## Add-ons

### 2AC Nuclear Expertise – Nuclear Terror

#### New nukes boosts nuclear expertise

APS (American Physical Society), Report from the APS Panel on Public Affairs Committee on Energy and Environment, June 2008, Readiness of the U.S. Nuclear Workforce for 21st Century Challenges, http://www.aps.org/policy/reports/popa-reports/upload/Nuclear-Readiness-Report-FINAL-2.pdf

The 21st century has brought a growing realization that it is time to reexamine the adequacy of the U.S. nuclear workforce and its ability to deal with many old and new challenges our nation faces. This report draws attention to critical shortages in the U.S. nuclear workforce and to problems in maintaining relevant educational modalities and facilities for training new people. This workforce comprises nuclear engineers, nuclear chemists, radiochemists, health physicists, nuclear physicists, nuclear technicians, and those from related disciplines. As a group they play critical roles in the nation’s nuclear power industry, in its nuclear weapons complex, in its defense against nuclear and other forms of terrorism, and in several aspects of healthcare, industrial processing, and occupational health and safety. Each of these areas presents significantly more dramatic challenges than it did not very many years ago. Each is an important aspect of our national security. Nuclear Power: Past and Present Workforce shortages in the arena of commercial nuclear power, and the problem of maintaining modernized training facilities, mainly stem from the 30-year stasis in U.S. demand for new civilian nuclear power plants1. The number of operating civilian nuclear reactors in the U.S. has remained at about 100 during this time. Thus, U.S. vendors have been forced to look abroad for sales. Some have either ceased construction of new reactors entirely or else significantly scaled back business in this area. Their continuing, largely static, nuclear engineering workforce needs have been met through a combination of hiring those trained in university nuclear engineering programs and retraining others whose original expertise was in some other field (usually mechanical engineering). Retirees from the nuclear Navy also have played an important role. A natural result of this stasis was for many years a greatly reduced interest among undergraduates in nuclear science and engineering programs2. In turn, this put great pressure on U.S. universities to scale back in these areas. Recently, however, the Federal government, through the Department of Energy (DOE), dramatically increased funding for these educational efforts. This played a major role in increasing undergraduate student enrollments in nuclear engineering from a low point of 480 in 1999 to 1,933 in 2007. Declaring the problem to be solved, DOE called for the termination of its university nuclear science and engineering programs for FY 2007. Congress in turn provided reduced funding for FY 2007 and transferred all the programs except reactor fuel services to the Nuclear Regulatory Commission (NRC) for FY 2008. These “feast or famine” gyrations have led to significant instabilities: the number of university nuclear engineering departments has decreased from 66 in the early 1980s to 30 today, and the number of university reactors has dwindled from 63 to 25 during essentially the same period.

#### Key to nuclear forensics

Dr. Mtingwa, Chair of the POPA study on the Readiness of the U.S. Nuclear Workforce for 21st Century Challenges. He is an accelerator physicist and Senior Lecturer at MIT, January 2009 “Readiness of the U.S. Nuclear Workforce for 21st Century Challenges,” January, http://www.aps.org/units/fps/newsletters/200901/mtingwa.cfm)

On another front, the tragedy of September 11, 2001, has brought an intense focus on the issue of national preparedness against terrorism. For emergencies involving a terrorist action or an accident at a nuclear reactor, experts must be ready to respond. Thus it is important to attend to the nuclear workforce needs of the Department of Homeland Security, the Department of Defense, the NRC, and specialized areas of the Department of Energy. An important example of the latter is the Nuclear Emergency Support Team from DOE’s National Nuclear Security Administration that travels to the site of a suspected nuclear or radiological weapon to mitigate the situation. Thus, the nation will need to expand its nuclear workforce to initiate new efforts in nuclear forensics and other parts of the Homeland Security portfolio, and to replace many retiring members of the weapons workforce. For many years, funding for U.S. university nuclear science and engineering research and education has been heavily dependent upon a single source: previously DOE and now the NRC. Therefore, it is no accident that the vitality of the nation’s university nuclear science and engineering education and infrastructure program closely tracked funding support provided by DOE over the last 15 years. As shown in Fig. 1, as DOE’s funding increased in the decade 1997 through 2007, undergraduate student enrollment in nuclear engineering increased – from a low of 480 students in 1999 to a high of 1,933 in 2007. For nuclear engineering students at minority-serving institutions, DOE support created new opportunities. While other factors also contributed to the dramatic increase in undergraduate enrollments, university administrators indicate that increases in Federal funding were indeed an important factor. In the aftermath of the accidents at Three Mile Island in 1979 and Chernobyl in 1986, DOE support for nuclear science and engineering education declined precipitously as industry construction of new plants ceased and student interest and career opportunities declined. In 1997, the President’s Committee of Advisors on Science and Technology issued a report that urged President Clinton to reinvest in university nuclear science and engineering research and education . PCAST also urged him to establish the Nuclear Energy Research Advisory Committee to provide advice to DOE on this reinvestment. In the mid-1990s, the Clinton Administration recognized the potential for a resurgence in nuclear technology, and constituted NERAC in 1998 to advise DOE as it began reinvesting both funds and management attention to rebuilding the educational infrastructure for nuclear science and engineering. This support was implemented by creating a suite of eleven targeted programs, among which perhaps the most influential was the Innovations in Nuclear Infrastructure and Education (INIE) program, which encouraged the development of strategic consortia among universities, DOE national laboratories, and industry. When DOE released its FY2007 budget request, it announced that it had completed its mission in the area of nuclear science and engineering education and made plans to terminate the program. DOE proposed essentially zero funding for nuclear science and engineering education for both FY2007 and FY2008. This signaled a significant reversal of fortune not seen since the early 1990s. DOE proposed to return to the practice of those years by providing only basic fuel services for university research reactors under a new infrastructure program. In FY2007, Congress rejected DOE’s proposal to terminate the program and instead provided $16.5 million – far less than the $27 million the program received in FY2006. In FY2008, Congress again rejected ending the program and allocated $17.9 million in the FY2008 Consolidated Appropriations Act. Of this amount, $2.9 million remained at DOE for university reactor fuel services, and Congress transferred to the NRC $15 million for the rest of the programs. While these funds would defer to some extent the erosion of nuclear science and engineering education in the U.S., they are not sufficient to maintain vital elements of the nation’s programs, particularly the highly successful INIE program. It was last funded in FY2006. As for nuclear chemistry and radiochemistry, these are two fields that overlap in many ways. Simply put, radiochemistry is the study of radioactive elements using chemical techniques, focusing on their radioactive characteristics. Nuclear chemistry is the study of the fundamental properties of nuclei, both radioactive and non-radioactive, using chemical techniques. It is quite close to the field of nuclear physics. There has been a continuing dramatic decrease in the number of Ph.D.s earned annually in nuclear chemistry, as shown in Fig. 2. It reflects the fact that only a handful of U.S. university chemistry departments currently have professors with active research programs in nuclear chemistry. Thus, advanced education in nuclear chemistry education is all but extinct in the United States. If nuclear chemistry and radiochemistry education programs are not reinvigorated, the U.S. will lack the expertise required to pursue promising advanced R&D in a myriad of disciplines. In addition to processing both fresh and spent fuel for nuclear reactors, including basic research on spent fuel separations and transmutation technologies, nuclear chemistry and radiochemistry are also extremely important to the nation’s security and health in the following cross-cutting roles: (1) **nuclear weapons stockpile stewardship**, (2) **nuclear forensics and surveillance of clandestine nuclear activities**, (3) monitoring of radioactive elements in the environment, (4) production of radioisotopes, and (5) **preparation of radiopharmaceuticals for therapeutic and diagnostic medical applications.** When considering the nuclear enterprise, the status of the health physics workforce and its training facilities must be considered. For occupational safety and the protection of the public, health physics professionals are employed in many sectors, including the commercial nuclear power industry, DOE’s national laboratories, homeland security, the NRC, the military and medical facilities. The nation’s health physics capabilities will be impacted negatively over the next decade due to the number of expected retirements, coupled with inadequate numbers of graduates entering the field. Fig. 3 provides data on health physics graduates. Considering that the retirement rate of health physicists in the U.S. is roughly 200 per year , the number of health physics graduates does not allow for much increase in the demand for their services. Turning to university research and training reactors, their number has decreased from 63 in the late 1970’s to 25 today. Recently a number of them have been decommissioned, including those at Cornell University and the University of Michigan. During FY2006, DOE’s INIE Program provided $9.41 million to six consortia consisting of both the higher power (usually 1 MW and above) research reactors as well as the lower power (usually less than 1 MW) training reactors. Research reactors mainly perform state-of-the-art experiments and provide irradiation services for private industry and other researchers. Training reactors mainly provide hands-on experiences for students. The INIE program had numerous significant successes, including helping to increase the number of students studying nuclear science and engineering, stimulating the hiring of new tenure-track faculty, providing seed money for a number of major infrastructure and instrumentation purchases and upgrades, fostering collaborations among members of each consortium and with national laboratories, freeing a number of university reactors from threats of decommissioning, assisting with the establishment of a nuclear technology Associate’s degree program at Linn State Technical College in Missouri, and helping to establish a new undergraduate nuclear engineering program at South Carolina State University, one of the Historically Black Colleges and Universities . That program is the first to be created in over a quarter-century at any U.S. university and is the only undergraduate nuclear engineering program located at an HBCU . Nuclear physicists are an indispensable part of the workforce, since a wealth of high precision actinide fission and neutron capture cross section data is needed to support the design of future nuclear reactors, including advanced light water reactors and Generation IV systems . Without such data, simulation studies would not be accurate enough to lead to reliable designs and conclusions . From their systems analyses, DOE researchers have identified the cross sections of particular importance. The U.S. has neutron source facilities, such as the Los Alamos Neutron Science Center, that can be used for many of the cross section measurements, and capabilities not present in the U.S. usually can be found elsewhere . Many of the cross section measurements are extremely challenging and entirely new techniques need to be developed. Moreover, much more fundamental work is needed to understand the basic physics of nuclear isotopes and their various cross sections. A better theoretical understanding would reduce the uncertainties in many applications. All of these issues are fertile ground for Ph.D. research. Next, to evaluate the supply of nuclear engineers with at least a Bachelor’s degree that is needed for nuclear power generation between now and 2050, it is useful to consider three scenarios: (1) maintaining the current number of nuclear reactors (about 100) without reprocessing, (2) doubling the number of reactors without reprocessing fuel, and (3) doubling the number of reactors while closing the fuel cycle by reprocessing and recycling spent fuel. Due to the shortage of nuclear engineers over recent decades, reactor vendors have resorted to hiring far more mechanical engineers than nuclear engineers and providing them with nuclear-related training. With approximately 35% of nuclear workers reaching retirement age in the next five years , industry will likely see some increase in engineering hiring across the board. This will heighten demands for nuclear engineering education, whether supplied by university programs or by the employers themselves. Scenario 1 has a chance of being sustainable. On the other hand, **doubling the number of nuclear reactors to about 200 by 2050 will require a significant augmentation of the nuclear workforce**. Vendors, utilities, and the NRC will need to increase their ranks by about 300 engineers with some nuclear training per year, plus replace retirees. This **growth in manpower is a direct result of what would be an increasing demand for significantly improved reactor designs, increased reactor operations at the utilities**, and a much greater oversight burden at the NRC. On the other hand, the number of new nuclear engineering graduates at all degree levels entering nuclear employment is about 160. Hence, assuming that the supply of nuclear engineers coming from university training programs follows recent trends, employers will need to train significantly more non-nuclear engineers to do nuclear engineering tasks than they do now. It is doubtful that the massive reactor building campaigns necessary to double the number of reactors by 2050 could thrive under such a burden. The clear message is that **our capability for university-based training of nuclear scientists and engineers cannot be allowed to diminish further.** Scenario 3 is the most problematic. This scenario has all the workforce challenges of Scenario 2, plus the need for highly trained nuclear chemists and radiochemists who are indispensable for reprocessing. Unlike France, the U.S. has no governmental agency charged with educating nuclear chemists and radiochemists. Those wanting to pursue these fields are educated under faculty mentors at universities. The growing scarcity of such mentors has thus led to a crisis in the U.S. In the long haul, **the U.S. will lose ground in its R&D on many fronts,** including devising more efficient and safer methods of processing both fresh and spent fuels for all future nuclear energy scenarios. Nuclear chemists and radiochemists with Ph.D.s would be needed to train the large cadre of radiochemical technicians who would carry out most of this work, and they would be needed at universities and national laboratories to spearhead the research that leads to breakthrough radiochemical technologies. Thus, any venture into spent fuel reprocessing, and fulfilling nuclear chemists’ and radiochemists’ many other cross-cutting roles in such areas as homeland security and public health, **will not be possible unless expertise is imported from abroad**. This modality is made much more difficult by the requirement that **many of these workers must be U.S. citizens**. In the U.S., market-driven forces will not be able to produce additional domestically trained nuclear chemists and radiochemists if the educational infrastructure continues to disappear.Aside from nuclear power, the nation will continue to need a significant number of talented, well-trained nuclear scientists and engineers to maintain the strength of its homeland security and nuclear weapons programs. These complexes must be safeguarded, and this is a clear responsibility of the Federal government. To satisfy these and nuclear power’s demands on the nuclear workforce, the Federal government should stabilize the long-term funding and management of nuclear science and engineering education programs, in particular for the university research and training reactor facilities. The number of nuclear engineering departments and university reactors should not be allowed to diminish further. Also, existing reactors could be utilized more optimally by expanding distance-learning opportunities. As for nuclear chemistry and radiochemistry, there is a huge need for the Federal government to establish a cross-cutting workforce initiative that includes fellowships and scholarships for students, support for postdoctoral researchers, incentives that stimulate industrial support of faculty positions, effective means of outreach to the general public, and increased support for summer schools in these disciplines. For health physics, the Federal government should ensure that there is a sufficient number of faculty with nuclear reactor-related experience to train the necessary numbers of health physicists for the nuclear power and other industries. Finally, the Federal government should increase support for research on the fundamental physics and chemistry of actinide fission and neutron capture. There is also an educational role for private industry. Nuclear vendors and utilities should expand undergraduate student internships, graduate student traineeships, cooperative education opportunities, and training on reactor simulators at their facilities. To conclude, creating new reactor designs, revolutionary medical applications of radiation, and many other nuclear endeavors present exciting challenges. As such, the nuclear science and engineering community should develop programs to **encourage the general public to view these fields as exciting areas of research** that present intellectually and financially rewarding career paths.

