preparations to commence site construction. The development of a design certification package for submission to the NRC is the critical component of this effort, but as discussed earlier, the full scope of DD&E activities is much more expansive than preparation of the certified design documents. The study team estimates that the total cost of DD&E for each SMR technology option is up to $1 billion, including the necessary engineering work to integrate the SMR design with the design of the SMR manufacturing facility. As discussed further in Appendix C, the front-end development costs for bringing SMR technology to the point of initial deployment are relatively large. When judging the ability of the U.S. nuclear vendor community to shoulder the financial risk, the study team found that the size of the SMR investment would be a significant hurdle for these companies. The study team believes that a federal government role to cost share DD&E activities is appropriate. The study team identified four possible LWR-derived SMR designs that appear promising, but has not yet completed sufficient analysis to support a decision on federal support. In view of the current budgetary constraints on federal funding, the study team believes that the federal government can invest its resources most effectively by supporting a competition among multiple SMR technology teams. The competition could be structured in phases, with an early, relatively low-cost phase supporting a larger number of SMR teams, with a subsequent phase (leading to final design and licensing approvals by the NRC) limited to no more than two teams. The down-selection process may become self-selection, as further DD&E reveals the relative differences among the SMR options. The study team believes that the achievement of both the design certification and the combined operating license by at least two design teams is a necessary condition to move ahead to the next stage; comparing at least two designs against one another mitigates the considerable technology risks carried by premature selection. 57 The business plan model assumes that the cost for funding this stage would be shared on a 50-50 basis between the federal government and the SMR vendors. Given current budget constraints, the government could lower its investment by limiting the scope of activities eligible for cost sharing, or reducing the cost share, or both. For example, the costs for detailed engineering, necessary to support construction planning but not directly needed to support NRC certification, could be excluded; site specific licensing costs, such as the COL, also could be excluded from cost sharing. The business plan does not contain specific recommendations on the scope of included and excluded costs; these decisions are better left to negotiations between the SMR design teams and DOE, based on the available level of federal government funding. In any event, the government also may want to consider placing a firm cap on the level of federal assistance to be provided at this stage. Success at this stage would be measured on the basis of successful licensing and completion of detailed engineering that meets specific technical and cost targets.

#### That’s key to avoid accidents and project failures

David Biello 12, Associate Editor, Scientific American, 3/27/12, “Small Reactors Make a Bid to Revive Nuclear Power,” http://www.scientificamerican.com/article.cfm?id=small-reactors-bid-to-revive-nuclear-power&print=true

But multiple reactor sites proved problematic at Fukushima Daiichi, where an accident in one rapidly became a crisis for multiple reactors and spent fuel pools. "If you're going to have multiple reactors, are you going to gain in safety or lose in safety?" asks physicist M.V. Ramana of Princeton University. "We don't know."

"Early in the discovery of any new technology you have this rosy picture that is formed," Candris admits of small modular reactors. "In the early days of nuclear, there were people out there saying it would be too cheap to meter. We found out otherwise."

Alternative fuel?

Small modular reactors may help with two of the biggest challenges facing the nuclear industry: the growing stores of waste from existing reactors and residue from the mass production of nuclear weapons as well as the overall safety of nuclear power. GE's PRISM fast reactor, General Atomic's helium-cooled fast reactor, or Hyperion Power's liquid lead-bismuth cooled reactor could all turn waste into fuel. Hyperion hopes to demonstrate its reactor, capable of generating 25 megawatts of electricity, at the Savannah River National Laboratory in South Carolina. The site has also signed memorandums of understanding to host prototypes of the NuScale and Holtech reactors.

Mini-nuke

A modern pressurized water reactor, like the two being built in Georgia, can pump out more than 1,000 megawatts worth of power using the heat from fission to boil water to spin a turbine. Babcock & Wilcox—one-time builder of large pressurized water reactors as well as smaller ones suitable for the submarines of the U.S. Navy—would like to shrink those down to just 180 megawatts. "It's not for lack of knowledge of how to build big reactors," says Chris Mowry, president of B&W Modular Nuclear Energy.

Instead, B&W suggests that the fundamental problem facing the adoption of nuclear power is not the technology itself, but the financial risk of committing to a build a big nuclear reactor. Simply put, even the largest utilities do not have the capital to build a $7 billion reactor, and such large projects have a tendency to see costs balloon as projects are delayed. A case in point is the Tennessee Valley Authority's bid to complete a second reactor at its Watts Bar Nuclear Power Plant. The reactor, first begun in the 1970s and resumed in 2007, is behind schedule and "will cost more than forecast," admits TVA spokesman Terry Johnson. "It's a size issue," Mowry argues.

Such nuclear batteries could in principle be sealed, placed in the ground, and run for a decade before being swapped out for an entirely new modular reactor. And if manufactured in a factory, they could also be cheap. "There is no inherent reason why nuclear power needs to be expensive," Bill Gates, who has invested in the novel reactor proposed by TerraPower, told the ARPA–e summit on February 28, noting that nuclear's relative expense largely derives from building in safety features.

Evaluating the safety of such new reactors will take time, of course, and the U.S. Nuclear Regulatory Commission has yet to receive an application from any of the would-be vendors of small modular reactors, whether fast reactors or scaled-down light-water reactors. And staffing requirements, emergency planning and clean-up funds, among other issues, remain to be worked out between the reactor makers and the NRC—a key component of reducing the cost of such reactors. "The staff has contended pretty much all along that they will have to meet the same security requirements as all of the large reactors," says Michael Mayfield, director of the Division of Advanced Reactors and Rulemaking in the NRC's Office of New Reactors, noting that a timeline for licenses could be expedited if such reactors are simply scaled down versions of existing light water reactors that do not require new regulations. "Why would it take so long to review something that is substantially smaller with fewer parts? That however is based on the notion that vendors submit complete, high quality applications and address staff concerns more quickly than we have been able to do with some of the large [reactor] designs."

By eliminating human intervention—through passive safety features that kick in without the help of operators—staffing requirements might be cut. And if buried or otherwise hardened, the need to pay security guards might also be reduced. "If you need humans to do something, that is not a good design," Gates argued at the ARPA-e conference.

Ultimately, the success or failure of such scaled-down designs may relate to manpower. "If you need the same overhead to run 100 megawatts as you do to run a 1000, that's economically problematic," notes William Johnson, CEO of Progress Energy, a utility considering whether to build new nuclear power plants in future.

The Homer Simpson factor

Of course, human error has yet to be eliminated from either operating reactors or those that exist only on paper. And, much as in airplane or pharmaceutical development, government decisions will determine whether these reactors succeed. Small modular reactors "becoming a reality are dependent on government and the nuclear industry," said NRC commissioner William Ostendorff in a speech to the American Nuclear Society conference this past November. "With respect to new reactor licensing, 'the devil is in the details.'"

#### The plan gets modeled globally---lack of effective design regulation causes worldwide Fukushimas

Marvin Fertel 9-18, President & CEO, Nuclear Energy Institute, 9/18/12, “Ensuring a Safe and Secure Future for Nuclear Energy,” Center for Strategic and International Studies, Lexis

And then both you and General Scowcroft referred to the other thing is right now **the rest of the world is building a lot more plants than us**. Secretary Poneman referred to the fact that he's been told that they like American technology. Well, they should. Our technology is still the most advanced technology. Our passive safety systems are more advanced than anybody else's. We also have the best operators in the world, and everybody's looking for a combination of operations plus technology.

And to be honest, I think **countries that are starting up ought to look to the Nuclear Regulatory Commission for the regulatory framework that they want**. One of the lessons learned out of Fukushima, not on the plant side but on the government side, was the lack of a very effective regulator. And we shouldn't have that happen anywhere else as we go forward.

#### That collapses peaceful nuclear applications globally

Graham Allison 8, Harvard Belfer Center for International Affairs and Science Director, JFK Government Professor, and T.P. Sreenivasan, Former UN and Vienna Ambassador, Brookings Visiting Fellow, May 2008, IAEA Commissioned Independent Report prepared by a panel of 22 nonproliferation experts, Allison and Sreenivasan Executive Directors, “Reinforcing the Global Nuclear Order for Peace and Prosperity: The Role of the IAEA to 2020 and Beyond,” http://belfercenter.ksg.harvard.edu/publication/18333/reinforcing\_the\_global\_nuclear\_order\_for\_peace\_and\_prosperity.html?breadcrumb=%2Fproject%2F3%2Fmanaging\_the\_atom

As Chernobyl showed, a nuclear accident anywhere is a nuclear accident everywhere.13 A major accidental release of radioactivity could cause widespread suffering and economic disruption, and undermine prospects for large-scale growth in peaceful nuclear applications. Member states and the IAEA must do everything they can to ensure that such an accident never occurs again.

#### Peaceful nuclear applications key to global food security

Graham Allison 8, Harvard Belfer Center for International Affairs and Science Director, JFK Government Professor, and T.P. Sreenivasan, Former UN and Vienna Ambassador, Brookings Visiting Fellow, May 2008, IAEA Commissioned Independent Report prepared by a panel of 22 nonproliferation experts, Allison and Sreenivasan Executive Directors, “Reinforcing the Global Nuclear Order for Peace and Prosperity: The Role of the IAEA to 2020 and Beyond,” http://belfercenter.ksg.harvard.edu/publication/18333/reinforcing\_the\_global\_nuclear\_order\_for\_peace\_and\_prosperity.html?breadcrumb=%2Fproject%2F3%2Fmanaging\_the\_atom

Nuclear techniques have also contributed significantly to improving global food security and safety. The IAEA, through its partnership with the Food and Agriculture Organization of the United Nations, has played an indispensable role not only in developing nuclear technology but also in building capacity and transferring technology to member states for key agricultural projects. The goals of these projects include improving the efficiency and sustainability of land and water management; breeding new crops with special qualities and adapted to marginal environments; improving animal production and health; controlling insects that are major pests of plants and livestock; and increasing food safety while facilitating international trade.

Global food supplies and agricultural resources will increasingly come under pressure from climate change and an expanded demand for food, feed, and biofuels from a growing world population. Nuclear techniques can be used to provide accurate information on the efficiency of land and water management practices, which can be used to adapt to climate change and enhance food and biofuel production. To preserve agricultural resources and the environment, isotopic techniques will increasingly be important to develop efficient management strategies for water – including groundwater – and soils. The IAEA’s activities to induce mutations for improving crop productivity will become more important to develop crop varieties that can grow under the harsher conditions brought about by climate change and on marginal lands not yet exploited for agriculture. Since most of the IAEA’s member states do not have the mature capacity to use these nuclear techniques, the involvement of the Agency in building capacity and transferring techniques for more efficient land and water management – which are considered to be in the “public good” domain – will remain crucial for sustainable agriculture and the socio-economic stability of these member states.

Nuclear techniques can also help increase agricultural productivity by reducing the major losses that are caused by plant and animal pests and diseases. Techniques for diagnosing transboundary animal diseases, focusing on nuclear and nuclear-related molecular technologies, will be increasingly important for early and rapid detection in both the laboratory and the field. Area-wide application of the Sterile Insect Technique (SIT) to protect crops and livestock from pests is a unique technology in which the Agency has global leadership and an excellent track record. Expanding international agricultural trade will increasingly require the integration of pre- and post-harvest pest-control measures such as SIT and food irradiation, so that member states can meet regulations for international agricultural export markets.

#### Food crises cause global war and extinction

Lester R. Brown, 9, founder of the Worldwatch Institute and the Earth Policy Institute, May 2009, “Can Food Shortages Bring Down Civilization?” Scientific American

The biggest threat to global stability is the potential for food crises in poor countries to cause government collapse. Those crises are brought on by ever worsening environmental degradation

One of the toughest things for people to do is to anticipate sudden change. Typically we project the future by extrapolating from trends in the past. Much of the time this approach works well. But sometimes it fails spectacularly, and people are simply blindsided by events such as today's economic crisis.

For most of us, the idea that civilization itself could disintegrate probably seems preposterous. Who would not find it hard to think seriously about such a complete departure from what we expect of ordinary life? What evidence could make us heed a warning so dire--and how would we go about responding to it? We are so inured to a long list of highly unlikely catastrophes that we are virtually programmed to dismiss them all with a wave of the hand: Sure, our civilization might devolve into chaos--and Earth might collide with an asteroid, too! For many years I have studied global agricultural, population, environmental and economic trends and their interactions. The combined effects of those trends and the political tensions they generate point to the breakdown of governments and societies. Yet I, too, have resisted the idea that food shortages could bring down not only individual governments but also our global civilization.

I can no longer ignore that risk. Our continuing failure to deal with the environmental declines that are undermining the world food economy--most important, falling water tables, eroding soils and rising temperatures--forces me to conclude that such a collapse is possible. The Problem of Failed States   Even a cursory look at the vital signs of our current world order lends unwelcome support to my conclusion. And those of us in the environmental field are well into our third decade of charting trends of environmental decline without seeing any significant effort to reverse a single one. In six of the past nine years world grain production has fallen short of consumption, forcing a steady drawdown in stocks. When the 2008 harvest began, world carryover stocks of grain (the amount in the bin when the new harvest begins) were at 62 days of consumption, a near record low. In response, world grain prices in the spring and summer of last year climbed to the highest level ever.As demand for food rises faster than supplies are growing, the resulting food-price inflation puts severe stress on the governments of countries already teetering on the edge of chaos. Unable to buy grain or grow their own, hungry people take to the streets. Indeed, even before the steep climb in grain prices in 2008, the number of failing states was expanding [see sidebar at left]. Many of their problem's stem from a failure to slow the growth of their populations. But if the food situation continues to deteriorate, entire nations will break down at an ever increasing rate. We have entered a new era in geopolitics. In the 20th century the main threat to international security was superpower conflict; today it is failing states. It is not the concentration of power but its absence that puts us at risk.States fail when national governments can no longer provide personal security, food security and basic social services such as education and health care. They often lose control of part or all of their territory. When governments lose their monopoly on power, law and order begin to disintegrate. After a point, countries can become so dangerous that food relief workers are no longer safe and their programs are halted; in Somalia and Afghanistan, deteriorating conditions have already put such programs in jeopardy.Failing states are of international concern because they are a source of terrorists, drugs, weapons and refugees, threatening political stability everywhere. Somalia, number one on the 2008 list of failing states, has become a base for piracy. Iraq, number five, is a hotbed for terrorist training. Afghanistan, number seven, is the world's leading supplier of heroin. Following the massive genocide of 1994 in Rwanda, refugees from that troubled state, thousands of armed soldiers among them, helped to destabilize neighboring Democratic Republic of the Congo (number six).Our global civilization depends on a functioning network of politically healthy nation-states to control the spread of infectious disease, to manage the international monetary system, to control international terrorism and to reach scores of other common goals. If the system for controlling infectious diseases--such as polio, SARS or avian flu--breaks down, humanity will be in trouble. Once states fail, no one assumes responsibility for their debt to outside lenders. If enough states disintegrate, their fall will threaten the stability of global civilization itself.