#### Effective nuclear forensics deters terrorism

Talmadge, IR & Government Prof-George Washington, PhD-MIT, Spring 2007, “Deterring a Nuclear 9/11,” www.twq.com/07spring/docs/07spring\_talmadge.pdf

Because terrorists lack return addresses, analysts have dismissed even more firmly the possibility of deterrence by punishment, or the threat to impose un­bearable costs on those who would do the United States harm. This disheart­ening conclusion stems from a failure to appreciate the many steps terrorists must take before committing an actual attack. Many of these steps depend on assistance from people and organizations that may not be as impervious to deterrence by punishment as individual terrorists are. If the United States can broaden the range of actors it seeks to deter and convince these other actors that cooperating with terrorists is not in their interests, it may be able to re­duce the likelihood of a terrorist attack substantially.13 Nowhere is this approach more plausible than in the case of nuclear terror­ism.14 Unlike other forms of terrorism in which terrorists are more or less self-sufficient, it is virtually impossible for terrorists to create their own nuclear material, regardless of which ingredient they use. Producing plutonium requires sophisticated, expensive reactors, as well as reprocessing facili­ties. Enriching uranium to a weapons-grade lev­el can be done through several techniques; all require relatively large buildings and advanced technologies.15 Both paths to nuclear material require a sizable and scientifically knowledge­able labor force, significant industrial resources, and time. Weapons design and delivery pose additional obstacles. States such as Argentina, Iran, Iraq, and Libya have tried to produce nuclear weapons and failed. Aum Shinrikyo, one of the best-funded terrorists groups in history and instigator of the 1995 sarin gas attacks in Tokyo, was also unable to create its own nuclear material and had to attempt to buy it from Russia.16 As such, it is extremely likely that states or substate military organizations would have to be involved in the tacit or overt provision of nuclear material to terrorists. A state could directly and deliberately transfer a weapon or materi­als to terrorists. It could refuse to halt or punish those in the military or sci­entific community who sell material or weapons to terrorists. It could willfully neglect nuclear security or choose not to alert the international community to suspected thefts of material or weapons. It could turn a blind eye to terrorist activities occurring on its territory. In all of these cases, the United States does have a target against which it can direct threats of retaliation: the governments or military and scientific establishments that actively or passively assist aspiring nuclear terrorists. Even if the United States cannot deter individual terrorists, it can create strong incentives for these other actors to block terrorist acquisition of the ingredi­ents required for a nuclear attack. They have addresses, lives, and property that the United States can hold hostage to their wholehearted cooperation. As Paul Davis and Brian Jenkins of RAND have argued, “The United States could announce credibly that … it would punish not only active supporters, but even those states and factions that merely tolerate the terrorists or indi­rectly facilitate their acquisition of [weapons of mass destruction (WMD)]. The purpose would be to so alarm heads of state and heads of substate organi zations that they would work actively to get rid of elements that might bring destruction down upon them.”17 Bush threatened as much after the North Korean test, warning that the Unit­ed States would hold the regime “fully accountable” if it passed nuclear materi­als or weapons to terrorists.18 The 2006 version of the U.S. National Security Strategy reflects a similar logic, suggesting a subtle shift from the 2002 docu­ment. In describing “a new deterrence calculus,” the current strategy declares, “States that harbor and assist terrorists are as guilty as the terrorists, and they will be held to account.” That document, along with analysts such as Gallucci who argue that a form of “expanded deterrence” against nuclear terrorism is possible, points to the crucial importance of being able to “define the nature and source of a terrorist-employed WMD. Should a WMD terrorist attack occur, the rapid identification of the source and perpetrator of an attack will enable our response efforts and may be critical in disrupting follow-on attacks.”19 In other words, nuclear forensics is the linchpin of any attempt at a deter­rence-by-punishment strategy against governments, militaries, or other orga­nizations that might actively or passively assist terrorists in a nuclear attack on the United States.20