### 1nc prolif adv

#### Global expansion of enrichment capability is the only way nuclear power can solve climate change---the plan reverses that

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

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

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

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

Implications for Uranium Enrichment

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

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

#### Extinction

Flournoy 12 – Citing Feng Hsu, PhdD NASA Scientist @ the Goddard Space Flight Center, Don FLournoy, PhD and MA from UT, former Dean of the University College @ Ohio University, former Associate Dean at SUNY and Case Institute of Technology, Former Manager for Unviersity/Industry Experiments for the NASA ACTS Satellite, currently Professor of Telecommunications @ Scripps College of Communications, Ohio University, “Solar Power Satellites,” January 2012, Springer Briefs in Space Development, p. 10-11

In the Online Journal of Space Communication , Dr. Feng Hsu, a  NASA scientist at Goddard Space Flight Center, a research center in the forefront of science of space and Earth, writes, “The evidence of global warming is alarming,” noting the potential for a catastrophic planetary climate change is real and troubling (Hsu 2010 ) . Hsu and his NASA colleagues were engaged in monitoring and analyzing climate changes on a global scale, through which they received first-hand scientific information and data relating to global warming issues, including the dynamics of polar ice cap melting. After discussing this research with colleagues who were world experts on the subject, he wrote: I now have no doubt global temperatures are rising, and that global warming is a serious problem confronting all of humanity. No matter whether these trends are due to human interference or to the cosmic cycling of our solar system, there are two basic facts that are crystal clear: (a) there is overwhelming scientific evidence showing positive correlations between the level of CO2 concentrations in Earth’s atmosphere with respect to the historical fluctuations of global temperature changes; and (b) the overwhelming majority of the world’s scientific community is in agreement about the risks of a potential catastrophic global climate change. That is, if we humans continue to ignore this problem and do nothing, if we continue dumping huge quantities of greenhouse gases into Earth’s biosphere, humanity will be at dire risk (Hsu 2010 ) . As a technology risk assessment expert, Hsu says he can show with some confidence that the planet will face more risk doing nothing to curb its fossil-based energy addictions than it will in making a fundamental shift in its energy supply. “This,” he writes, “is because the risks of a catastrophic anthropogenic climate change can be potentially the extinction of human species, a risk that is simply too high for us to take any chances” (Hsu 2010 )

#### Global nuclear renaissance won’t cause prolif---not even latent capabilities

Shahriman Lockman 12, Senior Analyst in the Foreign Policy and Security Studies programme, Institute of Strategic and International Studies, Malaysia, 4/12/12, “An exaggerated risk, yet a real one,” http://www.thebulletin.org/web-edition/roundtables/nuclear-option-the-developing-world-weighs-energy-needs-and-security-risks

As more and more countries in the developing world consider adopting nuclear power, Western governments and the nonproliferation community all too often exaggerate the attendant risks of weapons proliferation. So should concerns about the security implications of new nuclear power programs therefore be abandoned? My answer is no -- not when the resources, institutions, and attitudes needed to ensure nuclear security and safety remain in short supply in the developing world.

In his first essay for this Roundtable, P. R. Kumaraswamy asserted that few countries with nuclear energy programs have sought to develop nuclear weapons. He is correct. Indeed, nonproliferation scholar Matthew Fuhrmann recently analyzed 129 countries, some of which showed interest in nuclear power and some of which did not, between 1965 and 2000. He found little support for the notion that nations pursue nuclear energy in order to lay the foundation for future nuclear weapons programs. In other words, countries do not generally engage in nuclear hedging.

Thus, officials from developing countries are justifiably puzzled by the alarm with which their counterparts in the developed world view nuclear proliferation. The United States, in particular, often regards remote security threats -- including those stemming from nuclear proliferation and nuclear terrorism -- as if they were certainties, despite the fact that the world is arguably less dangerous today than ever before (particularly for the United States). Further, security expert Tom Sauer argues that Europe's nonproliferation policy since 9/11 has increasingly come to resemble that of the United States.

#### No impact to prolif---every actor has an incentive to overstate the impact

Robert Farley 11, assistant professor at the Patterson School of Diplomacy and International Commerce at the University of Kentucky, 11/16/11, “Over the Horizon: Iran and the Nuclear Paradox,” http://www.worldpoliticsreview.com/articles/10679/over-the-horizon-iran-and-the-nuclear-paradox

But states and policymakers habitually overestimate the impact of nuclear weapons. This happens among both proliferators and anti-proliferators. Would-be proliferators seem to expect that possessing a nuclear weapon will confer “a seat at the table” as well as solve a host of minor and major foreign policy problems. Existing nuclear powers fear that new entrants will act unpredictably, destabilize regions and throw existing diplomatic arrangements into flux. These predictions almost invariably turn out wrong; nuclear weapons consistently fail to undo the existing power relationships of the international system.

The North Korean example is instructive. In spite of the dire warnings about the dangers of a North Korean nuclear weapon, the region has weathered Pyongyang’s nuclear proliferation in altogether sound fashion. Though some might argue that nukes have “enabled” North Korea to engage in a variety of bad behaviors, that was already the case prior to its nuclear test. The crucial deterrent to U.S. or South Korean action continues to be North Korea’s conventional capabilities, as well as the incalculable costs of governing North Korea after a war. Moreover, despite the usual dire predictions of nonproliferation professionals, the North Korean nuclear program has yet to inspire Tokyo or Seoul to follow suit. The DPRK’s program represents a tremendous waste of resources and human capital for a poor state, and it may prove a problem if North Korea endures a messy collapse. Thus far, however, the effects of the arsenal have been minimal.

Israel represents another case in which the benefits of nuclear weapons remain unclear. Although Israel adopted a policy of ambiguity about its nuclear program, most in the region understood that Israel possessed nuclear weapons by the late-1960s. These weapons did not deter Syria or Egypt from launching a large-scale conventional assault in 1973, however. Nor did they help the Israeli Defense Force compel acquiescence in Lebanon in 1982 or 2006. Nuclear weapons have not resolved the Palestinian question, and when it came to removing the Saddam Hussein regime in Iraq, Israel relied not on its nuclear arsenal but on the United States to do so -- through conventional means -- in 2003. Israeli nukes have thus far failed to intimidate the Iranians into freezing their nuclear program. Moreover, Israel has pursued a defense policy designed around the goal of maintaining superiority at every level of military escalation, from asymmetrical anti-terror efforts to high-intensity conventional combat. Thus, it is unclear whether the nuclear program has even saved Israel any money.

The problem with nukes is that there are strong material and normative pressures against their use, not least because states that use nukes risk incurring nuclear retaliation. Part of the appeal of nuclear weapons is their bluntness, but for foreign policy objectives requiring a scalpel rather than a sledgehammer, they are useless. As a result, states with nuclear neighbors quickly find that they can engage in all manner of harassment and escalation without risking nuclear retaliation. The weapons themselves are often more expensive than the foreign policy objectives that they would be used to attain. Moreover, normative pressures do matter. Even “outlaw” nations recognize that the world views the use of nuclear -- not to mention chemical or biological -- weapons differently than other expressions of force. And almost without exception, even outlaw nations require the goodwill of at least some segments of the international community.

Given all this, it is not at all surprising that many countries eschew nuclear programs, even when they could easily attain nuclear status. Setting aside the legal problems, nuclear programs tend to be expensive, and they provide relatively little in terms of foreign policy return on investment. Brazil, for example, does not need nuclear weapons to exercise influence in Latin America or deter its rivals. Turkey, like Germany, Japan and South Korea, decided a long time ago that the nuclear “problem” could be solved most efficiently through alignment with an existing nuclear power.

Why do policymakers, analysts and journalists so consistently overrate the importance of nuclear weapons? The answer is that everyone has a strong incentive to lie about their importance. The Iranians will lie to the world about the extent of their program and to their people about the fruits of going nuclear. The various U.S. client states in the region will lie to Washington about how terrified they are of a nuclear Iran, warning of the need for “strategic re-evaluation,” while also using the Iranian menace as an excuse for brutality against their own populations. Nonproliferation advocates will lie about the terrors of unrestrained proliferation because they do not want anyone to shift focus to the manageability of a post-nuclear Iran. The United States will lie to everyone in order to reassure its clients and maintain the cohesion of the anti-Iran block.

None of these lies are particularly dishonorable; they represent the normal course of diplomacy. But they are lies nevertheless, and serious analysts of foreign policy and international relations need to be wary of them.

Nonproliferation is a good idea, if only because states should not waste tremendous resources on weapons of limited utility. Nuclear weapons also represent a genuine risk of accidents, especially for states that have not yet developed appropriately robust security precautions. Instability and collapse in nuclear states has been harrowing in the past and will undoubtedly be harrowing in the future. All of these threats should be taken seriously by policymakers. Unfortunately, as long as deception remains the rule in the practice of nuclear diplomacy, exaggerated alarmism will substitute for a realistic appraisal of the policy landscape.

#### No rapid prolif---dangerous states are terrible at proliferating

Jacques E.C. Hymans 12, Assistant Professor in the School of International Relations at the University of Southern California, 4/16/12, “North Korea's Lessons for (Not) Building an Atomic Bomb,” http://www.foreignaffairs.com/print/134657

The dismal failure of North Korea's April 13 long-range missile test -- it broke into pieces after 81 seconds [1] of flight time -- has also exposed the poverty of standard proliferation analyses. In the days leading up to the test, most commentators apparently took Pyongyang's technological forward march for granted. Even the more sober voices [2] evinced little doubt that this test would go at least as well as the country's 2009 effort, which managed to put a rocket into flight for about fifteen minutes before it malfunctioned. Meanwhile, other technical experts regaled readers with tales of the "emerging" [3] bona fide North Korean intercontinental ballistic missile [4]force, which might soon be able to target the continental United States. And there were renewed calls for the United States and its East Asian allies to embrace the "Israeli option" [5]: pre-emptive military strikes against North Korean strategic weapons facilities. The actual results of the test, however, demonstrate that the analysts' nightmare scenarios were hardly more credible than North Korea's own propaganda volleys.

To be sure, a single technical failure need not condemn an entire strategic weapons program. Pyongyang's missile mishap, however, was not a lone failure; it was merely the latest in a long line of botched strategic weapons tests. The country's long-range missile test record [7] is frankly pathetic: a total failure in 2006, a partial failure in 2009, and a total failure in 2012. (A 1998 test of a medium-range missile that had been jerry-rigged to fly a longer distance was also a partial failure.) And its nuclear test record is almost as bad: a virtual fizzle [8] in 2006, and a very modest blast at best [9] in 2009.

Amazingly, the assumption that Pyongyang already owns the very weapons that it has consistently failed to demonstrate has long driven U.S. policy. The Clinton administration's North Korea diplomacy was based on the belief that there was a "better than even chance" [10] that Pyongyang had built the bomb. The George W. Bush administration then ripped up the Clinton-era policy because it thought that the North Koreans had cheated [11] and built even more bombs than Clinton realized. Most recently, Secretary of State Hillary Clinton has gone so far as to state that "we know" [12] that Pyongyang possesses "between one and six nuclear weapons," creating the impression that new leader Kim Jong Un could give the order to take out Seoul or Tokyo at any time. Given Washington's blind certainty about the North Korean menace, it is little wonder that few analysts anticipated its latest belly flop.

Washington's miscalculation is not just a product of the difficulties of seeing inside the Hermit Kingdom. It is also a result of the broader tendency to overestimate the pace of global proliferation. For decades, Very Serious People have predicted [13] that strategic weapons are about to spread to every corner of the earth. Such warnings have routinely proved wrong -- for instance, the intelligence assessments that led to the 2003 invasion of Iraq -- but they continue to be issued. In reality, despite the diffusion of the relevant technology and the knowledge for building nuclear weapons, the world has been experiencing a great proliferation slowdown. Nuclear weapons programs around the world are taking much longer to get off the ground -- and their failure rate is much higher -- than they did during the first 25 years of the nuclear age.

As I explain in my article "Botching the Bomb [14]" in the upcoming issue of Foreign Affairs, the key reason for the great proliferation slowdown is the absence of strong cultures of scientific professionalism in most of the recent crop of would-be nuclear states, which in turn is a consequence of their poorly built political institutions. In such dysfunctional states, the quality of technical workmanship is low, there is little coordination across different technical teams, and technical mistakes lead not to productive learning but instead to finger-pointing and recrimination. These problems are debilitating, and they cannot be fixed simply by bringing in more imported parts through illicit supply networks. In short, as a struggling proliferator, North Korea has a lot of company.

#### No Middle East war

Salem 11—Director of the Carnegie Middle East Center. PhD from Harvard (Paul, 'Arab Spring' Has Yet to Alter Region's Strategic Balance, carnegie-mec.org/publications/?fa=43907)

Despite their sweeping repercussions for both domestic and international players, the Arab uprisings have not led to a dramatically new regional order or a new balance of power. This could change, particularly if developments in Syria continue to escalate.

While Iran has welcomed uprisings against Western-backed regimes in Egypt and Tunisia, it dealt harshly with its own protesters and has been worried about recent events in Syria. Moreover, countries that threw out pro-Western dictators are not moving closer to Iran.

Egypt's and Tunisia’s future foreign policies are more likely to resemble Turkey's in becoming more independent while remaining allied with the West. And Iran's soft power has decreased as its regime looks increasingly repressive and new models of revolutionary success have emerged in Tunisia, Egypt, and other parts of the Arab world.

Turkey, for its part, bungled the opportunity to take advantage of this historic shift to bolster its influence in the Arab world. The Arab uprisings are effectively calling for the Arab world to be more like Turkey: democratic, with a vibrant civil society, political pluralism, secularism alongside Islam, and a productive and fairly balanced economy. However, after expressing clear support for Egyptian protesters, Turkey has hedged its bets in Libya and Syria.

Turkey has over $15 billion in business contracts with Moammar Kadafi's Libya and has built a close relationship with Syrian President Bashar Assad. Turkey's foreign policy of "zero problems" with neighbors is becoming harder to implement as peoples and governments in the neighborhood are increasingly on opposite sides.

Although Arab public opinion has held Turkey in very high esteem in past years, recent events have tarnished that image. This could have been Turkey's moment in the Middle East; the moment was lost.

Saudi Arabia has been taken aback by the loss of old allies and remains worried about increased Iranian influence, but has maintained its sphere of influence. Its military intervention in Bahrain shows that Riyadh is extremely worried not only about Iranian influence but about the wave of democratic change, and still has not figured out a way to achieve a balance between addressing growing demands by citizens for better governance and social justice, while keeping Iranian influence out of the Gulf Cooperation Council.

Although the United States has generally suffered setbacks from the events of the past months, it is adjusting quickly to the new realities and stands to remain a key player in the coming period. It has not lost its leverage despite the demise of its main Egyptian and Tunisian allies, and has expressed support for protests after realizing they were not dominated by radical groups and that they echoed Western values.

Emerging global powers such as Russia, China, India and Brazil have had mixed reactions to the "Arab Spring." All were reluctant to approve Western-led military intervention in Libya, expressing concerns ranging from the risk of higher oil prices to a potential spillover effect on their shores.

As for Israel, even though its peace treaty with Egypt will remain in place, it no longer has any friends in the region after the departure of Egyptian President Hosni Mubarak, its declining relations with Turkey and growing unrest in Jordan. The recent Fatah-Hamas accord underlines Israel's predicament. Two difficult challenges lie ahead: The Palestinian Authority's unilateral move to declare Palestinian statehood by the end of the year and a potential Palestinian popular uprising encouraged by the success of neighboring populations.

Although the Arab Spring has been largely about internal democracy and reform, it has affected all of the major regional and international actors. However, so far there has been no major shift in the balance of power or the basic pattern of regional relations.

#### No diversion---states that want nuclear weapons build civilian plants when they’ve already decided to build weapons

Matthew Fuhrmann 12, Assistant Professor of Political Science at Texas A&M University, Splitting Atoms: Why Do Countries Build Nuclear Power Plants?,” International Interactions, Vol. 38, No. 1

I suggested in the introduction of the article that nuclear energy development could lead to nuclear proliferation. It is plausible that the causal arrow goes in the other direction. Indeed, incentives to build nuclear weapons could motivate states to build nuclear power plants, a notion that is known in the literature on nuclear proliferation as nuclear hedging. Ariel Levite (2002/03, 69) defines nuclear hedging as the pursuit of “a viable option for the relatively rapid acquisition of nuclear weapons, based on an indigenous technical capacity to produce them within a relatively short time frame ranging from several weeks to a few years.” This idea has garnered significant scholarly attention in recent years. Trevor Findlay (2011, 27), for example, states that nuclear hedging may be a “critical, if unacknowledged, driver [of nuclear power development].” Alexander Montgomery and Scott Sagan (2009, 304) similarly argue that “some governments’ civilian nuclear-power programs reflect internal ambivalence about whether the state should pursue a bomb option,” implying that states create hedging options. The hedging argument is fashionable because it offers a potential answer to a puzzle that cannot be fully explained by neo-realist theories of nuclear proliferation: Why have many technologically capable countries refrained from building nuclear weapons? The answer, according to the theory of nuclear hedging, is that states in dangerous neighborhoods cautiously open up the possibility of building the bomb in the future without accepting the risks that come with a formal decision to proliferate.

The preceding discussion implies that countries should build nuclear power plants when they have an interest in developing nuclear weapons—but before they have formally made a political decision to proliferate. It is also possible that countries pursue civilian nuclear programs after they have nuclear weapons programs with the intent of augmenting the latter. This could happen for two main reasons. First, civilian nuclear facilities could provide a source of plutonium for bombs. There are a host of issues associated with using nuclear power plants directly for military purposes—such as the presence of International Atomic Energy Agency (IAEA) safeguards on most civilian facilities—but doing so is theoretically possible. Second, states that are already pursing nuclear weapons might develop a nuclear energy program to provide cover for their military activities.

A review of the historical record provides some evidence to support these mechanisms. Pakistan, for example, procured nuclear power reactors from Canada, in part, to have a source of plutonium for nuclear weapons (Kapur 1987). France may have developed or expanded its nuclear power programs partially for military purposes; plutonium from civilian sites was used to produce many of the bombs in the French nuclear arsenal (Donnay and Custer 1995, 462). Iran, South Korea, and Taiwan may also have built nuclear power plants at least partially to provide cover for their nuclear weapons programs.

### 1nc natural gas adv

#### Low natural gas prices determine the success of new biofuel ventures---the plan sends a key market signal that triggers a wave of ethanol investment

Jim Lane 12, Biofuels Digest, April 20, 2012, “Falling natural gas prices and the bio-based opportunity,” online: http://www.biofuelsdigest.com/bdigest/2012/04/20/falling-natural-gas-prices-and-the-bio-based-opportunity/

Think that falling natural gas prices mean bad news for bio-based technologies? Don’t bet on it. There’s opportunity in there.

On the chance that you were engaged in interstellar travel, or cryogenically frozen, over the past two years – US natural gas prices and global oil prices have completely decoupled, for the first time in living memory. For a long, long time, a barrel of oil cost just around 10 times the cost of a million BTUs of natural gas, or about 70 percent more on a BTU basis.

Today, a barrel of oil is available at 50 times the cost of a million BTUs of natural gas. In addition to oil prices rising, primarily as the result of Middle East tensions and rising demand from developing countries – there has been, in the US, a massive drop in natural gas prices owing to the impact of new technologies for liberating gas from shale.

For chemical plants that utilize natural gas as a feedstock, it means opportunity, and they have responded vigorously. Yesterday, Dow unveiled plans for a new, $1.7 billion, 1.5 million metric ton steam cracker in Freeport, Texas that will start producing ethylene in 2017, part of a $4 billion investment by the company in expanded US production in response to falling feedstock prices.

Only last month, Shell announced a strikingly similar, $2 billion project in Pennsylvania, while Chevron Phillips (a JV of ConocoPhillips and Chevron) is planning a project in Texas, Formosa Plastics has announced a $1.7 billion project for Texas, along with a liquid natural gas project announced by Freeport Development. LyondellBasell and Occidental are also looking at major projects along the Gulf Coast.

Falling feedstock prices?

That catalyst for economic activity should be a watched carefully by bio-based growers, whose technologies currently are scheduled to produce liquid fuels and chemicals at prices competitive with anywhere from $30 oil to $100 oil. Nothing is scheduled to compete with $20 oil, which is where oil prices were the last time natural gas was available for $2 per MMBTUs, back in 2002.

Many have described the divergence between natural gas and oil as a temporary phenomenon that will return to equilibrium because of a slowdown in development of gas projects. But high oil prices encourage more drilling, and natural gas is a by product of those projects, Fully 75 percent of the increase in US gas production this year is expected to be a consequence of increase oil drilling, according to Bloomberg Business Week.

The key takeaway from falling natural gas prices

Processing technology investments follow cheap feedstock, and transformational processing technology is a liberator of value by unlocking low-cost feedstocks that were previously untappable.

One of the reasons why technologies from the likes of Enerkem, Terrabon, INEOS Bio and Fulcrum, that utilize zero-cost municipal solid waste, remain highly prized, and may push the Enerkem and Fulcrum IPOs over the finishing line this spring.

Problem there is abundance of aggregated feedstock. Generally speaking, the projects contemplated by the developers range from 10-30 million gallons, and that is generally a function of the transportation cost for the feedstock, which generally must be brought in by truck, barge or rail.

For biofuels, it reminds that feedstock yield intensification is an absolute must for expansion – both in providing lower overall costs (while providing sufficient return to the grower), and in providing larger concentrations of biomass that will make larger projects more feasible. Larger projects have lower technology costs – and attract more attention from end-use fuels and chemical companies who, on the whole, have been generally underwhelmed by the scale of proposed biofuels operations.

Other potential winners in the bio-based space from high oil prices and falling gas prices?

Outside the North American market

From the EU to Asia, gas and oil prices remain largely in their traditional relationship. There, consumers should be expected to demand diversification away from oil as a strategy to limit price volatility and combat emissions.

Many first generation ethanol plants.

The more modern plants use natural gas – and a lot of of it, to provide the process heat for ethanol production. Lower natural gas input prices, lower ethanol prices. That simple.

LanzaTech

As the company says, “our patented, wholly-owned microbe that uses gas feeds as its sole source of carbon and energy for fuel and chemical production. Our microbe is feedstock agnostic and [can use] steam reformed methane that is rich in hydrogen.

Sundrop Fuels

In Colorado, Sundrop Fuels announced that they have agreed to purchase about 1,200 acres of land near Alexandria, Louisiana to build their first plant. Using forest waste and hydrogen from natural gas, their plant will produce up to 50 MGy of renewable gasoline. The plant will cost $450 to $500 million to build and will be financed in part through the sale of tax-exempt Private Activity Bonds.

The biofuels plant will salvage wood waste from renewable forests in Central Louisiana and adjacent regions and use that biomass as a feedstock. Sundrop Fuels also will extract hydrogen from abundant supplies of Louisiana natural gas, combining the hydrogen in a proprietary reactor with carbon extracted from wood waste. The result — up to 50 million gallons of fuel a year — will represent the world’s first renewable green gasoline that’s immediately adaptable to existing pumps, pipelines, engines and transportation infrastructure.

Siluria

Last October, we reported, “In California, Siluria has attracted $20 million for a technology platform to convert methane to chemicals, plastics, and fuels. Siluria’s Series B financing was led by the U.K. based Wellcome Trust, joining Siluria’s founding investors Alloy Ventures, ARCH Venture Partners, Kleiner Perkins Caufield & Byers, Altitude Life Science Ventures, Lux Capital, and Presidio Ventures in this Series B.”

Siluria’s technology? Researchers Erik Scher and Alex Tkachenko of Siluria Technologies in San Francisco stated that the metals coating the virus form a nanotube structure they refer to as a “hairball”, giving the catalyst a greater surface area, which enhances the reactions. This conversion happens at temperatures 200 to 300 below current steam cracking methods, greatly reducing the energy needed by current technology to produce ethylene. This attempt to commercialize a bio-technique of forming nanostructures is based on Dr. Angela Belcher’s work at M.I.T, where she leads the Biomolecular Materials Group. Her lab is currently researching a number of uses including biofuels and hydrogen production for fuel cells.”

Glori Energy

Glori Energy’s mission is to sustainably and efficiently recover oil trapped in reservoirs using existing oil wells through the deployment of its microbe-based Activated Environment for Recovery of Oil (AERO) System. AERO enhances production from waterflooded wells by stimulating a reservoir’s naturally occurring microbes to improve water sweep and oil mobility. Waterflood technology injects water into reservoirs to release additional quantities of oil that were unrecoverable during primary recovery. Conventional waterflooding only extracts a fraction of all discovered oil, leaving the majority underground. The AERO System provides a new, viable option to recover this trapped oil with minimal new footprint or investment.

The Bottom Line

Last month, we urged observers of the bio-based space to think beyond green, to think about the opportunities in the Olive Economy – where the new green meets the old brown. This week demonstrates that chemical producers, for one, will put their capital to work if they see real, transformational shifts in feedstock opportunities.

#### Large-scale ethanol production causes extinction

Tad Patzek 8, professor of Civil and Environmental Engineering at UC-Berkeley, 2008, “Can the Earth Deliver the Biomass-for-Fuel we Demand,” in Biofuels, Solar, and Wind as Renewable Energy Systems, ed. Pimentel, p. 36-44

Physics, chemistry and biology say clearly that there can be no sustained net mass output from any ecosystem for more than a few years. A young forest in a temperate climate grows fast in a clear-cut area, see Fig. 2.16, and transfers nutrients from soil to the young trees. The young trees grow very fast (there is a positive NPP). but the amount of mass accumulated in the forest is small. When a tree burns or dies some or most of its nutrients go back to the soil. When this tree is logged and hauled away, almost no nutrients are returned. After logging young trees a couple of times the forest soil becomes depleted, while the populations of insects and pathogens are well-established, and the forest productivity rapidly declines (Patzek and Pimemel. 2006). When the forest is allowed to grow long enough, its net ecosystem productivity becomes zero on the average.

Therefore, in order to export biomass (mostly water, but also carbon, oxygen, hydrogen and a plethora of nutrients) an ecosystem must import equivalent quantities of the chemical elements it lost, or decline irreversibly. Carbon comes from the atmospheric CO2 and water flows in as rain, rivers and irrigation from mined aquifers and lakes. The other nutrients, however, must be rapidly produced from ancient plant matter transformed into methane, coal, petroleum, phosphates.17 etc., as well as from earth minerals (muriate of potash, dolomites, etc.), - all irreversibly mined by humans. Therefore, to the extent that humans are no longer integrated with the ecosystems in which they live, they are doomed to extinction by exhausting all planetary stocks of minerals, soil and clean water. The question is not if, but how fast.

It seems that with the exponentially accelerating mining of global ecosystems for biomass, the time scale of our extinction is shrinking with each crop harvest. Compare this statement with the feverish proclamations of sustainable biomass and agrofuel production that flood us from the confused media outlets, peer-reviewed journals, and politicians.

2.5.3 Is There any Other Proof of NEP = 0?

I just gave you an abstract proof of no trash production in Earth's Kingdom, except for its dirty human slums.

Are there any other, more direct proofs, perhaps based on measurements? It turns out that there are two approaches that complement each other and lead to the same conclusions. The first approach is based on a top-down view of the Earth from a satellite and a mapping of the reflected infrared spectra into biomass growth. I will summarize this proof here. The second approach involves a direct counting of all crops, grass, and trees, and translating the weighed or otherwise measured biomass into net primary productivity of ecosystems. Both approaches yield very similar results.

2.5.4 Satellite Sensor-Based Estimates

Global ecosystem productivity can be estimated by combining remote sensing with a carbon cycle analysis. The US National Aeronautics and Space Administration (NASA) Earth Observing System (EOS) currently "produces a regular global estimate of gross primary productivity (GPP) and annual net primary productivity (NPP) of the entire terrestrial earth surface at 1-km spatial resolution, 150 million cells, each having GPP and NPP computed individually" (Running et al.. 2000). The MOD17A2/A3 User's Guide (Heinsch et al.. 2003) provides a description of the Gross and Net Primary Productivity estimation algorithms (MOD17A2/A3) designed for the MODIS1\* sensor.

The sample calculation results based on the MODI7A2/A3 algorithm are listed in Table 2.2. The NPPs for Asia Pacific. South America, and Europe, relative to North America, are shown in Fig. 2.17. The phenomenal net ecosystem productivity of Asia Pacific is 4.2 larger than that of North America. The South American ecosystems deliver 2.7 times more than their North American counterparts, and Europe just 0.85. It is no surprise then that the World Bank19, as well as agribusiness and logging companies - Archer Daniel Midlands (ADM). Bunge. Cargill. Monsanto. CFBC. Safbois. Sodefor. ITB. Trans-M. and many others - all have moved in force to plunder the most productive tropical regions of the world, see Fig. 2.18.

According 10 a MODIS-based calculation (Roberts and Wooster, 2007) of biomass burned in Africa in February and August 2004. prior to the fires shown here, the resulting carbon dioxide emissions were 120 and 160 million tonnes per month, respectively.

The final result of this global "end-game" of ecological destruction will be an unmitigated and lightcning-fast collapse of ecosystems protecting a large portion of" humanity.20

2.5.5 NPP in the US

The overall median values of net primary productivity may be converted to the higher heating value (HHV) of NPP in the US. see Fig. 2.19. In 2003. thus estimated net annual biomass production in the US was 5.3 Gt and its HHV was 90 EJ. One must be careful, however, because the underlying distributions of ecosystem productivity are different for each ecosystem and highly asymmetric. Therefore, lumping them together and using just one median value can lead to a substantial systematic error. For example, the lumped value of US NPP of 90 EJ. underestimates the overall 2003 estimate21 of 0.408 x 7444068 x 106 x 17 x 106 x 2.2 x 10"18 = 113EJ by some 20%.

To limit this error, one can perform a more detailed calculation based on the 16 classes of land cover listed in Table 2.2 in (Hum et al.. 2001). The MODIS-derived median NPPs are reported for most of these classes. The calculation inputs are shown in Table 2.3. Since the spatial set of land-cover classes cannot be easily mapped onto the administrative set of USDA classes of cropland, woodland, pastureland/rangeland. and forests. Hunt et al. (2001) provide an approximate linear mapping between these two sets, in the form of a 16x4 matrix of coefficients between 0 and 1.1 have lumped the land-cover classes somewhat differently (to be closer to USDA's classes), and the results are shown in Table 2.4 and Fig. 2.20.