#### Global nuclear war

Robert Ayson, Professor of Strategic Studies and Director of the Centre for Strategic Studies: New Zealand at the Victoria University of Wellington, 2010, “After a Terrorist Nuclear Attack: Envisaging Catalytic Effects,” Studies in Conflict & Terrorism, Volume 33, Issue 7, July, Available Online to Subscribing Institutions via InformaWorld)

A terrorist nuclear attack, and even the use of nuclear weapons in response by the country attacked in the first place, would not necessarily represent the worst of the nuclear worlds imaginable. Indeed, there are reasons to wonder whether nuclear terrorism should ever be regarded as belonging in the category of truly existential threats. A contrast can be drawn here with the global catastrophe that would come from a massive nuclear exchange between two or more of the sovereign states that possess these weapons in significant numbers. Even the worst terrorism that the twenty-first century might bring would fade into insignificance alongside considerations of what a general nuclear war would have wrought in the Cold War period. And it must be admitted that as long as the major nuclear weapons states have hundreds and even thousands of nuclear weapons at their disposal, there is always the possibility of a truly awful nuclear exchange taking place precipitated entirely by state possessors themselves. But these two nuclear worlds—a non-state actor nuclear attack and a catastrophic interstate nuclear exchange—are not necessarily separable. It is just possible that some sort of terrorist attack, and especially an act of nuclear terrorism, could precipitate a chain of events leading to a massive exchange of nuclear weapons between two or more of the states that possess them. In this context, today’s and tomorrow’s terrorist groups might assume the place allotted during the early Cold War years to new state possessors of small nuclear arsenals who were seen as raising the risks of a catalytic nuclear war between the superpowers started by third parties. These risks were considered in the late 1950s and early 1960s as concerns grew about nuclear proliferation, the so-called n+1 problem. It may require a considerable amount of imagination to depict an especially plausible situation where an act of nuclear terrorism could lead to such a massive inter-state nuclear war. For example, in the event of a terrorist nuclear attack on the United States, it might well be wondered just how Russia and/or China could plausibly be brought into the picture, not least because they seem unlikely to be fingered as the most obvious state sponsors or encouragers of terrorist groups. They would seem far too responsible to be involved in supporting that sort of terrorist behavior that could just as easily threaten them as well. Some possibilities, however remote, do suggest themselves. For example, how might the United States react if it was thought or discovered that the fissile material used in the act of nuclear terrorism had come from Russian stocks,40 and if for some reason Moscow denied any responsibility for nuclear laxity? The correct attribution of that nuclear material to a particular country might not be a case of science fiction given the observation by Michael May et al. that while the debris resulting from a nuclear explosion would be “spread over a wide area in tiny fragments, its radioactivity makes it detectable, identifiable and collectable, and a wealth of information can be obtained from its analysis: the efficiency of the explosion, the materials used and, most important … some indication of where the nuclear material came from.”41 Alternatively, if the act of nuclear terrorism came as a complete surprise, and American officials refused to believe that a terrorist group was fully responsible (or responsible at all) suspicion would shift immediately to state possessors. Ruling out Western ally countries like the United Kingdom and France, and probably Israel and India as well, authorities in Washington would be left with a very short list consisting of North Korea, perhaps Iran if its program continues, and possibly Pakistan. But at what stage would Russia and China be definitely ruled out in this high stakes game of nuclear Cluedo? In particular, if the act of nuclear terrorism occurred against a backdrop of existing tension in Washington’s relations with Russia and/or China, and at a time when threats had already been traded between these major powers, would officials and political leaders not be tempted to assume the worst? Of course, the chances of this occurring would only seem to increase if the United States was already involved in some sort of limited armed conflict with Russia and/or China, or if they were confronting each other from a distance in a proxy war, as unlikely as these developments may seem at the present time. The reverse might well apply too: should a nuclear terrorist attack occur in Russia or China during a period of heightened tension or even limited conflict with the United States, could Moscow and Beijing resist the pressures that might rise domestically to consider the United States as a possible perpetrator or encourager of the attack? Washington’s early response to a terrorist nuclear attack on its own soil might also raise the possibility of an unwanted (and nuclear aided) confrontation with Russia and/or China. For example, in the noise and confusion during the immediate aftermath of the terrorist nuclear attack, the U.S. president might be expected to place the country’s armed forces, including its nuclear arsenal, on a higher stage of alert. In such a tense environment, when careful planning runs up against the friction of reality, it is just possible that Moscow and/or China might mistakenly read this as a sign of U.S. intentions to use force (and possibly nuclear force) against them. In that situation, the temptations to preempt such actions might grow, although it must be admitted that any preemption would probably still meet with a devastating response. As part of its initial response to the act of nuclear terrorism (as discussed earlier) Washington might decide to order a significant conventional (or nuclear) retaliatory or disarming attack against the leadership of the terrorist group and/or states seen to support that group. Depending on the identity and especially the location of these targets, Russia and/or China might interpret such action as being far too close for their comfort, and potentially as an infringement on their spheres of influence and even on their sovereignty. One far-fetched but perhaps not impossible scenario might stem from a judgment in Washington that some of the main aiders and abetters of the terrorist action resided somewhere such as Chechnya, perhaps in connection with what Allison claims is the “Chechen insurgents’ … long-standing interest in all things nuclear.”42 American pressure on that part of the world would almost certainly raise alarms in Moscow that might require a degree of advanced consultation from Washington that the latter found itself unable or unwilling to provide. There is also the question of how other nuclear-armed states respond to the act of nuclear terrorism on another member of that special club. It could reasonably be expected that following a nuclear terrorist attack on the United States, both Russia and China would extend immediate sympathy and support to Washington and would work alongside the United States in the Security Council. But there is just a chance, albeit a slim one, where the support of Russia and/or China is less automatic in some cases than in others. For example, what would happen if the United States wished to discuss its right to retaliate against groups based in their territory? If, for some reason, Washington found the responses of Russia and China deeply underwhelming, (neither “for us or against us”) might it also suspect that they secretly were in cahoots with the group, increasing (again perhaps ever so slightly) the chances of a major exchange. If the terrorist group had some connections to groups in Russia and China, or existed in areas of the world over which Russia and China held sway, and if Washington felt that Moscow or Beijing were placing a curiously modest level of pressure on them, what conclusions might it then draw about their culpability? If Washington decided to use, or decided to threaten the use of, nuclear weapons, the responses of Russia and China would be crucial to the chances of avoiding a more serious nuclear exchange. They might surmise, for example, that while the act of nuclear terrorism was especially heinous and demanded a strong response, the response simply had to remain below the nuclear threshold. It would be one thing for a non-state actor to have broken the nuclear use taboo, but an entirely different thing for a state actor, and indeed the leading state in the international system, to do so. If Russia and China felt sufficiently strongly about that prospect, there is then the question of what options would lie open to them to dissuade the United States from such action: and as has been seen over the last several decades, the central dissuader of the use of nuclear weapons by states has been the threat of nuclear retaliation. If some readers find this simply too fanciful, and perhaps even offensive to contemplate, it may be informative to reverse the tables. Russia, which possesses an arsenal of thousands of nuclear warheads and that has been one of the two most important trustees of the non-use taboo, is subjected to an attack of nuclear terrorism. In response, Moscow places its nuclear forces very visibly on a higher state of alert and declares that it is considering the use of nuclear retaliation against the group and any of its state supporters. How would Washington view such a possibility? Would it really be keen to support Russia’s use of nuclear weapons, including outside Russia’s traditional sphere of influence? And if not, which seems quite plausible, what options would Washington have to communicate that displeasure? If China had been the victim of the nuclear terrorism and seemed likely to retaliate in kind, would the United States and Russia be happy to sit back and let this occur? In the charged atmosphere immediately after a nuclear terrorist attack, how would the attacked country respond to pressure from other major nuclear powers not to respond in kind? The phrase “how dare they tell us what to do” immediately springs to mind. Some might even go so far as to interpret this concern as a tacit form of sympathy or support for the terrorists. This might not help the chances of nuclear restraint.