The Cropland 4- Mosaic class here comprises die USDA's cropland, woodland, and some of the pasture classes. The Remote Vegetation class comprises some of the USDA's rangeland and pastureland classes. The USDA forest class is somewhat larger than here, as some of the smaller patches of forest, such as parks, etc.. are in the Mosaic class. Thus calculated 2003 US NPP is 118 EJ yr"1, 74 EJ yr"1 of above-ground (AG) plant construction and 44 EJ yr in root construction. In addition 12/74 = 17% of AG vegetation is in remote areas, not counting the remote forested areas. Note that my use of land-cover classes and their typical root-to-shoot ratios yields an overall result (118 EJ yr~') which is very similar to that derived by the Numerical Terradynamic Simulation Group {113 EJ yr-1).

Therefore, the DOE/USDA proposal to produce 130 billion gallons of ethanol from 1400 million tonnes of biomass (Perlack et a!., 2005) each year - and year-after-year-, would consume 32% of the remaining above-ground NPP in the US. see Fig. 2.20. if one assumes a 52% energy-efficiency of the conversion.~ At the current 26% overall efficiency of the corn-ethanol cycle (Patzek, 2006a), roughly 64% of all AG NPP in the US would have to be consumed to achieve this goal with zero harvest losses.23 To use more than half of all accessible above-ground plant growth in all forests, rangeland. pastureland and agriculture in the US to produce agrofuels would be a continental-scale ecologic and economic disaster of biblical proportions.24

2.6 Conclusions

I have shown that the Earth simply cannot produce the vast quantities of biomass we want to use to prolong our unsustainable lifestyles, while slowly committing suicide as a global human civilization.

In passing- I have noted that the "cellulosic biomass" refineries are very inefficient, currently impossible to scale, and incapable of ever catching up with the runaway need to feed one billion gasoline- and diesel-powered cars and trucks.

[NPP is net primary productivity – biomass produced by the earth annually]

#### Their author concedes no impact

Green and Schrage 9 - Green, CSIS Senior Advisor, and Schrage, CSIS International Business Chair, 9 – Michael J. Green, Senior Advisor and Japan Chair at the Center for Strategic And International Studies, and Steven P. Schrage, SCIS Scholl Chair in International Business and former official with the US Trade Representative’s Office,

These danger signs do not mean that the worst case scenarios are likely to happen even if the economic crisis extends beyond 2009, but history and contemporary trends both suggest that they could happen if we are not careful. Fortunately, we can learn from past failings.

We know that it is important to fight protectionism, and the US and its key allies can lead in that effort at home and through the WTO, APEC [Asia-Pacific Economic Cooperation grouping of nations], the Group of Seven [leading industrialized nations] and [the broader] the G-20, or through other new or strengthened alliances that might be built between committed partners.

We know that offensive trade liberalization through renewed efforts at the WTO or with the South Korea-US Free Trade Agreement would be the best defense of all against protectionism. We know that it is important to provide economic assistance to fragile states like Pakistan and through the World Bank and International Monetary Fund even amidst our own financial crises.

We know that it would be foolhardy to slash defense spending or to replace deterrence and strong alliances with weak diplomatic arrangements as we did in the 1920s and 1930s. And we know that we need a global strategy for revitalizing economic growth and recognizing its interconnections to security rather than seeking relative gains through unilateral approaches.

#### Econ decline doesn’t cause war

Barnett 9**—**senior managing director of Enterra Solutions LLC (Thomas, The New Rules: Security Remains Stable Amid Financial Crisis, 25 August 2009, http://www.aprodex.com/the-new-rules--security-remains-stable-amid-financial-crisis-398-bl.aspx)

When the global financial crisis struck roughly a year ago, the blogosphere was ablaze with all sorts of scary predictions of, and commentary regarding, ensuing conflict and wars -- a rerun of the Great Depression leading to world war, as it were. Now, as global economic news brightens and recovery -- surprisingly led by China and emerging markets -- is the talk of the day, it's interesting to look back over the past year and realize how globalization's first truly worldwide **recession has had** virtually **no impact** whatsoever **on** the **international security** landscape. None of the more than three-dozen ongoing conflicts listed by GlobalSecurity.org can be clearly attributed to the global recession. Indeed, the last new entry (civil conflict between Hamas and Fatah in the Palestine) predates the economic crisis by a year, and three quarters of the chronic struggles began in the last century. Ditto for the 15 low-intensity conflicts listed by Wikipedia (where the latest entry is the Mexican "drug war" begun in 2006). Certainly, the Russia-Georgia conflict last August was specifically timed, but by most accounts the opening ceremony of the Beijing Olympics was the most important external trigger (followed by the U.S. presidential campaign) for that sudden spike in an almost two-decade long struggle between Georgia and its two breakaway regions. Looking over the various databases, then, we see a most familiar picture: the usual mix of civil conflicts, insurgencies, and liberation-themed terrorist movements. Besides the recent Russia-Georgia dust-up, the only two potential state-on-state wars (North v. South Korea, Israel v. Iran) are both tied to one side acquiring a nuclear weapon capacity -- a process wholly **unrelated to** global **economic trends**. And with the United States effectively tied down by its two ongoing major interventions (Iraq and Afghanistan-bleeding-into-Pakistan), our involvement elsewhere around the planet has been quite modest, both leading up to and following the onset of the economic crisis: e.g., the usual counter-drug efforts in Latin America, the usual military exercises with allies across Asia, mixing it up with pirates off Somalia's coast). Everywhere else we find serious instability we pretty much let it burn, occasionally pressing the Chinese -- unsuccessfully -- to do something. Our new Africa Command, for example, hasn't led us to anything beyond advising and training local forces. So, to sum up: •No significant uptick in mass violence or unrest (remember the smattering of urban riots last year in places like Greece, Moldova and Latvia?); •The usual frequency maintained in civil conflicts (in all the usual places); •Not a single state-on-state war directly caused (and no great-power-on-great-power crises even triggered); •No great improvement or disruption in great-power cooperation regarding the emergence of new nuclear powers (despite all that diplomacy); •A modest scaling back of international policing efforts by the system's acknowledged Leviathan power (inevitable given the strain); and •No serious efforts by any rising great power to challenge that Leviathan or supplant its role. (The worst things we can cite are Moscow's occasional deployments of strategic assets to the Western hemisphere and its weak efforts to outbid the United States on basing rights in Kyrgyzstan; but the best include China and India stepping up their aid and investments in Afghanistan and Iraq.) Sure, we've finally seen global defense spending surpass the previous world record set in the late 1980s, but even that's likely to wane given the stress on public budgets created by all this unprecedented "stimulus" spending. If anything, the friendly cooperation on such stimulus packaging was the most notable great-power dynamic caused by the crisis. Can we say that the world has suffered a distinct shift to political radicalism as a result of the economic crisis? Indeed, no. The world's major economies remain governed by center-left or center-right political factions that remain decidedly friendly to both markets and trade. In the short run, there were attempts across the board to insulate economies from immediate damage (in effect, as much protectionism as allowed under current trade rules), but there was no great slide into "trade wars." Instead, the World Trade Organization is functioning as it was designed to function, and regional efforts toward free-trade agreements have not slowed. Can we say Islamic radicalism was inflamed by the economic crisis? If it was, that shift was clearly overwhelmed by the Islamic world's growing disenchantment with the brutality displayed by violent extremist groups such as al-Qaida. And looking forward, austere economic times are just as likely to breed connecting evangelicalism as disconnecting fundamentalism. At the end of the day, the economic crisis did not prove to be sufficiently frightening to provoke major economies into establishing global regulatory schemes, even as it has sparked a spirited -- and much needed, as I argued last week -- discussion of the continuing viability of the U.S. dollar as the world's primary reserve currency. Naturally, plenty of experts and pundits have attached great significance to this debate, seeing in it the beginning of "economic warfare" and the like between "fading" America and "rising" China. And yet, in a world of globally integrated production chains and interconnected financial markets, such "diverging interests" hardly constitute signposts for wars up ahead. Frankly, I don't welcome a world in which America's fiscal profligacy goes undisciplined, so bring it on -- please! Add it all up and it's fair to say that this global financial crisis has proven the great resilience of America's post-World War II international liberal trade order.

#### Decline doesn’t embolden adversaries

Kapila 10 [Dr. Subhash Kapila is an International Relations and Strategic Affairs analyst and the Consultant for Strategic Affairs with South Asia Analysis Group and a graduate of the Royal British Army Staff College with a Masters in Defence Science and a PhD in Strategic Studies., “21st Century: Strategically A Second American Century With Caveats,” June 26, http://www.eurasiareview.com/201006263919/21st-century-strategically-a-second-american-century-with-caveats.html]

Strategically, the 20th Century was decidedly an American Century. United States strategic, military, political and economic predominance was global and undisputed. In the bi-polar global power structure comprising the United States and the Former Soviet Union it was the United States which globally prevailed. The 20th Century's dawn was marked by the First World War which marked the decline of the old European colonial powers, noticeably Great Britain. The Second World War marked the total eclipse of Great Britain and other colonial powers. The United States replaced Great Britain as the new global superpower. The 20th Century's end witnessed the end of the Cold War, with the disintegration of the Former Soviet Union as the United States strategic challenger and counter-vailing power. On the verge of the new millennium the United States strode the globe like a colossus as the sole global super power. With a decade of the 21st Century having gone past, many strategic and political analysts the world over have toyed with projections that United States global predominance is on the decline, and that the 21st Century will not be a second American Century. Having toyed, with such projections, these analysts however shy away from predicting whose century the 21st Century will strategically be? The trouble with such projections is that they are based predominantly on analyses of economic trends and financial strengths and less on detailed analyses of strategic and military strengths, and more significantly strategic cultures. Presumably, it is easier for such analysts to base trends on much quoted statistical data. Strategic analysis of global predominance trends is a more complex task in the opinion of the Author, as it cannot be based on statistical data analysis. Global predominance trends need unravelling of strategic cultures of contending powers, the reading of national intentions and resolve and the inherent national strengths and willpower demonstrated over a considerable time span of half-centuries and centuries. Crisply put, one needs to remember that in the 1980's, Japan and Germany as "economic superpowers" could not emerge as global superpowers. Hence global predominance calls for more than economic strengths. The United States getting strategically bogged down in Iraq and Afghanistan in the first decade of the 21st Century has not led to any noticeable decline in American global predominance. Despite Iraq and Afghanistan, the United States reigns supreme globally even in East Asia where China could have logically challenged it. More significantly, and normally forgotten, is the fact that the off-quoted shift of global and economic power from the West to East was facilitated by United States massive financial direct investments in China, Japan, South Korea and India. China quoted as the next superpower to rival the United States would be economically prostate, should the United States surgically disconnect China's economic and financial linkages to the United States. More significantly, while examining the prospects of the 21st Century as a "Second American Century" it must be remembered that besides other factors, that out of the six multipolar contenders for global power, none except China have shown any indications to whittle down US global predominance. Even China seems to be comfortable with US power as long as it keeps Japan in check. This Paper makes bold to assert that the 21st Century would be a Second American Century despite China's challenge and the strategic distractions arising from the global Islamic flash-points.

# 2NC

## DD&E CP

### Turns the Case---2NC

#### Rushing the safety process destroys SMRs’ prolif-resistance

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

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

#### Explicitly ensuring safety’s key to public trust

Dr. Edwin Lyman 11, Senior Scientist, Global Security Program, Union of Concerned Scientists, July 14, 2011, Testimony Before the Energy and Water Development Subcommittee, Committee on Appropriations, U.S. Senate, “An Examination of the Safety and Economics of Light Water Small Modular Reactors”

The Union of Concerned Scientists is neither pro nor anti-nuclear power, but has served as a nuclear power safety and security watchdog for over 40 years. UCS is also deeply concerned about global climate change and has not ruled out an expansion of nuclear power as an option to help reduce greenhouse gas emissions—provided that it is affordable relative to other low-carbon options and that it meets very high standards of safety and security. However, the Fukushima Daiichi crisis has revealed significant vulnerabilities in nuclear safety and has shaken public confidence in nuclear power. If we want to reduce the risk of another Fukushima in the future, new nuclear plants will have to be substantially safer than the current generation. To this end, we believe that the nuclear industry and the Energy Department should work together to focus on developing safer nuclear plant designs, and that Congress should direct the Energy Department to spend taxpayer money only on support of technologies that have the potential to provide significantly greater levels of safety and security than currently operating reactors. The nuclear industry will have to work hard to regain the public trust.

#### Public trust determines the extent of SMR adoption

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

One additional obstacle is beyond the scope of this report but could play a significant role in whether SMRs are commercially deployed: public opinion. To the extent that the smaller profile of SMRs results in their deployment closer to population centers, public opposition to their deployment might rise. Deployment at existing sites, or in industrial applications away from residential areas, however, might minimize the impact of public opinion. Education about the safety features of SMRs and nuclear reactors in general could also ameliorate this concern.

### Backlash Internal Link---2NC

#### Fukushima puts global nuclear safety on the brink—another accident shuts down civilian use

Stewart Brand, CNN, 3/24/11, What's next for nuclear power?, features.blogs.fortune.cnn.com/2011/03/24/whats-next-for-nuclear-power/

My thoughts are only partially complete. I'm paying close attention. One thing we know is that a 9.0 earthquake did not harm the nuclear reactors in Japan. What did get them was the tsunami that was just a bit higher than what they had prepared for. I'm impressed that so far they've not had really significant releases of radioactive stuff. And I'm really impressed with the reporting on the crisis. When you compare how the media have handled this calamity with what happened in '86 at Chernobyl and before that at Three Mile Island, there's a lot less panic and a lot more detailed, knowledgeable public instruction going on. I think that is very good news, particularly because people in the U.S. and parts of Europe are starting to change their minds about nuclear. Before, it was, "Should we just shut these damn things down?" Now, I think, it's more in the mode of, "Should we go ahead with a nuclear renaissance, and if so, what kind of details need to be focused on?" In Fukushima, we're looking at a 40-year-old boiling-water reactor whose cooling capability, it turns out, was not as redundant as it needed to be. Newer reactor designs, like the Westinghouse AP1000, have passive cooling systems. They don't need extra power; nobody has to do anything. We should learn from Japan. What new training do we want to provide for plant operators? What new equipment and systems have to be installed? What new requirements should the NRC enforce? If the discussion is technical rather than theological, I think nuclear will go forward. With its fast-growing thirst for electricity, China, which has 25 nuclear power plants under construction including the Sanmen reactor in Zhejiang Province, remains committed to nuclear. We've already come a long way. There have been no more Three Mile Islands because the industry paid close attention to what happened there. For the same reason, there will be no more Fukushimas. But, you know, probably in China or India or somewhere, there'll be some other nuclear event, and it will be a big, serious problem that everybody will look at with either horror or close attention or both. Basically, high concentrations of energy -- whether it's in gasoline or natural gas going through pipes underneath your neighborhood -- are dangerous stuff. Nuclear is more in Black Swan territory, where you have infrequent but big events. Other sources of energy fall into the routine-death domain, both for civilians and workers, so you're always seeing cost-benefit analyses. The sad thing for me is that in the U.S. we're more concerned about these damn nuclear plants than about what happened in Japan with this absolutely horrifying tsunami and earthquake. I think that nuclear is a significant part of their problems, but it is far from the worst problem. My perspective is mainly global. What the U.S. does or doesn't do in the wake of Japan is important but not the main event. The main event is in the developing world, where billions of people are getting out of poverty and moving to cities, and they want electricity. They're either going to get that electricity from coal or they're going to get it from nuclear. My personal preference for the atmosphere is that it not be coal. So I was glad to read that even after what's happened in Japan, China and India remain committed to nuclear power. We used to think, Well, one more major nuclear accident and that's it for the nuclear industry. Everybody said that. Now we've had one more major nuclear accident, and from what I can see so far, to our surprise, that's not it for the nuclear industry. It looks as if this will be seen as a cautionary story. Meanwhile the big calamity -- the earthquake-and tsunami-scale calamity that is climate change -- is still overshadowing everybody and everything.

### Solvency---2NC

#### The counterplan solves the entire case---starting with detailed design and engineering speeds SMR development and causes the NRC to license reactors---spills over to widespread commercialization

Robert Rosner 11, the William E. Wrather Distinguished Service Professor in the departments of Astronomy & Astrophysics and Physics at the University of Chicago; and Stephen Goldberg, Special Assistant to the Director at Argonne National Laboratory, November 2011, “Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.,” <http://epic.uchicago.edu/sites/epic.uchicago.edu/files/uploads/SMRWhite_Paper_Dec.14.2011copy.pdf>

The study team learned during the study, which included comments received from the utilities and vendors who participated in the DOE Nuclear Power 2010 (NP-2010) program, that further delineation of the design and engineering for large (GW-scale) reactors would have likely resulted in firmer overnight cost quotes and, potentially, more expedited licensing approvals. This lesson – if learned – argues strongly that a key initial step for a robust SMR reprogram is to support the completion of detailed design and engineering (DD&E) work that is more expansive than the FOAKE effort. The scope of such a DD&E effort would include the preparation of construction drawings; the specification of system components; procurement engineering, including the preparation of bid packages for suppliers; a general site layout (that would then be adapted to individual plants); and all nonrecurring design and engineering work at the manufacturing site. These DD&E activities for the SMR program may have to be more expansive than the scope for the NP2010 FOAKE program. More robust engineering design work could facilitate the NRC design certification (DC) process, and additional design and engineering activity will be needed to integrate the design of SMR modules with site and manufacturing facility specifications. A more robust DD&E process also may reduce the tendency to “pancake” contingencies, so that fixed/firm cost estimates are established and, more importantly, supporting follow-on manufacturing and construction activities for SMRs are carried out.

Estimates of DD&E costs for SMRs are being closely held by the vendors for obvious reasons having to do with business competitiveness. Based on general discussions with the vendors, the study team estimates that the total DD&E cost for each SMR technology is approximately $1.0 billion. This amount includes the cost for bringing the design to the point where it can satisfy NRC requirements (either under the Code of Federal Regulations, Part 50 or Part 52), support firm/fixed-cost estimates for construction of the initial SMR plant (which designate as the “LEAD” plant), and provide design and cost estimates for the construction of an SMR module manufacturing facility. The DD&E estimate is somewhat more conservative than the experience with Gen III+ reactors, which the study team estimates at about $800 million for the licensing/DC/FOAKE activities. This conservatism reflects the additional work needed to integrate the SMR design with the design of the manufacturing facility, as well as a judgment as to the need for and benefits of a more robust upfront design effort. Planned follow-on research will ascertain the key cost drivers and trade-offs that determine these DD&E estimates.

[“FOAKE” = First-of-a-kind engineering]

#### Only the CP alone causes effective, high-quality SMRs---demonstrating the design before licensing is key to industry confidence and effective tech

Daniel Ingersoll 9, senior program manager in Oak Ridge National Laboratory's Reactors and Nuclear Systems Division, 2009, “Deliberately small reactors and the second nuclear era,” Progress in Nuclear Energy, Vol. 51, 589–603

First and foremost, new SMR designs will only be viable if they are matured to the point of credible engineering, including the balance of plant. For electricity generation, the current ﬂeet of large LWRs have set a high performance standard. Even for applications that cannot be addressed effectively by large plants, the market will demand safe, reliable, and cost effective plants. Most of the 60þ SMR designs that are being developed worldwide have been studied sufﬁciently well to validate their physics viability, but only a small subset have been engineered to the point that the promoted beneﬁts of the system are reasonably assured. It is vital that we not replicate a key failing of the ﬁrst nuclear era: the push of rapidly evolving technologies into the market place without adequate demonstration.

Assuming that credible engineering is achieved, it is further necessary to conﬁdently demonstrate the unique plant features that result from making the reactor deliberately small. As discussed in a previous section, the signiﬁcant economy of scale factor for nuclear plants will challenge the economic viability of SMRs unless innovative designs features result in a substantial cost savings. These innovations, such as integral primary systems and passive safety systems, will require thorough testing and demonstration through separate effects tests, scaled simulators, or perhaps even prototype units.

#### Only the CP causes an efficient licensing process---starting licensing before DD&E is complete causes backsliding, project delays, and crushes certainty---this is a disad to the permutation

Robert Rosner 11, the William E. Wrather Distinguished Service Professor in the departments of Astronomy & Astrophysics and Physics at the University of Chicago; and Stephen Goldberg, Special Assistant to the Director at Argonne National Laboratory, November 2011, “Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.,” <http://epic.uchicago.edu/sites/epic.uchicago.edu/files/uploads/SMRWhite_Paper_Dec.14.2011copy.pdf>

The current state of the licensing framework for SMRs is less mature than that in place for GW-LWRs at the time of initiation of the NP2010 program. At that time, the NRC licensing process was fully developed on paper, and the objective of the program was to demonstrate the process through the development of lead COL applications. As a consequence, there remain considerable uncertainties regarding the economic impact of the licensing process, especially in regard to the next three points.

Additional licensing issues may arise as SMR design and license applications are further developed. Although the ANS, NEI, and NRC efforts have developed systematic inventories of SMR licensing issues, SMR engineering design efforts are at a very early stage, and new issues may arise. The precise level of engineering design is “business proprietary.” Based on informal discussions with SMR industry representatives, the study team believes that current SMR designs are very preliminary in their evolution (i.e., less than 20% complete). By comparison, engineering design for GW-scale Gen III+ reactors was estimated to be about 30% complete at the time of submission of design certification applications to the NRC. Even at this level, NP2010 participants advised the study team that the review process for NRC design certification would have been more efficient if additional engineering had been completed prior to submission of DC applications to the NRC.

#### No solvency deficits---the NRC is working as fast as it can to develop a licensing framework---there’s only a risk that the plan messes up the process

Robert Rosner 11, the William E. Wrather Distinguished Service Professor in the departments of Astronomy & Astrophysics and Physics at the University of Chicago; and Stephen Goldberg, Special Assistant to the Director at Argonne National Laboratory, November 2011, “Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.,” <http://epic.uchicago.edu/sites/epic.uchicago.edu/files/uploads/SMRWhite_Paper_Dec.14.2011copy.pdf>

Cost estimate targets announced by SMR vendors are based on several important assumptions regarding the regulatory framework that will be used by the NRC to approve SMR designs and licenses. Consequently, the vendor technical and cost assumptions are subject to uncertainty and could change based on the outcome of the NRC process. A significant amount of effort is underway to resolve SMR licensing issues. The NRC staff, the American Nuclear Society (ANS), the Nuclear Energy Institute (NEI), and others have been analyzing the current licensing structure for GW-LWRs (i.e., DC, ESP, and COL) to identify issues and alternatives for adapting this licensing framework to SMRs. The previous work by the NRC staff on the Next Generation Nuclear Plant (NGNP) and other Generation-IV (Gen-IV) initiatives is serving as a forerunner for SMR licensing discussions.

### AT: Do Both---2NC

#### At best, the perm results in multiple reactor designs being constructed simultaneously. That independently collapses the industry---proliferation of designs makes scaling up production impossible---turns the whole case

Daniel Ingersoll 9, senior program manager in Oak Ridge National Laboratory's Reactors and Nuclear Systems Division, 2009, “Deliberately small reactors and the second nuclear era,” Progress in Nuclear Energy, Vol. 51, 589–603

In addition to the technical hurdles just described, a number of non-technical challenges also exist for the deployment of new SMR designs. First, there are too many competing designs. The number of options creates confusion in the market and dilutes the limited ﬁnancial and human resources available in the nuclear community. Again, we must learn from mistakes of the ﬁrst nuclear era and focus our attention on the few most promising designs with an eye toward standardization.

### Net-Benefit---2NC

#### Exports---reducing safety and security requirements means the U.S. will export unsafe reactors worldwide---particularly dangerous because they’d be sold places with no nuclear operation experience

Dr. Edwin Lyman 11, Senior Scientist, Global Security Program, Union of Concerned Scientists, July 14, 2011, Testimony Before the Energy and Water Development Subcommittee, Committee on Appropriations, U.S. Senate, “An Examination of the Safety and Economics of Light Water Small Modular Reactors”

UCS is also concerned that reducing safety and security requirements for SMRs could facilitate their sale to utilities or other entities in the United States and abroad that do not have prior experience with nuclear power. Some SMR vendors argue that their technology is so safe that it can be deployed to remote areas, military bases, and countries in the developing world that have relatively low electric demand and no nuclear experience or emergency planning infrastructure. However, SMRs deployed in this manner could raise additional safety and security concerns compared to their deployment by established and experienced nuclear utilities.

#### They’ll say SMRs are inherently safe---that’s not true yet---rushing exports of unsafe designs causes accidents globally

Dr. Edwin Lyman 11, Senior Scientist, Global Security Program, Union of Concerned Scientists, July 14, 2011, Testimony Before the Energy and Water Development Subcommittee, Committee on Appropriations, U.S. Senate, “An Examination of the Safety and Economics of Light Water Small Modular Reactors”

UCS believes that SMRs are only suitable for deployment where there is an established infrastructure to cope with emergencies, and if sufficient numbers of trained operator and security staff can be provided. It is unrealistic to assume the near-term availability of SMRs that are so safe they can be shipped around the world without the need to ensure the highest levels of competence and integrity of local regulatory authorities, plant operators, emergency planning organizations and security forces. Fukushima has demonstrated the importance of timely off-site response in the event of a severe accident, so the accessibility of reactors in remote locations also must be a prime consideration. Even within the U.S., small utilities with little or no experience in operating nuclear plants need to fully appreciate the unique challenges and responsibilities associated with nuclear power and should not expect that small modular reactors will provide any relief in this regard.

## Warming DA (on prolif)

### Warming DA---Link---2NC

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

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

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

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

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

Risks of Major Expansion

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

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

#### b) Solving warming requires quadrupling current reactor capacity---that’s Squassoni---that requires 4,000 reactors globally by mid-century

Nader Elhefnawy 8, Professor of English at the University of Miami, writer on IR published in journals including International Security, Astropolitics, and Survival, Autumn 2008, “The Next Wave of Nuclear Proliferation,” Parameters: The US Army War College Quarterly

For nuclear energy to simply keep its position in the world’s energy portfolio, production equivalent to 800 of today’s reactors would be needed. The very reason, however, for much of the interest in nuclear energy is concern about the scarcity of fossil fuels, particularly oil, so it can be expected that nuclear energy will be called on to play a greater role than it has to date—at the very least, generating a larger share of the electricity the world uses. France currently gets 77 percent of its electricity through this medium. Were the entire world to follow a similar path, it would mean more than a quadrupling of output, with more than 2,000 reactors required to meet current needs, and between 3,000 and 4,000 reactors plausibly online by 2050. Were nuclear energy to become more important in areas where it has previously been marginalized, such as transportation—for instance, by powering fleets of electric vehicles or large-scale hydrogen fuel production—then the demand could rise even beyond current expectations, with one observer estimating that simply to compensate for an absence in fossil fuel production (rather than absolute decreases), some 5,000 to 6,000 reactors would be required by mid-century.5

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

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

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

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

#### d) Solving warming requires almost 100 reactors a year---and requires several new states get enrichment capabilities

Sharon **Squassoni 8**, senior associate in the Nonproliferation Program at the Carnegie Endowment, former director of Policy Coordination in the Nonproliferation Bureau of the State Department, March 12, 2008, “Nuclear Energy and Global Warming,” Testimony before the Committee on House Select Energy Independence and Global Warming, lexis

A rough approximation of where reactor capacity would expand **in a climate change scenario** is based on the high scenario of the 2003 MIT Study, "The Future of Nuclear Power." For 1500 GW capacity, MIT estimated that 54 countries (an additional 23) would have commercial nuclear power programs. This essentially **means a five- fold increase in the numbers of reactors worldwide** and an annual build rate of 35 per year. In the event that smaller-sized reactors are deployed in developing countries - which makes eminent sense - the numbers could be much higher. If nuclear energy were assumed to be able to **contribute a reduction of** between 2 and **6 billion tons of carbon per year** as outlined in the Stern Report, the resulting reactor capacity would range between 1800 GWe and 4500 GWe - increases ranging from six times to ten times current capacity. This would require building between 42 and 107 reactors per year through 2050.

Impact on Uranium Enrichment

Such increases in reactor capacity would certainly have repercussions for the front and back ends of the fuel cycle. Almost 90 percent of current operating reactors use low-enriched uranium (LEU). Presently, 11 countries have commercial uranium enrichment capacity and produce between 40 and 50 million SWU. A capacity of 1070 GWe - the one "wedge" scenario - could mean tripling enrichment capacity, requiring anywhere from 11 to 22 additional enrichment plants. A capacity of 1500 GWe would require quadrupling enrichment capacity (see slide 4). Further, if Stern Report nuclear expansion levels are achieved, enrichment capacity would have to increase ten-fold.

In assessing where new uranium enrichment capacity might develop, the MIT Study assumed that 18 states would have 10 GWe reactor capacity - the point at which domestic uranium enrichment becomes competitive with LEU sold on the international market - and thus might enrich uranium. (See slide 4 for a more modest approach, with 9 additional countries enriching uranium).

### Warming DA---Enrichment Key to Solve Warming---2NC

#### Major expansion of nuclear’s global generating capacity requires enrichment facilities distributed world-wide---confining enrichment to a few supplier states is insufficient

OECD-NEA 9 – Organization for Economic Cooperation and Development, Nuclear Energy Agency, December 2009, “Nuclear Energy and Addressing Climate Change,” <http://www.oecd-nea.org/press/in-perspective/addressing-climate-change.pdf>

As noted above, a major expansion of nuclear power would require a commensurate increase in nuclear fuel cycle capacities. Nuclear power has a relatively complex fuel cycle, involving uranium mining and several industrial processes to prepare the finished fuel assemblies, which, for most reactor types, consist of pellets of enriched uranium dioxide encased in a lattice of metallic tubes. However, the expansion of uranium production, which depends on the availability of known, economically viable uranium resources, and uranium enrichment, which requires sensitive technology, present the main challenges.