### 2AC China Grid Add On

#### Nuclear expansion key to grid stability

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Nuclear consultant, Margaret Harding, offers her insights into how smart grid technologies can boost storage capacity on the already constrained US grid network. She also looks at how nuclear's demand response record could actually help solar projects and overall power stability across the US. By Margaret Harding The concept that smart grids are separate from, and conflict with, traditional grids has been discussed in recent times. A key fact that has to be understood is that the current electricity grid in the US is a demand system. That is, electricity is generated as it is demanded. Very little storage capacity is available on the grid today. This makes electricity generation, transmission and distribution among the most complex systems in the world. This relative inelasticity of the industry is at the heart of the issues of intermittent power supplies and demand response. In the past, electricity supply was generated through means that were fairly well controlled. Baseload was provided by coal, hydro, and nuclear with some natural gas and other sources. Natural gas and some of the older less efficient oil units were used to manage demand with highly responsive systems coming on line as demand increased. Stressed out grid However, with the advent of intermittent power suppliers like wind and solar, and changing load curves due to increasing electricity usage (electric cars, more electrical appliances and equipment), the traditional methods of managing the grid are being significantly stressed. In addition, there are significant losses of electricity occurring in the current US transmission and distribution (T&D) system as well as inflexibility for transmission of electricity across long distances required to use intermittent sources that are generally more available in the west at major population and industrial centers in the east. Voltage events, even minor reductions in voltage, have increasingly significant effects on society. With the increased use of computers and sensitive electronics both as stand- alone devices and as a part of equipment used both in industrial and residential applications, we need to find ways to assure the reliability of the grid is as high as possible. What is ‘smart grid’? Smart grid is really about improving the reliability of the overall electricity supply. This entails managing supply as well as demand, but most importantly, the T&D of electricity. By better sensing and prediction of potential issues, including intermittent sources like wind and solar, faults such as transformer failures, or voltage irregularities, and increasing demand, a “smarter grid” will allow various energy sources to work together more effectively with fewer issues reaching the industrial, commercial, and residential consumers of electricity. Where does nuclear fit in? How do nuclear energy facilities contribute to the overall reliability of energy supply? And how can they support some of the other initiatives on the grid? In the US, generation and T&D have been separated in many markets. This separation means that nuclear generators don’t have direct ability to improve the reliability and detection of grid events in the T&D. However, it does not mean that nuclear utilities do not contribute to grid reliability. Nuclear energy tends to be used as base load supply. The reasons for this are primarily economic, though technology does play a role. The economic reasons center around the fact that nuclear is a capital intensive energy source. Because the majority of costs are in the design and construction of the facility, the owners of these plants need to operate them as much as possible to maximize the return on their investments. Nuclear power plants can load follow, but at an efficiency cost in fuel use. Such load-following operation has to be planned for well in advance to assure safe operation of the plant at varying power conditions. Since most utilities want to maximize investment, they are reluctant to plan in advance of intentional operation at other than 100 per cent power. This drive to be base load makes current nuclear energy facilities less an ideal match with wind energy for daily interaction where intermittency is less predictable and peak availability tends to occur in early morning hours when demand is low. In a more seasonal evaluation, most nuclear plants target outages for spring and fall, both periods when wind is more reliably available and seasonal demand tends to be lower. Nuclear solar combo Nuclear and solar, however, can work together in some interesting and more optimal ways. Because solar is tied to hours of daylight and tends to peak at midday when demand is starting to rise to peak as well, nuclear and solar can work as baseload and peak demand response very effectively. In addition, nuclear load-following is best used when a predictable pattern of reduced power and increased power can be used. As solar tends to be more predictable in its cyclical availability, nuclear energy fuel planning can be designed to work in concert with these arrays, should the amount of solar power being generated exceed demand. Solid base of reliable power Aside from nuclear’s direct interaction with intermittent sources, nuclear power plants can have their own impact on grid reliability. Responding to a loss of 1000 MW or more of electricity during peak demand periods can risk cascading failures if unexpected plant trips occur during operation. Nuclear utilities have worked to continue to improve the reliability of these machines, with capacity factors moving into the 90% range and providing a solid base of reliable power. Unplanned reactor outages have become increasingly rare and allow grid operators to rely on nuclear energy for base load demand. In addition, nuclear utilities have increased the robustness of their facilities to withstand loss of power events. By ensuring that the facilities will be available even during severe weather events, or that they can get back online quickly in the event of grid damage, nuclear energy facilities serve as anchor points in regional grid structures that can keep power delivery to consumers.

#### Grid vulnerability allow China to launch cyberattacks and invade Taiwan

The next world war might not start with a bang, but with a blackout. An enemy could send a few lines of code to control computers at key power plants, causing equipment to overheat and melt down, plunging sectors of the U.S. and Canadian grid into darkness. Trains could roll to a stop on their tracks, while airport landing lights wink out and the few traffic lights that remain active blink at random. In the silence and darkness, citizens may panic, or they may just sit tight and wait for it all to reboot. Either way, much of the country would be blind and unresponsive to outside events. And that might be the enemy's objective: Divert America's attention while mounting an offensive against another country. Pentagon planners have long understood the danger of cyber attacks on U.S. military networks. Indeed, the Defense Department's Global Information Grid is one of the most frequently targeted computer networks on Earth. But the cat-and-mouse game of information espionage on military networks is not the only digital threat that keeps national-security experts up at night. There is a growing concern over the vulnerability of far more tangible assets essential to the economy and well-being of American citizens. Much of the critical infrastructure that keeps the country humming--water-treatment facilities, refineries, pipelines, dams, the electrical grid--is operated using a hodgepodge of technologies known as industrial control systems. Like banks and telecommunications networks, which are also generally considered critical infrastructure, these industrial facilities and utilities are owned by private companies that are responsible for maintaining their own security. But many of the control systems in the industrial world were installed years ago with few or no cyber-security features. That wasn't a big problem when these systems were self-contained. But in the past two decades, many of these controls have been patched into company computer networks, which are themselves linked to the Internet. And when it comes to computer security, a good rule of thumb is that any device that is computer-controlled and networked is vulnerable to hacking. Bad-guy hackers pulling the plug on public utilities is a common theme of Hollywood films, including 2007's Live Free or Die Hard, but such scenarios present more than a mere fictional scare to U.S. intelligence officials. According to Melissa Hathaway, cyber-coordination executive for the Office of the Director of National Intelligence, the list of potential adversaries in a cyber attack is long, ranging from disgruntled employees to criminals to hostile nations. Most experts agree that China and Russia routinely probe our industrial networks, looking for information and vulnerabilities to use as leverage in any potential dispute. James Lewis, a cyber-security expert for the policy think tank Center for Strategic and International Studies (CSIS), says that although cyber warfare couldn't cripple the U.S., it could serve as an effective military tactic. "If I were China, and I were going to invade Taiwan," he says, "and I needed to complete the conquest in seven days, then it's an attractive option to turn off all the electricity, screw up the banks and so on." Could the entire U.S. grid be taken down in such an attack? "The honest answer is that we don't know," Lewis says. "And I don't like that answer."

#### Extinction

Straits Times (Singapore), June 25, 2000, No one gains in war over Taiwan

THE high-intensity scenario postulates a cross-strait war escalating into a full-scale war between the US and China. If Washington were to conclude that splitting China would better serve its national interests, then a full-scale war becomes unavoidable.Conflict on such a scale would embroil other countries far and near and -horror of horrors -raise the possibility of a nuclear war. Beijing has already told the US and Japan privately that it considers any country providing bases and logistics support to any US forces attacking China as belligerent parties open to its retaliation. In the region, this means South Korea, Japan, the Philippines and, to a lesser extent, Singapore. If China were to retaliate, east Asia will be set on fire. And the conflagration may not end there as opportunistic powers elsewhere may try to overturn the existing world order. With the US distracted, Russia may seek to redefine Europe's political landscape. The balance of power in the Middle East may be similarly upset by the likes of Iraq. In south Asia, hostilities between India and Pakistan, each armed with its own nuclear arsenal, could enter a new and dangerous phase. Will a full-scale Sino-US war lead to a nuclear war? According to General Matthew Ridgeway, commander of the US Eighth Army which fought against the Chinese in the Korean War, the US had at the time thought of using nuclear weapons against China to save the US from military defeat. In his book The Korean War, a personal account of the military and political aspects of the conflict and its implications on future US foreign policy, Gen Ridgeway said that US was confronted with two choices in Korea -truce or a broadened war, which could have led to the use of nuclear weapons. If the US had to resort to nuclear weaponry to defeat China long before the latter acquired a similar capability, there is little hope of winning a war against China 50 years later, short of using nuclear weapons. The US estimates that China possesses about 20 nuclear warheads that can destroy major American cities. Beijing also seems prepared to go for the nuclear option. A Chinese military officer disclosed recently that Beijing was considering a review of its "non first use" principle regarding nuclear weapons. Major-General Pan Zhangqiang, president of the military-funded Institute for Strategic Studies, told a gathering at the Woodrow Wilson International Centre for Scholars in Washington that although the government still abided by that principle, there were strong pressures from the military to drop it. He said military leaders considered the use of nuclear weapons mandatory if the country risked dismemberment as a result of foreign intervention. Gen Ridgeway said that should that come to pass, we would see the destruction of civilisation.

## NG

#### Venting is a common industry practice

Robert Howarth et al, David R. Atkinson Professor of Ecology & Environmental Biology at Cornell, 1-10-2012, “Venting and Leaking of Methane from Shale Gas Development: response to cathles et al.”, http://www.eeb.cornell.edu/howarth/Howarthetal2012\_Final.pdf

Is it unsafe for industry to vent gas during flowback, as Cathles et al. assert? Perhaps, but¶ venting appears to be common industry practice, and the latest estimates from EPA (2011b,¶ page 3–12) are that 85% of flowback gas from unconventional wells is vented and less than¶ 15% flared or captured. While visiting Cornell, a Shell engineer stated Shell never flares gas¶ during well completion in its Pennsylvania Marcellus operations (Bill Langin, pers. comm.).¶ Venting of flow-back methane is clearly not as unsafe as Cathles et al. (2012) believe, since¶ methane has a density that is only 58% that of air and so would be expected to be extremely¶ buoyant when vented. Under sufficiently high wind conditions, vented gas may be mixed and¶ advected laterally rather than rising buoyantly, but we can envision no atmospheric conditions¶ under which methane would sink into a layer over the ground. Buoyantly rising methane is¶ clearly seen in Forward Looking Infra Red (FLIR) video of a Pennsylvania well during¶ flowback (Fig. 1). Note that we are not using this video information to infer any information¶ on the rate of venting, but simply to illustrate that venting occurred in the summer of 2011 in¶ Pennsylvania and that the gas rose rapidly into the atmosphere. Despite the assertion by Cathles¶ et al. that venting is illegal in Pennyslvania, the only legal restriction is that “excess gas¶ encountered during drilling, completion or stimulation shall be flared, captured, or diverted¶ away from the drilling rig in a manner than does not create a hazard to the public health or¶ safety” (PA § 78.73. General provision for well construction and operation).