Throughout the 1990s and until 2003, prices for uranium were low due to lower-than-expected nuclear expansion, and the fact that large stocks of previously mined uranium held by utilities and governments, including former military stocks released through nuclear disarmament after the Cold War ended, were released onto the market. As a result, uranium production is only about two-thirds of annual consumption. This production is, however, expected to increase over the next few years.

Uranium exploration since the 1980s has also been limited, although it has risen more than three-fold since 2002 in response to higher uranium prices. Despite limited recent exploration, the ratio of known uranium resources to present consumption is comparable to other mineral energy resources, at about 100 years. Additional resources that are expected to be discovered, on the basis of existing geological information, could expand the resources-to-consumption ratio to around 300 years. If known, "unconventional" resources are included, notably uranium contained in phosphate rocks, the ratio grows to about 700 years (see Table 1). If significant nuclear power expansion were to begin, a sustained increase in uranium exploration could be expected, and that could mean the discovery of many more sources of uranium.

A greater challenge could be the time taken to expand uranium production capacity due to the large investments needed and the lengthy approvals process for new mines in several major producing countries. This again indicates the importance of government support for the expansion of nuclear capacity.

The expansion of uranium-enrichment capacity, which is needed to prepare fuel for most reactors now on line and all of the more advanced designs, would also need to keep pace with nuclear expansion. Enrichment technology is, however, highly sensitive and only a handful of countries possess it. In principle, these countries could expand their capacities to supply other countries, which would present few technical difficulties. However, some countries are concerned about the security-of-supply implications of allowing a few countries to control all enrichment facilities. Proposals to alleviate these concerns range from legally binding assurances of supply by the enriching countries to establishing new enrichment facilities under multilateral control. Strengthening policy measures to control sensitive nuclear technologies while assuring supply would help nuclear power achieve its full potential.

Nuclear fuel also offers possibilities for recycling, since only a small fraction of the energy in the uranium is consumed in the reactor. This could vastly increase the energy potential of existing uranium stocks and known resources from a few hundred to several thousand years of nuclear fuel demand. It could also greatly reduce the radiotoxicity of the resulting high-level waste. Current recycling techniques use sensitive technologies and are unlikely to expand significantly in the short to medium term. However, developing advanced recycling and reactor technologies could allow better use of uranium and plutonium resources and increase the availability of nuclear fuel over the long term. As with enrichment, measures to control sensitive nuclear technologies while ensuring adequate access to the necessary fuel-cycle capacities may also be needed.

## AT: China add-on

### No Rise

#### Governance issues block China’s rise

Fullilove ’12 – director of the global issues program at the Lowy Institute for International Policy in Sydney, Australia, and a nonresident senior fellow in foreign policy at The Brookings Institution (Michael, “China's Biggest Challenge Isn't Military or Economic, It's Basic Governance,” May 8, http://www.theatlantic.com/international/archive/2012/05/chinas-biggest-challenge-isnt-military-or-economic-its-basic-governance/256867/)

For at least a decade, think tanks and government offices have echoed with tales of China's rise.

The narrative is familiar. China has remade its economy and is now eating America's lunch. The country is growing rapidly, laying roads and high-speed rail at a frenetic pace. The Chinese authorities sit atop a hoard of foreign exchange reserves that symbolize the country's new financial clout.

Increasingly, China's economic strength is mirrored in its military capability. It is, according to its boosters, destined for hegemony in the Asia-Pacific. Soon, they say, it may even be a peer-competitor of the United States.

China's recent performance has certainly been impressive. Yet recent official conduct in China, by turns baroque and brutal, should give observers pause for thought.

We now know that Bo Xilai, former Communist Party secretary of mega-city Chongqing and a rising star in the party, systematically terrorised and rorted his municipality. Bo and his wife allegedly sent hundreds of millions of dollars out of the country; she is the prime suspect in the murder of a British businessman; he is said to have plotted to kill his own police chief. Abuse of power was practised throughout their extended family, of which Bo Xilai was merely the capo di tutti capi.

Bo Xilai's behavior may have been more extreme than that of most senior officials. But corruption is widely entrenched throughout the country. There are Bo Xilais in other cities and provinces, too. This has deleterious consequences for government revenues, business efficiency, and social harmony -- all important elements of national power.

Nor is corruption limited to the civil authorities. Recent reporting by Australian journalist John Garnaut reveals that the People's Liberation Army (PLA) is riddled with it. The practice of buying promotions is common. Garnaut's sources describe a "web of military cliques, factions, and internal knots of organised crime" that "sounds more like the workings of warlord armies before the communist revolution than the rapidly modernising force that is currently rattling China's neighbours."

The implications of this corruption for the PLA's discipline and morale are serious, and raise sharp questions about its effectiveness as a war-fighting machine.

The Bo Xilai case has also shone a light on the effectiveness -- or lack thereof -- of China's leadership. In recent times, some Western analysts who wished for a more orderly politics than that found in their own capitals have glimpsed it in Beijing.

China has moved adroitly to protect its environment, reduce pollution, and invest in renewable energy, they note, in contrast to the policy paralysis in Washington. They even praise the long-termism of China's Five Year Plans compared to the short-termism of Western politics.

China's senior leaders, some observers conclude, are freer than Western politicians to pursue their country's national interest and maximise its national power.

There is some truth to this. But the larger truth, exposed by Bo Xilai, is that politics in China are still a vicious and occasionally deadly game. Paranoia and intrigue stalk the leadership. Even the president of China, Hu Jintao, is spied on by his rivals.

The milieu within Zhongnanhai, the Chinese leadership compound, is probably less like the collective of brilliant technocrats its admirers imagine and more like The Hunger Games. This is not a promising environment for steady and far-sighted leadership.

The case of the blind lawyer and activist Chen Guangcheng is, in many ways, just as telling as that of Bo Xilai.

Chen's mistreatment by local authorities, who were infuriated at his campaigns against forced abortions and sterilizations, reveals the feebleness of China's rule of law, the tensions between the center of power and the periphery, and the discrimination and abuses that can be a part of Chinese life. His escape from house arrest and its unfolding consequences demonstrate that, despite Beijing's wishes, these blemishes are not purely an internal matter.

China's mixed human rights record is not just bad for its citizens. It is a strategic weakness that complicates its foreign relations and diminishes its soft power. The state's harsh treatment of individuals and minorities regularly disrupts its bilateral relationships. Evidence of internal repression disillusions China's friends and increases the wariness of its neighbors. The human rights issue is a pebble in China's shoe, and the country may never hit its full stride unless it is removed.

China is clearly a global player, and it will remain so. The country is finally achieving an economic position befitting its huge size. That is good news for the hundreds of millions of Chinese people who have been lifted out of poverty -- as well as for the rest of us.

With this economic weight comes a new ability to project power, and a rightful claim to foreign policy influence. But China's challenges in the areas of corruption, governance and human rights have the potential to check its rise. The political and economic problems of the West, with which we are all familiar, can hardly compare.

The Bo Xilai and Chen Guangcheng affairs tell us much about modern China. They should also inform our calculations about China's power.

## Prolif Adv

### No Civilian to Military Diversion

#### Capability doesn’t cause diversion---states are deterred by the likelihood of being caught

Justin Alger 9, MA, The Norman Paterson School of international Affairs, Carleton University, 9/09, “From Nuclear Energy to the Bomb: The Proliferation Potential of New Nuclear Energy Programs,” http://www.cigionline.org/sites/default/files/Nuclear\_Energy\_Futures%206.pdf

A once-through nuclear program has much more to offer on this side of the equation. Given the robustness of the nuclear export and safeguards regimes now in existence, a state clandestinely seeking nuclear weapons would be all but required to pursue a peaceful energy program first for the purpose of building up the necessary infrastructure. However, safeguards act as a deterrent to diverting a peaceful nuclear energy program to weapons purposes. A state's policy decision to illicitly develop nuclear weapons must inevitably take into consideration that its known peaceful facilities are being closely monitored by the IAEA, and diverting resources would be difficult to conceal.

With a once-through program scientists acquire the basic tools with which to pursue other nuclear-related technologies including enrichment, reprocessing and device design and assembly. It takes time, resources and determination for a state to disregard its international legal obligations and illicitly pursue a technology it has forsworn to pursue. In terms of sheer capability, however, if a state can successfully operate its own reactor fleet it has the potential to pursue nuclear weapons.

Conclusion

Assessing capability is not the same as assessing a state’s motivation or the likelihood of new nuclear-armed states emerging. To equate capability with the inevitability of proliferation would be little more than a throwback to long-dismissed theories of technological determinism. 47 Predictions made during the 1960s that dozens of new nuclear-armed states would emerge were incorrect and, barring a drastic change in the global order, predictions that several will emerge in the coming decades are likely as inaccurate.

#### Global nuclear renaissance won’t cause prolif---not even latent capabilities

Shahriman Lockman 12, Senior Analyst in the Foreign Policy and Security Studies programme, Institute of Strategic and International Studies, Malaysia, 4/12/12, “An exaggerated risk, yet a real one,” http://www.thebulletin.org/web-edition/roundtables/nuclear-option-the-developing-world-weighs-energy-needs-and-security-risks

As more and more countries in the developing world consider adopting nuclear power, Western governments and the nonproliferation community all too often exaggerate the attendant risks of weapons proliferation. So should concerns about the security implications of new nuclear power programs therefore be abandoned? My answer is no -- not when the resources, institutions, and attitudes needed to ensure nuclear security and safety remain in short supply in the developing world.

In his first essay for this Roundtable, P. R. Kumaraswamy asserted that few countries with nuclear energy programs have sought to develop nuclear weapons. He is correct. Indeed, nonproliferation scholar Matthew Fuhrmann recently analyzed 129 countries, some of which showed interest in nuclear power and some of which did not, between 1965 and 2000. He found little support for the notion that nations pursue nuclear energy in order to lay the foundation for future nuclear weapons programs. In other words, countries do not generally engage in nuclear hedging.

Thus, officials from developing countries are justifiably puzzled by the alarm with which their counterparts in the developed world view nuclear proliferation. The United States, in particular, often regards remote security threats -- including those stemming from nuclear proliferation and nuclear terrorism -- as if they were certainties, despite the fact that the world is arguably less dangerous today than ever before (particularly for the United States). Further, security expert Tom Sauer argues that Europe's nonproliferation policy since 9/11 has increasingly come to resemble that of the United States.

### 2NC No ME War

#### Prefer our ev---theirs exaggerates minor differences and falsely hypes the risk of conflict---recent events prove

Steers 11—Huffington Post writer (Julia, Jordan: Why It's Not A Domino In The Middle East, 2/21/11, [www.huffingtonpost.com/2011/02/21/jordan\_n\_825896.html](http://www.huffingtonpost.com/2011/02/21/jordan_n_825896.html))

In early February, Agence France Press, a leading French news service, published two reports saying the 36 tribesmen, out of a tribal population of over 2 million, had warned Jordan's royal family that their country "will sooner or later be the target of an uprising similar to the ones in Tunisia and Egypt due to the suppression of freedoms and the looting of public funds."

The royal family shot back with a statement condemning the AFP's coverage of the tribal warnings as unsubstantiated and defamatory, and threatening to "pursue legal action" against the news service. Many media outlets pounced saying the face-off meant that deep-seated unrest was brewing in Jordan, just as it was elsewhere in the region.

Unless, of course, it wasn't.

Some analysts say that the rush to define fast-moving, seismic protests has sometimes trumped accuracy in the coverage of the Middle East.

"This frenzy has caught the West by surprise and has resulted in events being reported without analysis, background or research," said Dr. Safwan M. Masri, Director of the Columbia University Middle East Research Center, in an interview with The Huffington Post.

Jordan is an anomaly of sorts, one of the Middle East's few constitutional monarchies. The King wields real executive power, and appoints the the prime minister and the Senate, but the country has a bicameral parliament, with a democratically elected Lower House. Their multi-ethnic population--the country has absorbed many Iraqi and Palestinian refugees in recent decades--is viewed domestically as a source of stability that sets Jordan apart from nearby countries prone to ethnic clashes. The Bedouin tribes, which make up close to 40 percent of the population, have historically been loyal to the monarchy.

# 1NR

## Natural Gas Adv

### No war

#### History proves

Ferguson 6— Laurence A. Tisch prof of History at Harvard. William Ziegler of Business Administration at Harvard. MA and D.Phil from Glasgow and Oxford (Niall, “The Next War of the World,” September/October 2006, http://www.realclearpolitics.com/articles/2006/09/the\_next\_war\_of\_the\_world.html)

Nor can economic crises explain the bloodshed. What may be the most familiar causal chain in modern historiography links the Great Depression to the rise of fascism and the outbreak of World War II. But that simple story leaves too much out. Nazi Germany started the war in Europe only after its economy had recovered. Not all the countries affected by the Great Depression were taken over by fascist regimes, nor did all such regimes start wars of aggression. In fact, no general relationship between economics and conflict is discernible for the century as a whole. Some wars came after periods of growth, others were the causes rather than the consequences of economic catastrophe, and some severe economic crises were not followed by wars.

#### Robust studies prove

Miller 2k – Professor of Management, Ottawa (Morris, Poverty As A Cause Of Wars?, http://www.pugwash.org/reports/pac/pac256/WG4draft1.htm)

Thus, these armed conflicts can hardly be said to be caused by poverty as a principal factor when the greed and envy of leaders and their hegemonic ambitions provide sufficient cause. The poor would appear to be more the victims than the perpetrators of armed conflict. It might be alleged that some dramatic event or rapid sequence of those types of events that lead to the exacerbation of poverty might be the catalyst for a violent reaction on the part of the people or on the part of the political leadership who might be tempted to seek a diversion by finding/fabricating an enemy and going to war. According to a study undertaken by Minxin Pei and Ariel Adesnik of the Carnegie Endowment for International Peace, there would not appear to be any merit in this hypothesis. After studying 93 episodes of economic crisis in 22 countries in Latin America and Asia in the years since World War II they concluded that Much of the conventional wisdom about the political impact of economic crises may be wrong... The severity of economic crisis - as measured in terms of inflation and negative growth - bore no relationship to the collapse of regimes. A more direct role was played by political variables such as ideological polarization, labor radicalism, guerilla insurgencies and an anti-Communist military... (In democratic states) such changes seldom lead to an outbreak of violence (while) in the cases of dictatorships and semi-democracies, the ruling elites responded to crises by increasing repression (thereby using one form of violence to abort another.

#### Econ collapse saps resources from military aggression

Bennett 2k– PolSci Prof, Penn State (Scott and Timothy Nordstrom, Foreign Policy Substitutability and Internal Economic Problems in Enduring Rivalries, Journal of Conflict Resolution, Ebsco)

Conflict settlement is also a distinct route to dealing with internal problems that leaders in rivalries may pursue when faced with internal problems. Military competition between states requires large amounts of resources, and rivals require even more attention. Leaders may choose to negotiate a settlement that ends a rivalry to free up important resources that may be reallocated to the domestic economy. In a “guns versus butter” world of economic trade-offs, when a state can no longer afford to pay the expenses associated with competition in a rivalry, it is quite rational for leaders to reduce costs by ending a rivalry. This gain (a peace dividend) could be achieved at any time by ending a rivalry. However, such a gain is likely to be most important and attractive to leaders when internal conditions are bad and the leader is seeking ways to alleviate active problems. Support for policy change away from continued rivalry is more likely to develop when the economic situation sours and elites and masses are looking for ways to improve a worsening situation. It is at these times that the pressure to cut military investment will be greatest and that state leaders will be forced to recognize the difficulty of continuing to pay for a rivalry. Among other things, this argument also encompasses the view that the cold war ended becausethe Unionof Soviet Socialist Republics could no longer compete economically with the United States.

#### Economic crisis doesn’t lead to instability—statistical studies side strongly negative

Carothers, Carnegie researcher, 9—\*vice president for studies at the Carnegie Endowment for International Peace, \*\*junior fellow in the Democracy and Rule of Law Program at the Carnegie Endowment for International Peace (\*Thomas Carothers, \*\*Julia Brower, 4/28/2009, “Will the International Economic Crisis Undermine Struggling Democracies?”, The Carnegie Endowment for International Peace, http://carnegieendowment.org/2009/04/27/will-international-economic-crisis-undermine-struggling-democracies/dc0)

1. In the great majority of past cases, economic crisis **did not lead to regime change**. In fact, it often did not even lead to a change of government.¶ In the most comprehensive article on this topic, Minxin Pei and David Adesnik (2000) examine the political effects of **93 economic crises**—defined as an annual inflation rate greater than 15 percent, and stagnant or negative annual GDP growth—in Asia and Latin America between 1945 and 1998. Contrary to what might be expected, they find that economic crisis contributed to regime change in only 30 cases. Six of these cases fit the model of an immediate Suharto-style regime collapse; in the rest, regime change occurred after a time lag of about eighteen to 30 months. Perhaps most surprising, however, is their finding that in only about 18 of the remaining 63 cases did economic crisis lead even to a change in government.¶ What explains these findings? Pei and Adesnik speculate that three factors might be at work. First, the **timing has to be right** for economic crises to have an observable political impact. In about one-fifth of the cases with no change, the economic difficulties had ended prior to the next election. Second, in ten of the cases, the economic crisis was **overshadowed** by an existing political crisis. Finally, economic crises were less likely to produce regime change during the 1980s and 1990s than in the previous two decades. That this trend coincides with the most recent **wave of democratization** in Latin America and Asia is no coincidence, and leads to the second major finding of the research.

## Ethanol DA (on natural gas)

### Biofuel DA---Uniqueness---2NC

#### Recent periods of high gas prices have pushed ethanol operations into the red---they’re the key factor that determine ethanol’s viability

Peter Dominici 11, Managing Director, Focus Management Group, January 14, 2011, “How Should Ethanol Producers Respond to External Conditions?,” online: http://www.ethanolproducer.com/articles/7400/how-should-ethanol-producers-respond-to-external-conditions

Ethanol producers in the U.S. are currently feeling the strain of low margins and uncertain tax incentives. The futures pricing for corn, natural gas and ethanol does not provide an outlook for any immediate relief of this strain. In fact, current forecasts of input costs and ethanol sales prices continue to show costs of corn and natural gas exceeding 90 percent of the projected sale price of ethanol. Given such market conditions, to continue to operate and generate profits, ethanol producers must look internally—to their controllable production costs and to their capital structure.

The demand for ethanol in the marketplace is currently subsidized by the U.S. government through the federal tax credit made available to the ethanol producers’ primary customers—the blenders.

The blender’s objective is to earn a profit by mixing or blending lower net-price per gallon ethanol with higher net-price per gallon unleaded gasoline, and then selling the blended fuel to customers at the higher-per gallon unleaded gasoline price. The federal tax credit, which declined from 51 cents per gallon of ethanol purchased by the blender in January 2005 to 45 cents in January 2009, has historically increased a blender’s profit when the blender’s net blended cost of a gallon of E10 gasoline is below the blender’s net purchase price for a gallon of unleaded gasoline.

Further adding to the complexity of the ethanol producer’s business model is an artificial demand side of the market. The U.S. EPA had imposed a ceiling that only allowed ethanol to be blended at a rate of 10 percent ethanol to 90 percent unleaded gasoline in every E10 gallon sold (known as the blend limit), with an annual aggregate ethanol usage ceiling imposed at 10 percent of total U.S. annual unleaded gasoline consumption each year (known as the blending ceiling). This artificially imposed demand ceiling had remained constant at 10 percent, both on the E10 blend limit and on the annual aggregate blending ceiling, since 1978. The combination of the blend limit and the blend ceiling is known in the ethanol industry as the blending wall.

The proposals discussed on including ethanol tax credits in the bill extending the Bush-era tax incentives, which was passed and signed just before Christmas, ranged from eliminating tax incentives for ethanol, to extending them at current levels for one year, to extending them for multiple years at a reduced rate of 36 cents per gallon of ethanol blended.

Over the years, ethanol producers have lobbied to have the mandated 10 percent blending limit raised to 15 percent, and recently the blending limit was raised to 15 percent in some cases. It was not mandated, however. Currently, the decision to blend beyond the current mandate of 10 percent rests with the blenders. Blenders will only blend at the higher level if an appropriate blending profit is available to them.

The recent increase to E15 is also impacted by market conditions. Gasoline that contains 15 percent ethanol can only be used in cars and light trucks sold since 2007. Therefore, even if the blending profit motive exists for blenders to blend, demand will be limited to the percentage of gasoline that is utilized by post-2006 light cars and trucks. The additional complexity in the delivery system for fuel products will also be a limiting factor. As a result, increased demand at the ethanol producer level is uncertain.

Assuming the tax credit remains at 45 cents per gallon of ethanol, raising the blending limit to 15 percent would result in an additional tax credit of 2.3 cents per gallon (45 cents per gallon of ethanol multiplied by the additional 5 percent), assuming the 15 percent blending ratio is used. In contrast, reducing the tax credit to 36 cents per gallon of ethanol reduces the blenders profit by 0.9 cents per gallon (9 cents per gallon of ethanol multiplied by the 10 percent ratio).

External Factor Outlook

Moving forward, ethanol producers will need to analyze the impact of the four variables affecting their business, in conjunction with tax credit changes, blending limit changes, and the price of corn and natural gas. Of the four variables impacting a producer’s profit, three are external—the primary direct costs of corn and natural gas, ethanol prices, and coproduct sales. One is internal—production efficiencies, including conversion rates, natural gas usage, and enzyme and chemical consumption.

The outlook through June does not look good for ethanol producers. The primary external costs to produce a gallon of ethanol (cost of corn per gallon and cost of natural gas per gallon) are projected to be greater than 100 percent of the projected ethanol sales price per gallon over the same time period. Figure 1 displays the relationship between these factors for 2010 and the forecast through June. Historically, ethanol producers do not fare well financially when their primary cost components (corn and natural gas) are greater than 90 percent of ethanol’s sale price.

Figure 2 extends the forecast period from December 2010 to December 2013. The long-term outlook is also weak as the cost of corn and natural gas per gallon of ethanol produced is greater than 90 percent of the projected sales price over that same period.

External factors do not support strong projections for earnings before interest, taxes, depreciation and amortization for ethanol producers. While commodity markets do change, the corn, natural gas and ethanol prices have not resulted in combinations that facilitate strong cash flow performance for ethanol producers since the first quarter of 2008. As a result, assuming external market conditions will improve for ethanol producers is not a viable forecast. Producers cannot look to the external market to correct their financial performance issues. Internal factors related to production efficiencies, overhead costs, and capital structure will need to be the primary focus.

### Biofuel DA---Link---2NC

#### Sustainable low natural gas prices are the key factor enabling advanced, non-corn based biofuels to be cost-effective

Tristan R. Brown 12, practicing attorney and Seeking Alpha contributor, July13, 2012, “Advanced Biofuels And The Shale Gas Revolution,” online: http://seekingalpha.com/article/719491-advanced-biofuels-and-the-shale-gas-revolution

I teach a graduate class on biorenewables and students frequently ask me how the so-called "Shale Gas Revolution" will affect U.S. biorenewables in general and biofuels in particular. A common assumption is that biofuels will be negatively affected by this development, and I expect this view to become even more prevalent in light of Patriot Coal's Chapter 11 bankruptcy filing, which has been attributed in part to coal's inability to compete with cheap natural gas. After all, if inexpensive coal can't compete economically with shale gas as an energy source, then how can we expect our relatively undeveloped biomass reserves to fare any better? Furthermore, if biofuel producers fare best when the price of another fossil fuel, petroleum, is high, then won't they suffer when the price of natural gas is low?

While these are valid points, they ultimately fail to account for the crucial fact that many advanced biofuel pathways (i.e., those utilizing a feedstock other than corn) employ natural gas either directly as is or indirectly as a hydrogen source. The economic feasibility of these pathways should therefore increase as the price of natural gas falls due to reduced operating costs. This article quantifies the increase in the biofuel industry's economic feasibility resulting from the advent of inexpensive shale gas.

Biofuels and Natural Gas

Ethanol, which has historically been the focus of U.S. biofuel industry, is an imperfect transportation fuel due to its relatively high oxygen content. This causes ethanol to damage engines and fuel equipment unless it is blended with large amounts of gasoline prior to use ("gasohol"). It is also responsible for ethanol's low energy value relative to gasoline. Interest in the production of biobased hydrocarbons has increased greatly in recent years as a result of these deficiencies, as these can be refined to produce biobased gasoline (or "drop-in biofuels" due to their ability to utilize unmodified fuel infrastructures, unlike ethanol). Biomass contains up to 50% oxygen by weight (with the remainder comprised of carbon and hydrogen) and this must be removed during the production of biobased gasoline. While multiple deoxygenation routes exist, one of the more attractive options is to react the oxygen in biomass with hydrogen via a process known as hydrodeoxygenation, or hydroprocessing. Hydroprocessing allows the oxygen in biomass to be removed as water, leaving behind the carbon and hydrogen biomass components -- i.e., the building blocks of hydrocarbons. Steam reforming of natural gas accounts for 95% of U.S. hydrogen production [1] and this analysis therefore assumes that the hydrogen consumed during hydroprocessing is derived from natural gas.

A number of commercial-scale biofuel companies are expected to employ natural gas as an inexpensive source of hydrogen. KiOR (KIOR) produces an oxygenated bio-oil via the catalytic pyrolysis of biomass, which is deoxygenated and depolymerized (i.e., split into smaller molecules) into a gasoline blendstock via reaction with hydrogen. Honeywell International (HON) subsidiary UOP has developed a hydroprocessing route that is being used to produce both biobased gasoline and biobased diesel fuel (not to be confused with biodiesel). Ensyn-UOP joint venture Envergent will use UOP's technology to build 15 fast pyrolysis in Malaysia that will produce a bio-oil capable of being hydroprocessed into gasoline and diesel fuel. Rentech (RTK) uses natural gas and biomass and Sundrop Fuels uses biomass and natural gas-derived hydrogen as feedstocks in gasifiers for the production of a syngas that is then converted to biobased gasoline. Finally, the following U.S. producers all react hydrogen with lipids to produce diesel and jet fuels via lipids hydroprocessing:

Altair Fuels

Diamond Green Diesel [a JV between Valero (VLO) and Darling Intl. (DAR)]

Dynamic Fuels [a JV between Syntroleum (SYNM) and Tyson Foods (TSN)]

All of the above projects are notable in that they have commercial-scale biorefineries either in operation or under construction. Use of natural gas will therefore be widespread within the advanced biofuels sector in the near future.

Quantifying the Impact of Shale Gas on Biofuels

When addressing the question of how much of an impact falling natural gas prices will have on biofuel economic feasibility, it is useful to see how shale gas production has affected natural gas prices. The Energy Information Administration's Annual Energy Outlook provides natural gas price projections from before and after the advent of widespread shale gas production. The following figure shows the difference between the EIA's 2010 and 2012 AEOs:

Increased shale gas production has caused natural gas projected prices to decline significantly, especially between 2012 and 2022.

I frequently use techno-economic process models of biofuel pathways to tease out information on pathway economic feasibility. While published models are not available for all of the pathways employed by the biofuel projects listed above, they are available for fast pyrolysis and hydroprocessing, which is similar but not identical to the catalytic pyrolysis and hydroprocessing pathway employed by KiOR. For this analysis I look at the production of both biofuels [2] and commodity chemicals [3] via fast pyrolysis and hydroprocessing. While biofuel production is the nominal focus of this analysis, it is helpful to also look at the production of commodity chemicals (i.e., petrochemicals derived from biomass rather than petroleum) due to the recent trend of biofuels producers switching to chemicals production and its greater profit margins [3]. Modified Excel versions of both models are employed to calculate the 20-year internal rate of return for 2000 metric ton per day biorefineries employing each pathway under the AEO 2010 and AEO 2012 natural gas price scenarios. A higher IRR represents greater economic feasibility.

The results of this analysis show that lower natural prices resulting from increased shale gas production will have a significant positive impact on the fast pyrolysis pathway's economic feasibility:

A similar result can be assumed for the lipids hydroprocessing pathway due to the operational similarities between bio-oil hydroprocessing and lipids hydroprocessing. It is more difficult to quantify the impact on economic feasibility for the aforementioned gasification companies due to their use of natural gas and hydrogen as feedstocks rather than hydroprocessing inputs, although it is most likely positive due to their use of either natural gas or hydrogen as inputs.

Conclusion

A number of advanced biofuel projects in the U.S. employ natural gas either directly as is or indirectly as a hydrogen source. These projects will benefit from the long-term fall in natural gas prices resulting from increased shale gas production. As a result, public biofuel companies and other public companies engaged in biofuel projects such as Darling Intl., Honeywell, KiOR, Rentech, Syntroelum, Rentech, Tyson Foods, and Valero are expected to indirectly benefit from increased shale gas production. While the shale gas revolution is not alone sufficient to make these biofuel projects economically viable, their economic feasibility is greater than it was before the widespread production of shale gas. Investors (as opposed to traders) in these companies should keep an eye on shale gas production and projected natural gas prices as a result.

#### Low natural gas prices are key to feedstock flexibility---it’s a key bridge technology that builds in investor confidence---that’s the only way new biofuels projects can come online and be cost-competitive

Robert J. Johnson 12, Chief Executive Officer at Primus Green Energy, and was formerly the CEO of three advanced alternative fuels companies, July 3, 2012, “Optimistic Realism in Commercializing Biofuels,” online: http://energy.aol.com/2012/07/03/optimistic-realism-in-commercializing-biofuels/

But the theme emerging from the remarks of the more than 100 biofuel executives who spoke at the conference was that biofuel companies should execute this "go big" strategy in carefully considered steps rather than in giant leaps and that the key to staying strong is to hedge their bets at every opportunity, including by increasing the range of feedstock, product and financing options.

In other words, although the mood was one of optimism due to macro trends such as the rising price of oil and the increased energy demand from developing countries like China and India, that optimism has to be tempered with a cautious realism that is cognizant of the pitfalls attendant to bringing new technologies out of the lab and into production, including moving too fast.