#### Small leakages are sufficient – methane is overwhelming greenhouse gas

Abrahm Lustgarten, MA in journalism from Columbia, received a grant from the John D. and Catherine T. MacArthur Foundation, 1-25-2011, “Climate Benefits of Natural Gas May Be Overstated,” Pro Publica, http://www.propublica.org/article/natural-gas-and-coal-pollution-gap-in-doubt

Robert Howarth, an environmental biology professor at Cornell University, used research from the United Nations to calculate that if methane’s potency were considered over 20 years rather than 100 years, it would be 72 times as powerful as carbon dioxide in terms of its warming potential.¶ Figured that way, the climate effect of methane from natural gas would quickly outpace the climate effect of carbon dioxide from burning coal. Howarth’s research is incomplete and has been criticized because at first he failed to figure in methane emissions from coal mining. But he said that after correcting his error, the emissions from coal barely changed, and the data still showed that the intensity of methane could erase the advantages of using natural gas.¶ “Even small leakages of natural gas to the atmosphere have very large consequences,” Howarth wrote in a March memorandum, which he says is a precursor to a more thorough study that could begin to scientifically answer these questions. “When the total emissions of greenhouse gases are considered … natural gas and coal from mountaintop removal probably have similar releases, and in fact natural gas may be worse in terms of consequences on global warming.”

#### Switch to Natural gas causes runaway warming – fugitive and life cycle emissions of more harmful chemicals

Stephen Lacey, staff writer, 7-6-2012, “King Coal’s Throne Under Threat?” Think Progress, http://thinkprogress.org/climate/2012/07/06/512192/king-coals-throne-under-threat-us-natural-gas-generation-rivals-coal-in-april/

However, a large-scale switch to gas is no environmental panacea. Along with local air and water-quality concerns from natural gas fracking, scientists and environmental regulators are increasingly warning about lifeycle methane emissions from gas. Methane is a greenhouse gas 25 times more potent than carbon dioxide over a 100-year period. While there is still no definitive study on the methane intensity of natural gas, recent research suggests that leakages in the drilling and transport of gas could make it more harmful than coal.¶ Reacting to the concerns about methane leakages, a group of investors worth $20 trillion in assets recently penned a letter to the oil and gas industry calling on companies to proactively address the problem. Craig McKenzie, Head of Sustainability for the Scottish Widows Investment Partnership, told Climate Progress that his organization believes natural gas does play a role in the current energy transition — but not without controls on methane:¶ “Many climate hawks are skeptical that the shale gas revolution has any role to play in tackling climate change. We disagree – there’s a narrow window of a decade or two where it could help significantly. It may just be the fastest way to eliminate coal from the power sector in the US, and may be China. This isn’t just theoretical. US coal power generation has fallen a massive 20% in one year largely, due to switching to cheap shale gas. But, as we’ve argued, even this defense of gas falls apart if the industry doesn’t eliminate fugitive methane emissions, which cancel out the climate benefit of a coal-gas switch for the first few decades. This major new investor initiative calling for best practice methane control technology and better regulation – globally – is intended to help make shale gas serve its climate purpose.”¶ Scottish Widows Investment Partnership, a major investor in fossil fuel projects, recently released a report concluding that that fugitive methane emissions from natural gas wipe out any climate benefits from a shift away from coal. The International Energy Agency has also warned that a massive global switch to natural gas could result in more than 6 degree F warming — resulting in out-of-control desertification, water shortages, and continued sea level rise.

## Growth

#### Growth sustainable – tech causes decoupling

Brent Barker, electrical engineer, and manager of corporate communications for the Electric Power Research Institute and former industrial economist and staff author at SRI International and as commercial research analyst at USX Corporation, Summer 2000, “Technology and the Quest for Sustainability.” EPRI Journal, infotrac.

In the twenty-first century, industrial processes will be revolutionized by new electrotechnologies, including lasers, plasmas, microwaves, and electron beams for materials processing, as well as electrochemical synthesis and electroseparation for chemical processing. Manufacturing will be revolutionized by a host of emerging technology platforms--for example, nanotechnology, biotechnology, biomimetics, high-temperature superconductivity, and network technology including the combining of advanced sensors with information technology to create adaptive, intelligent systems and processes. Future industrial facilities using advanced network technologies will be operated in new ways to simultaneously optimize productivity energy use, materials consumption, and plant emissions. Optimization will extend beyond the immediate facility to webs of facilities supporting industrial and urban ecology with the waste of one stream becoming the feedstock of the next. In the aggregate, the penetration of all the emerging technologies into the global economy should make it possible to sustain industrial productivity growth rates above 2% per year for many decades. The same technology platforms will be used to improve the efficiency of land, energy and water use, For example, distributed sensors and controls that enable precision farming can improve crop yields and reduce land and water use. And doubling or even tripling global energy efficiency in the next century is well within our means. Given the inefficiencies that now exist at every stage in the process--from mining and drilling for fuel through the use of energy in automobiles, appliances, and processes--the overall efficiency of the energy chain is only about 5%. From a social standpoint, accelerating productivity is not an option but rather an imperative for the future. It is necessary in order to provide the wealth for environmental sustainability, to support an aging population in the industrialized world, and to provide an economic ladder for developing nations. The second area of opportunity for technology lies in its potential to help stabilize global population at 10-12 billion sometime in the twenty-first century, possibly as early as 2075. The key is economics. Global communications, from television to movies to the Internet, have brought an image of the comfortable life of the developed world into the homes of the poorest people, firing their own aspirations for a better quality of life, either through economic development in their own country or through emigration to other countries. If we in the developed world can make the basic tools of prosperity--infrastructure, health care, education, and law--more accessible and affordable, recent history suggests that the cultural drivers for producing large families will be tempered, relatively quickly and without coercion. But the task is enormous. The physical prerequisites for prosperity in the global economy are electricity and communications. Today, there are more than 2 billion people living without electricity, or commercial energy in any form, in the very countries where some 5 billion people will be added in the next 50 years. If for no other reason than our enlightened self-interest, we should strive for universal access to electricity, communications, and educational opportunity. We have little choice, because the fate of the developed world is inextricably bound up in the economic and demographic fate of the developing world. A third, related opportunity for technology is in decoupling population growth from land use and, more broadly, decoupling economic growth from natural resource consumption through recycling, end-use efficiency, and industrial ecology. Decoupling population from land use is well under way. According to Grubler, from 1700 to 1850 nearly 2 hectares of land (5 acres) were needed to support every child born in North America, while in the more crowded and cultivated regions of Europe and Asia only 0.5 hectare (1.2 acres) and 0.2 hectare (0.5 acre) were needed, respectively. During the past century, the amount of land needed per additional child has been dropping in all areas of the world, with Europe and North America experiencing the fastest decreases. Both crossed the "zero threshold" in the past few decades, meaning that no additional land is needed to support additional children and that land requirements will continue to decrease in the future. One can postulate that the pattern of returning land to nature will continue to spread throughout the world, eventually stemming and then reversing the current onslaught on the great rain forests. Time is critical if vast tracts are to be saved from being laid bare, and success will largely depend on how rapidly economic opportunities expand for those now trapped in subsistence and frontier farming. In concept, the potential for returning land to nature is enormous. Futurist and scholar Jesse Ausubel of the Rockefeller University calculates that if farmers could lift average grain yields around the world just to the level of today's average U.S. corn grower, one-half of current global cropland--an area the size of the Amazon basin--could be spared. If agriculture is a leading indicator, then the continuous drive to produce more from less will prevail in other parts of the economy Certainly with shrinking agricultural land requirements, water distribution and use around the world can be greatly altered, since nearly two-thirds of water now goes for irrigation. Overall, the technologies of the future will, in the words of Ausubel, be "cleaner, leaner, lighter, and drier"--that is, more efficient and less wasteful of materials and water. They will be much more tightly integrated through microprocessor-based control and will therefore use human and natural resources much more efficiently and productively. Energy intensity, land intensity, and water intensity (and, to a lesser extent, materials intensity) for both manufacturing and agriculture are already heading downward. Only in agriculture are they falling fast enough to offset the surge in population, but, optimistically, advances in science and technology should accelerate the downward trends in other sectors, helping to decouple economic development from environmental impact in the coming century. One positive sign is the fact that recycling rates in North America are now approaching 65% for steel, lead, and copper and 30% for aluminum and paper. A second sign is that economic output is shifting away from resource-intensive products toward knowledge-based, immaterial goods and services. As a result, although the U.S. gross domestic product (GDP) increased 200-fold (in real dollars) in the twentieth century, the physical weight of our annual output remains the same as it was in 1900. If anything, this trend will be accelerating. As Kevin Kelly, the editor of Wired magazine, noted, "The creations most in demand from the United States [as exports] have lost 50% of their physical weight per dollar of value in only six years.... Within a generation, two at most, the number of people working in honest-to-goodness manufacturing jobs will be no more than the number of farmers on the land--less than a few percent. Far more than we realize, the network economy is pulling us all in." Even pollution shows clear signs of being decoupled from population and economic growth. Economist Paul Portney notes that, with the exception of greenhouse gases, "in the OECD [Organization for Economic Cooperation and Development] countries, the favorable experience [with pollution control] has been a triumph of technology That is, the ratio of pollution per unit of GDP has fallen fast enough in the developed world to offset the increase in both GDP per capita and the growing number of 'capitas' themselves." The fourth opportunity for science and technology stems from their enormous potential to unlock resources not now available, to reduce human limitations, to create new options for policymakers and businesspeople alike, and to give us new levels of insight into future challenges. Technically resources have little value if we cannot unlock them for practical use. With technology, we are able to bring dormant resources to life. For example, it was only with the development of an electrolytic process late in the nineteenth century that aluminum--the most abundant metal on earth--became commercially available and useful. Chemistry unlocked hydrocarbons. And engineering allowed us to extract and put to diverse use untapped petroleum and gas fields. Over the course of history, technology has made the inaccessible accessible, and resource depletion has been more of a catalyst for change than a longstanding problem. Technology provides us with last-ditch methods (what economists would call substitutions) that allow us to circumvent or leapfrog over crises of our own making. Agricultural technology solved the food crisis of the first half of the nineteenth century. The English "steam crisis" of the 1860s, triggered by the rapid rise of coal-burning steam engines and locomotives, was averted by mechanized mining and the discovery and use of petroleum. The U.S. "timber crisis" that Teddy Roosevelt publicly worried about was circumvented by the use of chemicals that enabled a billion or so railroad ties to last for decades instead of years. The great "manure crisis" of the same era was solved by the automobile, which in a few decades replaced some 25 million horses and freed up 40 million hectares (100 million acres) of farmland, not to mention improving the sanitation and smell of inner cities. Oil discoveries in Texas and then in the Middle East pushed the pending oil crisis of the 1920s into the future. And the energy crisis of the 1970s stimulated the development of new sensing and drilling technology, sparked the advance of non--fossil fuel alternatives, and deepened the penetration of electricity with its fuel flexibility into the global economy. Thanks to underground imaging technology, today's known gas resources are an order of magnitude greater than the resources known 20 years ago, and new reserves continue to be discovered. Technology has also greatly extended human limits. It has given each of us a productive capability greater than that of 150 workers in 1800, for example, and has conveniently put the power of hundreds of horses in our garages. In recent decades, it has extended our voice and our reach, allowing us to easily send our words, ideas, images, and money around the world at the speed of light. But global sustainability is not inevitable. In spite of the tremendous promise that technology holds for a sustainable future, there is the potential for all of this to backfire before the job can be done. There are disturbing indications that people sometimes turn in fear and anger on technologies, industries, and institutions that openly foster an ever-faster pace of change. The current opposition to nuclear power genetically altered food, the globalization of the economy and the spread of American culture should give us pause. Technology has always presented a two-edged sword, serving as both cause and effect, solving one problem while creating another that was unintended and often unforeseen. We solved the manure crisis, but automotive smog, congestion, and urban sprawl took its place. We cleaned and transformed the cities with all-electric buildings rising thousands of feet into the sky. But while urban pollution was thereby dramatically reduced, a portion of the pollution was shifted to someone else's sky. "Limits to growth" was a popular theme in the 1970s, and a best-selling book of that name predicted dire consequences for the human race by the end of the century. In fact, we have done much better than those predictions, largely because of a factor the book missed--the potential of new technology to break limits. Repeatedly, human societies have approached seemingly insurmountable barriers only to find the means and tools to break through. This ability has now become a source of optimism, an article of faith, in many parts of the world. Today's perceived limits, however, look and feel different. They are global in nature, multicultural, and larger in scale and complexity than ever before. Nearly 2 billion people in the world are without adequate sanitation, and nearly as many are without access to clean drinking water. AIDS is spreading rapidly in the regions of the world least able to fight it. Atmospheric concentrations of greenhouse gases are more than 30% greater than preindustrial levels and are climbing steadily. Petroleum reserves, expected to be tapped by over a billion automobiles worldwide by 2015, may last only another 50-100 years. And without careful preservation efforts, the biodiversity of the planet could become as threatened in this coming century as it was at the end of the last ice age, when more than 70% of the species of large mammals and other vertebrates in North America disappeared (along with 29% in Europe and 86% in Australia). All these perceived limits require innovation of a scope and intensity surpassing humankind's current commitment. The list of real-world problems that could thwart global sustainability is long and sobering. It includes war, disease, famine, political and religious turmoil, despotism, entrenched poverty, illiteracy, resource depletion, and environmental degradation. Technology can help resolve some of these issues--poverty and disease, resource depletion, and environmental impact, for example--but it offers little recourse for the passions and politics that divide the world. The likelihood is that we will not catch up and overtake the moving target of global sustainability in the coming century, but given the prospects for technology, which have never been brighter, we may come surprisingly close. We should put our technology to work, striving to lift more than 5 billion people out of poverty while preventing irreversible damage to the biosphere and irreversible loss of the earth's natural resources. We cannot see the future of technology any more clearly than our forebears did--and for much the same reason. We are approaching the threshold of profound change, moving at great speed across a wide spectrum of technology, ranging today from the Internet to the Human Genome project. Technology in the twenty-first century will be turning toward biological and ecological analogs, toward microminiature machines, toward the construction of materials atom by atom, and toward the dispersion of microprocessor intelligence into everyday objects subsequently linked into neural networks. Computing power continues to double every 18 months, as postulated in Moore's law, promising to enable us to create much more powerful tools for everyday tasks, optimize business services and processes along new lines, understand complex natural phenomena like the weather and climate, and design technical systems that are self-diagnostic, self-healing, and self-learning. The networked, digital society of the future should be capable of exponential progress more in tune with biological models of growth than with the incremental progress of industrial societies. If history tells us anything, it is that in the long term we are much more likely to underestimate technology than to overestimate it. We are not unlike the excited crowds that in 1909 tried to imagine the future of flight as they watched Wilbur Wright loop his biplane twice around the Statue of Liberty and head back to Manhattan at the record-breaking speed of 30 miles per hour. As wild as one's imagination and enthusiasm might have been, it would have been inconceivable that exactly 60 years later humans would fly to the moon and back.

#### Growth is sustainable – technological advances prove

William J Baumol, professor of economics at NYU, Robert E. Litan, Senior Fellow of Economic Studies at the Brookings Institute, and Carl J. Schramm, President and chief executive officer of the Kauffman Foundation,” 2007, Good Capitalism, Bad Capitalism, and the Economics of Growth and Prosperity

One line of skepticism about growth arises from individuals and groups who worry that as the world’s population increases and economic growth continues, societies will use up scarce resources and, at the same time, degrade the environment. In the early 1970s, a group called the “Club of Rome” expressed such worries, fearing that eventually (and rather soon) the world would run out of energy and some commodities, so that growth couldn’t continue at anything like the existing pace. Today, there are those who believe, for similar reasons, that growth shouldn’t continue. The doomsayers who projected that economic growth would come to a standstill were wrong. Since 1975, total world economic output has increased more than sevenfold.2 On a per capita basis, world output is more than five times higher than it was thirty years ago. Growth in output, and therefore income, per person throughout the world advanced at a far more rapid pace (nearly ninefold) in the twentieth century than in any other century during the previous one thousand years (to the extent these things can be measured).3 Per capita output continues to increase because firms around the world continue to make more use of machines and information technology that enable workers to be more productive and because technology itself continues to advance, making it possible for consumers to use new products and services. There is good reason to hope that this process can and will continue, though there are some lurking dangers, including foolish actions by governments. But should growth continue? What about the supplies of energy that will be depleted in the process or the pollution that will be generated as ever more things are produced and used? Curiously, economists who tend to be quite rational in their lives urge the worriers to have faith—faith that continued technological progress powered by market incentives will ease these concerns. As it turns out, however, economists’ faith has roots in historical fact. In the early 1800s, Thomas R. Malthus famously predicted that the world’s population would eventually starve or, at the least, live at a minimal level of subsistence because food production could not keep pace with the growth of population. Technological advances since that time have proved him wrong. Through better farming techniques, the invention of new farming equipment, and continuing advances in agricultural science (especially the recent “green revolution” led by genetic engineering), food production has increased much more rapidly than population, so much so that in “real terms” (after adjusting for inflation), the price of food is much lower today than it was two hundred years ago, or for that matter, even fifty years ago. Farmers, who once accounted for more than 0 percent of the population at the dawn of the twentieth century in the United States, now comprise less than a percent of population—and are able to grow far more food at the same time.