Like many other conference participants, Primus Green Energy, an alternative fuels company, is pursuing a strategy of incremental commercialization, which I like to call "proving out what's most provable." Since many process technologies are multi-stage, it's often possible to bring the most developed element to market first instead of waiting to perfect the entire process.

Primus Green Energy has developed an innovative and highly efficient thermo-chemical biomass conversion process yielding a product that is a drop-in substitute for gasoline. We have a pilot plant in operation, we are constructing an integrated demo plant and we are working with Bechtel Hydrocarbon Technology Solutions on plans for our first commercial plant, on which we intend to break ground in 2013.

While we remain committed to producing gasoline from woody and herbaceous biomass, we are moving ahead with our gas-to-liquids (GTL) fuel synthesis process, which produces gasoline from natural gas, rather than waiting for our biomass gasification process to be proven out. Why? For the simple reason that our GTL process - which we term, STG+ - is ready to go and the low price of natural gas makes this option economically attractive.

The advantage of an incremental strategy is that it reduces technology risks and capital costs, generating the funds and the investor confidence to prove out the rest of the technology - in Primus' case, our proprietary biomass gasification process. We plan to integrate our biomass gasification process, which lags in development behind the STG+ process, into our production line once it is fully proven out.

As Voltaire, that Enlightenment-era proponent of the force of reason said, "The perfect is the enemy of the good" – the good in this case being natural gas that is abundant and cheap. The current price of about $2.25 per 1,000 cubic feet represents a 10-year low, and industry analysts have predicted the price could drop to below $1.00. We would be foolish not to take advantage of such an opportunity.

As journalist and author Fareed Zakaria recently noted in the Washington Post, "The United States now has, at current consumption rates, at least 75 years' worth of recoverable natural gas. More important, the United States has become the world's low-cost producer of natural gas."

The same flexibility that allows us to use biomass, natural gas or even waste methane as feedstocks also allows us to produce a variety of end products. We began as an ethanol producer, but shifted to gasoline because of the demand for a drop-in substitute. And if the market demands that we shift to diesel, jet fuel or aromatic chemicals, we can do that as well through simple adjustments to our production process.

We also are flexible in our financial strategies. As an industry, we need to recognize that current market conditions and the experience of biofuel companies that tried to do too much, too fast, particularly in going public too early, may have dampened enthusiasm among some members of the financial community.

Thus, we need to bring an "all of the above" strategy to the financial task of moving new biofuel technologies out of the lab and into production. This includes the potential for government grants and guarantees for strategic investors who will fully fund construction, as well multi-party, multi-tier project financing in which technology and commodity risks are borne by knowledgeable parties.

We also need to plan for less leverage, higher fees and rates, and more time to put deals together, as well as for the use of sophisticated financing tools such as structured insurance products and commodity hedges against price fluctuations.

Although commercializing a first-of-its-kind biofuel technology isn't easy, it isn't impossible either. To achieve success, however, flexibility at the front and back ends of the production process is critical, as is the ability to take advantage of all the tools in the financial universe. It's also important to keep in mind that the impact of your success extends far beyond the boundaries of your plant.

### Biofuel DA---Food Prices Impact---2NC

#### Expanded biofuel production causes skyrocketing global food prices – terminal impact read in the 1nc

William Pentland 7-28, Chair of the Northeast Clean Heat and Power Initiative and Forbes contributor, July 28, 2012, “The Coming Food Crisis: Blame Ethanol?,” online: http://www.forbes.com/sites/williampentland/2012/07/28/the-coming-food-crisis-blame-ethanol/print/

If you believe the folks at the New England Complex Systems Institute in Cambridge, Mass., the global food supply system is stumbling into a drought-induced supply shortage that could galvanize a global food crisis far more severe than those implicated in the widespread uprisings known as the Arab Spring.

In an updated version of a paper first published in September, Marco Lagi, Yavni Bar-Yam and Yaneer Bar-Yam considered the possible consequences of the prolonged drought in the mid-western United States, the worst in half a century, on global food prices. The analysis, which relied on a quantitative model of historical food prices, concluded that the drought could amplify the impact of market speculation and corn-to-ethanol conversion policies on the impending global food crisis by an order of magnitude. To

Recent droughts in the mid-western United States threaten to cause global catastrophe driven by a speculator amplified food price bubble. Here we show the effect of speculators on food prices using a validated quantitative model that accurately describes historical food prices. During the last six years, high and fluctuating food prices have led to widespread hunger and social unrest. While the spring of 2012 had a relative dip in the food prices, a massive drought in the American mid-west in June and July threatens to trigger another crisis . . .

An update to the original paper in February 2012 demonstrated that the model previously published . . . anticipated a new food crisis by the end of 2012 if adequate policy actions were not implemented. Here we provide a second update, evaluating the effects of the current drought on global food prices. We find that the drought may trigger the expected third food price bubble . . . to occur earlier than otherwise expected, beginning immediately . . . [and] rais[ing] prices well beyond an increase justified by the reduced supply caused by the droughts.

In other words, the sky may soon fall for those poor souls who are unable to stomach the marginal increase in food prices. At risk of reiterating the obvious, malnutrition is a matter of life or death.

Everyone agrees that we should not support policies that result in food shortages. The trouble is that nobody agrees what policies are to blame. The NECSI analysis fingers biofuels first and speculators second: “The model showed that, of all the factors proposed to be responsible for the recent dramatic spikes and fluctuations in global food prices, rapid increases in the amount of corn-to-ethanol conversion and speculation on futures markets were the only factors which could justifiably be held responsible.”

#### Independently turns asia conflict

Michael T. Klare 8-7, professor of peace and world security studies at Hampshire College, August 7, 2012, “The Hunger Wars In Our Future,” online: <http://www.tomdispatch.com/blog/175579/>

This, however, is just the beginning of the likely consequences: if history is any guide, rising food prices of this sort will also lead to widespread social unrest and violent conflict.

Food -- affordable food -- is essential to human survival and well-being. Take that away, and people become anxious, desperate, and angry. In the United States, food represents only about 13% of the average household budget, a relatively small share, so a boost in food prices in 2013 will probably not prove overly taxing for most middle- and upper-income families. It could, however, produce considerable hardship for poor and unemployed Americans with limited resources. “You are talking about a real bite out of family budgets,” commented Ernie Gross, an agricultural economist at Omaha’s Creighton University. This could add to the discontent already evident in depressed and high-unemployment areas, perhaps prompting an intensified backlash against incumbent politicians and other forms of dissent and unrest.

It is in the international arena, however, that the Great Drought is likely to have its most devastating effects. Because so many nations depend on grain imports from the U.S. to supplement their own harvests, and because intense drought and floods are damaging crops elsewhere as well, food supplies are expected to shrink and prices to rise across the planet. “What happens to the U.S. supply has immense impact around the world,” says Robert Thompson, a food expert at the Chicago Council on Global Affairs. As the crops most affected by the drought, corn and soybeans, disappear from world markets, he noted, the price of all grains, including wheat, is likely to soar, causing immense hardship to those who already have trouble affording enough food to feed their families.

The Hunger Games, 2007-2011

What happens next is, of course, impossible to predict, but if the recent past is any guide, it could turn ugly. In 2007-2008, when rice, corn, and wheat experienced prices hikes of 100% or more, sharply higher prices -- especially for bread -- sparked “food riots” in more than two dozen countries, including Bangladesh, Cameroon, Egypt, Haiti, Indonesia, Senegal, and Yemen. In Haiti, the rioting became so violent and public confidence in the government’s ability to address the problem dropped so precipitously that the Haitian Senate voted to oust the country’s prime minister, Jacques-Édouard Alexis. In other countries, angry protestors clashed with army and police forces, leaving scores dead.

Those price increases of 2007-2008 were largely attributed to the soaring cost of oil, which made food production more expensive. (Oil’s use is widespread in farming operations, irrigation, food delivery, and pesticide manufacture.) At the same time, increasing amounts of cropland worldwide were being diverted from food crops to the cultivation of plants used in making biofuels.

The next price spike in 2010-11 was, however, closely associated with climate change. An intense drought gripped much of eastern Russia during the summer of 2010, reducing the wheat harvest in that breadbasket region by one-fifth and prompting Moscow to ban all wheat exports. Drought also hurt China’s grain harvest, while intense flooding destroyed much of Australia’s wheat crop. Together with other extreme-weather-related effects, these disasters sent wheat prices soaring by more than 50% and the price of most food staples by 32%.

Once again, a surge in food prices resulted in widespread social unrest, this time concentrated in North Africa and the Middle East. The earliest protests arose over the cost of staples in Algeria and then Tunisia, where -- no coincidence -- the precipitating event was a young food vendor, Mohamed Bouazizi, setting himself on fire to protest government harassment. Anger over rising food and fuel prices combined with long-simmering resentments about government repression and corruption sparked what became known as the Arab Spring. The rising cost of basic staples, especially a loaf of bread, was also a cause of unrest in Egypt, Jordan, and Sudan. Other factors, notably anger at entrenched autocratic regimes, may have proved more powerful in those places, but as the author of Tropic of Chaos, Christian Parenti, wrote, “The initial trouble was traceable, at least in part, to the price of that loaf of bread.”

As for the current drought, analysts are already warning of instability in Africa, where corn is a major staple, and of increased popular unrest in China, where food prices are expected to rise at a time of growing hardship for that country’s vast pool of low-income, migratory workers and poor peasants. Higher food prices in the U.S. and China could also lead to reduced consumer spending on other goods, further contributing to the slowdown in the global economy and producing yet more worldwide misery, with unpredictable social consequences.

### Biofuel DA---Invasive Species Impact---2NC

#### Large-scale cellulosic ethanol causes massive invasive species outbreaks

S. Raghu 6, Illinois Natural Resource Survey, et al., September 2006, “Adding Biofuels to the Invasive Species Fire?,” Science, Vol. 313. no. 5794, p. 1742

Biofuel crops may have economic benefits, but studies of concomitant environmental risks of movement into novel habitats are seldom conducted. Although anecdotal claims of "low risk" for some species (4) may be valid, many purportedly beneficial introduced species have had long-term economic and environmental costs owing to their invasiveness (5, 6). For example, Sorghum halepense is an introduced forage grass that became an invasive weed in 16 of the 48 U.S. states in which it occurs. Even the most conservative estimate of competitive losses for cotton and soybean crops in three states is in excess of $30 million annually (7).

Several grasses and woody species have been evaluated for biofuel production, with perennial rhizomatous grasses showing the most economic promise (4, 8). Arundo donax (giant reed; native to Asia) and Phalaris arundinacea (reed canary grass; native to temperate Europe, Asia, and North America) are two C3 grasses being considered as biofuel species (8) that are invasive in some U.S. ecosystems. The former threatens riparian areas and alters fire cycles (9); the latter invade wetlands (10) and affect wildlife habitat.

The hybrid grass Miscanthus giganteus (native to Asia) and Panicum virgatum (switch-grass; native to central and eastern United States) are C4 grasses being considered in Europe and the United States (4, 11). Several Miscanthus species are invasive or have invasive potential (12); in particular, the parent species of M. giganteus (13, 14). Miscanthus giganteus is an allopolyploid that does not produce viable seed and reproduces vegetatively. However, allopolyploidy does not guarantee continued sterility (15) and vegetative propagation is often associated with invasiveness (16, 17) or directly contributes to it (18). Several other traits that make Miscanthus potentially valuable as a crop could enhance invasiveness (ability to resprout from rhizomes, efficient photosynthetic mechanisms, and rapid growth rates) (16, 19).

The U.S. native, P. virgatum, shares many traits with Miscanthus and can also produce seeds, which may give P. virgatum even greater invasive potential. Furthermore, plants native in one region can become invasive when established elsewhere (20). Escape from competitors and natural enemies may help explain the weedy nature of P. virgatum outside its endemic range (21).

Internationally, there has been little success in eradicating or even controlling an invading grass. Herbicides are used to control invasive grasses on croplands, but they are too expensive to use on rangelands, national parks, and reserves. Development of the most economical tool, biological control with a specific natural enemy, has been avoided because of the perceived risk of its expanding its host range to include commercial grasses, such as wheat, corn, barley, or rice (22).

#### Extinction

Viki Nadol 99, JD Candidate @ Valparaiso, Summer 1999, Northwestern School of Law of Lewis & Clark College, p ln

The threat of invasion by nonnative species has always existed. It is arguably a natural process that should be allowed to continue unheeded. n21 The problem with this theory is that it fails to take into account the rate at which humans are responsible for accelerating the pace of successful introductions, as compared to those that would occur naturally. n22 The last five hundred years or so demarcate an era of human expansion that has resulted in the increasingly rapid disruption and weakening of Earth's eco systems. n23 The fragile condition of these systems renders them vulnerable to the establishment of invasive species. n24 In addition, rates of introduc [\*343] tion have escalated with the advent of new modes of conveyance by trade and travel. n25 Airplanes, boats, and automobiles provide sufficiently quick and spacious travel, facilitating entry of a number of invasive species into habitat zones otherwise out of reach. n26 In the late 1950s, Charles Elton, a renowned British ecologist, warned that modern society was witnessing great historical dislocations of the world's fauna and flora. n27 Indeed, the scope of invasion is alarming, as are its effects. n28 Over 4500 invasive species are now established in the United States. n29 These species greatly threaten biological diversity n30 because they are often able to out-compete and displace native organisms. n31 As would be expected, they also add to the stress already suffered by endangered and threatened native species. n32 One study indicates that invasive species are second only to habitat destruction among the leading causes of species loss nationwide. n33 However, some experts fear that invasive species ultimately will contribute to the demise of the human population by destroying natural processes and ecosystems necessary to human survival. n34

\*\*\*To Footnotes\*\*\*

n30. See infra note 35 and accompanying text. In addition to threatening diversity, invasive species ultimately threaten survival of species as well: As the total number of species declines, plants and animals that may be important food resources, that play a critical role in the food web, or that contain medicinal qualities may disappear. Surviving species will have fewer buffers against catastrophic fluctuations in the environment. If, for example, a fish species loses many or some of its food resources, any threat or damage to the remaining food resource can be far more detrimental to the fish because alternatives have been lost. Thus homogenization of habitats and species can have far-reaching effects. Breaching Natural Barriers, supra note 22, at 8. n31. Quammen, supra note 25, at 66. As one specialist explains, invasive species outgrow, out-mature, and simply out-compete native species. Telephone Interview with Neil Richmond, Shellfish Fishery Biologist, Oregon Dep't of Fish & Wildlife (Nov. 25, 1998) [hereinafter Richmond Interview]. n32. Quammen, supra note 25, at 66 ("[A] report, from the U.N. Environmental Program, declares that almost 20 percent of the world's endangered vertebrates suffer from pressures (competition, predation, habitat transformation) created by exotic interlopers."). n33. Westley et al., supra note 6, at 46. n34. See Quammen, supra note 25, at 68. We come to a certain fretful leap of logic that otherwise thoughtful observers seem willing, even eager, to make: that the ultimate consequence will be the extinction of us. By seizing such a huge share of Earth's landscape, by imposing so wantonly on its providence and presuming so recklessly on its forgivingness, by killing off so many species, they say, we will doom our own species to extinction.