#### Collapse isn’t coming now – their ev is old and talking about collapses that proved resilient

#### Growth prevents all shortage problems – and its self-regulating.

Michael Zey, professor at the School of Business Administration at Montclair University and executive director of the Expansionary Institute and internationally recognized expert on the economy, society and management, as well as author. Seizing the Future, 1998 p185-87

In fact, perhaps the time has arrived for the species to reconsider the very concept of density altogether. The Macroindustrial society’s stu­pendous ability to construct artificial islands, underground cities and city-buildings, obliterates timeworn and obsolete notions of “popula­tion” density in much the same way that skyscrapers rewrote earlier concepts of overcrowding. In fact, when people want more land, it is within their ability to go out and create it. Israelis are reclaiming the Negev Desert through the use of hydroponics, the agricultural tech­nique that recycles all water and nutrients, is nonpolluting, and needs little land and no soil at all. Holland has been reclaiming land from the sea for centuries. Between 1951 and 1971, India’s total cultivated land acreage in­creased by 20 percent. In fact, it would surprise most Westerners bom­barded with dire media predictions about that country’s fate to discover that India is not now densely populated. Measured by the number of persons per acre of arable land, Japan and Taiwan, neither of which can be considered suffering from malnourishment, are about five times as densely populated as India. So it would seem that the argument that a growing population will outdistance the supply of food, materials, and energy cannot withstand empirical scrutiny. Nonetheless advocates of zero growth periodically revive such alarmist arguments, exploiting fears harbored deep inside the human psyche since the dawn of the human species: mass starva­tion, drought, and ecological Armageddon. The arguments can be safely ignored. The world population, which at present stands at about 5 billion persons, will peak over the next century and a half at around twice that. What conditions must prevail for a population to add another 5 billion individuals to its ranks? For one, its members must be sufficiently healthy to reach puberty, must be physically resilient enough to bear healthy children, and must re­main in good health to care for the children and to produce goods and services to support this next generation. In a sense, the zero-growth advocates have turned the argument on its head to produce a concept that is ultimately illogical. How could a starving, unhealthy, disease-ridden society, which we supposedly will become if we keep increasing our population, even sustain itself to double in size? Such societal breakdowns—famine, drought, and plague—are the very factors that prevented humanity from reaching any sizable population level until A.D. 1800, after 30,000-plus years of attempted expansion. In other words, our expansion from 5 billion to 11 billion, instead of being a harbinger of shortages and deterioration, will be proof positive that the Macroindustrial revolution has delivered what it promised—a healthy, well-fed, technologically advanced global society that supports 5 billion more people than lived on the planet at the era’s inception! In truth, the decision to consider the newborn child as a mouth to feed instead of a being whose brain will contribute to the world’s knowl­edge and whose hands will help build the universe more reflects the observer’s own prejudices and pessimism than any reality we know. From the above, it is obvious that the technological breakthroughs and material improvements of the Macroindustrial Era will sustain a much larger population. § Marked 18:14 § At the same time, that growing population will contribute the labor and creativity necessary to support the continued progress of the species. As we have seen, these advances in the agricultural, energy, and materials fields demonstrate the species’ ability to overcome the restrictions of nature and to recast the concept of limits and boundlessness. The implications of these advances are many. We can finally see the light at the end of the tunnel in terms of eliminating hunger and malnutrition from the face of the planet.

#### Natural Gas is still cheaper and more attractive than renewables

Christopher F. Jones, Phd, professor at US Berkeley with research focusing on energy and the environment, 8-29-2012, Huffington Post, “Natural Gas: Bridge or Dead End?”, http://www.huffingtonpost.com/christopher-f-jones/bridge-or-dead-end\_b\_1837015.html

Building a natural gas bridge will require a significant expansion of infrastructure: drilling wells for production, pipelines for distribution, and a range of devices for consumption including power plants, home furnaces, and industrial ovens. Investing in these systems will increase the supply of natural gas and lower its costs through economies of scale. As a result, consumers will find it cheaper and easier to use natural gas. This is a straightforward account of what infrastructure does -- it facilitates certain types of behaviors. What is less appreciated is the fact that infrastructure cuts two ways. These systems will not simply provide an advantage for natural gas; they will make it progressively harder and more expensive to transition to renewables. We can examine this point by thinking about relative prices and sunk costs. Relative prices often matter more than absolute prices for energy transitions. For consumers, it is not simply the price of an energy source that matters; it is how much more or less that energy source costs than other options. Right now, natural gas is already cheaper than solar and wind for electricity production in most analyses. With significant investments in natural gas infrastructure, this price gap is only likely to grow. Therefore, even though the absolute price of renewable energy will not change, wind and solar will become less attractive to consumers because they will cost relatively more. What's more, these inequalities are likely to become more extreme over time due to sunk costs. Most of the systems designed to burn natural gas, like furnaces and electrical generating equipment, are expensive and designed to last for decades. Once large sums have been paid to purchase such systems, short-term price changes matter far less to consumers. Even if natural gas triples in price, prior investments in these systems will still act as a disincentive for switching to renewables. The sunk costs in infrastructure, therefore, further suggest that once we get on the bridge, it will be hard to get off.

#### No impact – nuclear is carbon neutral and solves methane which is the only warming impact

### Env

#### Tech and markets solve ecological destruction

Jonathan H. Adler, Professor of Law and Director of the Center for Business Law and Regulation at Case Western Reserve University School of Law, Fall 2008, “Green Bride to Nowhere,” The New Atlantis, http://www.thenewatlantis.com/publications/green-bridge-to-nowhere

According to Speth, “most environmental deterioration is a result of systemic failures of capitalism.” This is an odd claim, as the least capitalist nations of the world also have the worst environmental records. The ecological costs of economic statism are far worse than those of economic liberty. The environmental record of the various Soviet regimes amply bears this out: The West’s ecological nightmares were the Soviet bloc’s environmental realities. This is not due to any anomaly of the Soviet system. Nations with greater commitment to capitalist institutions experience greater environmental performance. While Speth occasionally acknowledges pockets of environmental progress, he hardly stops to consider the reasons why some environmental resources have been conserved more effectively than others. Fisheries are certainly declining throughout much of the world—some 75 percent of fisheries are fully or over-exploited—but not everywhere. It is worth asking why. Tropical forests in less-developed nations are declining even as most temperate forests in industrialized nations are rebounding. Recognizing these different trends and identifying the key variables is essential to diagnosing the real causes of environmental deterioration and prescribing a treatment that will work. Speth acknowledges that much of the world is undergoing “dematerialization,” such that economic growth far outpaces increases in resource demand, but seems not to appreciate how the capitalist system he decries creates the incentives that drive this trend. Were it not for market-driven advances in technological capability and ecological efficiency, humanity’s footprint on the Earth would be far greater. While modern civilization has developed the means to effect massive ecological transformations, it has also found ways to produce wealth while leaving more of the natural world intact. Market competition generates substantial incentives to do more with less—thus in market economies we see long and continuing improvements in productive efficiency. This can be seen everywhere from the replacement of copper with fiber optics (made from silica, the chief component in sand) and the light-weighting of packaging to the explosion of agricultural productivity and improvements in energy efficiency. Less material is used and disposed of, reducing overall environmental impacts from productive activity. The key to such improvements is the same set of institutional arrangements that Speth so decries: property rights and voluntary exchange protected by the rule of law—that is, capitalism. As research by Wheaton College economist Seth Norton and many others has shown, societies in which property rights and economic freedoms are protected experience superior economic and environmental performance than those societies subject to greater government control. Indeed, such institutions have a greater effect on environmental performance than the other factors, such as population growth, that occupy the attention of Speth and so many other environmental thinkers. Speth complains that capitalism is fundamentally biased against the future; but the marketplace does a far better job of pricing and accounting for future interests than the political alternative. “Future generations cannot participate in capitalism’s markets [today],” says Speth. Fair enough, but they cannot vote or engage in the regulatory process either. Thus the relevant policy question is what set of institutions does the best—or least bad—job of accounting for such concerns, and here there is no contest. However present-oriented the marketplace may be, it is better able to look past the next election cycle than any plausibly democratic alternative. Speth pays lip service to the virtues of markets, but he still calls for a replacement of the capitalist system with something else. He acknowledges that “no better system of allocating scarce resources has yet been invented” than capitalism, and yet can’t seem to grasp why. He tries to define and dissect the nature of capitalist economics, but is unable to distill its essence. Quoting neo-Marxist critiques is not a likely path to enlightenment about the market economy. Insofar as firms in the marketplace seek to “externalize” the costs of economic activity (such as by polluting) or “rent seek” to receive special benefits from government, they are seeking to escape the market discipline fostered by capitalist economics, rather than participate in it. Voluntary exchange of private rights is central to the market process. When firms obtain goods or services, such as natural resources or waste disposal, without contracting for them, firms are acting outside of the market process and free from market discipline. If the goal is to “internalize” the environmental effects of economic activity, the most fruitful course is to expand market institutions, rather than impose additional layers of political controls.

#### Kuznets curve means growth saves the environment

John Tierney, science columnist for the New York Times, journalism degree from Yale U, cites Nobel Prize winning economist Simon Kuznets, Ph.D from Columbia U, 4-20-2009, [tierneylab.blogs.nytimes.com/2009/04/20/the-richer-is-greener-curve/

In my Findings column, I explain how researchers have discovered that, over the long term, being richer often translates into being greener. Many environmental problems get worse as a country first industrializes, but once it reaches a certain level of income, the trend often reverses, producing a curve shaped like an upside-down U. It’s called a Kuznets curve (in honor of the economist Simon Kuznets, who detected this pattern in trends of income inequality). As promised in the column, here are some graphic examples of Kuznets curves for sulphur dioxide pollution, as measured in an assortment of rich and poor countries, and also as measured over time in the United States. Each line is an environmental Kuznets curve for a group of countries during the 1980s. The levels of sulphur dioxide pollution (the vertical axis) rise as countries becomes more affluent (the horizontal axis). But then, once countries reach an economic turning point (a gross domestic product close to $8,000 per capita), the trend reverses and air pollution declines as countries get richer. In this analysis by Xiang Dong Qin of Clemson University, the green line shows countries with strong protections for property rights; the red curve shows countries with weaker protections. I’m not trying to argue that all environmental problems fit these curves, or that these improvements happen automatically. How fast the environment improves depends not just on money but on whether a country has an effective government, educated citizens, healthy institutions and the right laws. (For discussions of the variability of these curves and the factors that affect them, see this PERC report by a group led by Bruce Yandle of Clemson University and this article in Environment, Development and Sustainability by Kuheli Dutt of Northeastern University.) But rising incomes can make it more likely that improvements will come, and these Kuznets curves give more reason for optimism than the old idea that economic growth endangered the planet. In the 1970s, rich countries were urged to “de-develop” by Paul Ehrlich and John P. Holdren, now the White House science adviser. I welcome your thoughts on what can be learned from Kuznets curves — and whether people at opposite ends of the curves can find common ground. As America got richer in the the 20th century, emissions of sulphur dioxide rose. But thanks to new technologies, new laws and new desires for cleaner air, the trend reversed, and sulphur-dioxide pollution declined even though population and wealth kept rising.

### War

#### Growth key to interdependence – solves all wars.

Valentin Krustev, Department of Political Science at Rice University, 2006, “Interdependence and the Duration of Militarized Conflict,” Journal of Peace Research, sage

According to the opportunity-cost argument, interdependence promotes peace by raising the costs of militarized conflict (Polachek, 1980; Polachek, Robst & Chang, 1999). Conflict becomes more costly, in turn, because the fighting parties, in addition to bearing the costs of waging warfare, forfeit the potential gains from trading, owing to government-imposed restrictions and increased business risks. However, these conflict-inhibiting effects of interdependence are not limited only to the pre-conflict phase of a dispute, and the opportunity-cost argument can explain how the prospect of further trade losses provides incentives for conflict termination as well. As some scholars have observed, any theory of the effect of interdependence on conflict should be grounded in a solid understanding of the occurrence and dynamic of conflict itself (Morrow, 1999, 2003; Gartzke, 2003b). While traditionally multiple theories of conflict have proliferated in the study of IR, recent scholarship has drawn attention to its informational origins (Fearon, 1995; Gartzke, 1999). As Fearon (1995) argues, if most conflicts end in some negotiated settlement over the disputed issue, rational states should prefer to conclude that settlement prior to incurring the conflict costs, as the bargaining range of mutually acceptable settlements is guaranteed to be non-empty when these costs are positive. A very common reason for states sometimes being unable to reach a rational pre-conflict settlement emerges in the asymmetry of information, combined with states’ incentives to misrepresent their reservation values. Conflict, on the other hand, helps states to credibly communicate these reservation values by demonstrating their willingness to incur its costs or revealing the true magnitude of the costs, as an expanding informational literature on war suggests (e.g. Wagner, 2000; Filson & Werner, 2002; Slantchev, 2003). The opportunity-cost logic implies that interdependence can enter the theoretical framework outlined above through the conflict-cost parameters, as interdependence increases these costs. Following Fearon’s (1995) discussion, higher conflict costs increase the pre-conflict bargaining range and should, therefore, decrease the probability of conflict. In their calculus, states balance the size of their demands against the probability that these demands exceed the opponent’s reservation value and are rejected. Higher conflict costs due to greater interdependence worsen states’ conflict payoffs and push them to lower their demands, which, in turn, results in a reduced probability of conflict onset.8 Signaling arguments, on the other hand, suggest that interdependence allows states to credibly communicate their resolve or reservation values by severing an advantageous economic relationship that an unresolved state would not terminate. The credible communication made possible by interdependence reduces the uncertainty existing over the bargaining range and increases the likelihood of a settlement short of war (e.g. Gartzke, 2003a,b; Morrow, 2003). Thus, if we adopt Fearon’s (1997) terminology, signaling implies that interdependence allows states to ‘sink costs’, while the opportunitycost logic is more reminiscent of ‘tying hands’; that is, interdependence affects states’ behavior by changing their incentives. The opportunity-cost argument for why interdependence inhibits militarized conflict can be easily extended to account for the effect of interdependence on the duration of conflict. If interdependence raises the opportunity costs of conflict prior to its onset, then these costs should also remain high after onset, because, at least in the short term when firms have not permanently reoriented their business operations, they will gain if hostilities cease and normal trade with the adversary is restored. Then, just as the higher prospective costs of conflict push states to lower their demands and avert conflict prior to its onset, so do these higher prospective costs push states to settle early, even if conflict has not fully served its informational purpose and states might be forfeiting the better deal they can get if they know more. That is, the purpose of militarized conflict is to overcome asymmetric information, but conflict costs are the price states have to pay to extract that information. The higher these costs are due to interdependence, the more expensive the information-revelation process is, and the sooner are states likely to settle on unfavorable terms rather than continue fighting.

#### Growth solves violence

John A. Tures, Associate Professor of Political Science at LaGrange College, 2003, “ECONOMIC FREEDOM AND CONFLICT REDUCTION: EVIDENCE FROM THE 1970S, 1980S, AND 1990S”, Cato Journal, Vol. 22, No. 3. http://www.cato.org/pubs/journal/cj22n3/cj22n3-9.pdf

The last three decades have witnessed an unprecedented expansion of market-based reforms and the profusion of economic freedom in the international system. This shift in economic policy has sparked a debate about whether free markets are superior to state controls. Numerous studies have compared the neoliberal and statist policies on issues of production capacity, economic growth, commercial volumes, and egalitarianism. An overlooked research agenda, however, is the relationship between levels of economic freedom and violence within countries. Proponents of the statist approach might note that a strong government can bend the market to its will, directing activity toward policies necessary to achieve greater levels of gross domestic product and growth. By extracting more resources for the economy, a powerful state can redistribute benefits to keep the populace happy. Higher taxes can also pay for an army and police force that intimidate people. Such governments range from command economies of totalitarian systems to autocratic dictators and military juntas. Other economically unfree systems include some of the authoritarian “Asian tigers.” A combination of historical evidence, modern theorists, and statistical findings, however, has indicated that a reduced role for the state in regulating economic transactions is associated with a decrease in internal conflicts. Countries where the government dominates the commercial realm experience an increase in the level of domestic violence. Scholars have traced the history of revolutions to explain the relationship between statism and internal upheavals. Contemporary authors also posit a relationship between economic liberty and peace. Statistical tests show a strong connection between economic freedom and conflict reduction during the past three decades.

## 2AC States

### 2AC States CP

#### Perm do both – shields the link

#### Perm do the counterplan

#### Federal action is key – Scott says sends signal to investors

#### Federal action is key to getting skin in the game – reassures investors prohibitive regulations won’t get slapped on

Rod Adams, Publisher of Atomic insights. Was in the Navy for 33 years. Spent time at the Naval Academy. Has experience designing and running small nuclear plants, 1-29-2010, “Concrete Action to Follow Strongly Supportive Words On Building New Nuclear Power Plants,” Atomic Insights, http://atomicinsights.com/2010/01/concrete-action-to-follow-strongly-supportive-words-on-building-new-nuclear-power-plants.html

Loan guarantees are important to the nuclear industry because the currently available models are large, capital intensive projects that need a stable regulatory and financial environment. The projects can be financed because they will produce a regular stream of income that can service the debt and still provide a profit, but that is only true if the banks are assured that the government will not step in at an inopportune time to halt progress and slow down the revenue generation part of the project. Bankers do not forget history or losses very easily; they want to make sure that government decisions like those that halted Shoreham, Barnwell’s recycling facility or the Clinch River Breeder Reactor program are not going to be repeated this time around. For the multi-billion dollar projects being proposed, bankers demand the reassurance that comes when the government is officially supportive and has some “skin in the game” that makes frivolous bureaucratic decisions to erect barriers very expensive for the agency that makes that decision. I have reviewed the conditions established for the guarantee programs pretty carefully – at one time, my company (Adams Atomic Engines, Inc.) was considering filing an application. The loan conditions are strict and do a good job of protecting government interests. They were not appropriate for a tiny company, but I can see where a large company would have less trouble complying with the rules and conditions. The conditions do allow low or no cost intervention in the case of negligence or safety issues, but they put the government on the hook for delays that come from bad bureaucratic decision making.

#### Federal credit is key to keep loans low cost – low interest rates and diverse portfolios

John Griffith, Policy Analyst with the Economic Policy Team at the Center for American Progress, and Richard Caperton, Director of Clean Energy Investment at the Center for American Progressed, 5-3-2012, “Major Analysis: Federal Loans And Loan Guarantees Have A Huge Benefit But A Low And Predicatable Cost,” ThinkProgress, http://thinkprogress.org/climate/2012/05/03/475978/major-analysis-federal-loans-and-loan-guarantees-have-a-huge-benefit-but-a-low-and-predicatable-cost/?mobile=nc

The federal government is in a unique position to issue these loans and guarantees for several reasons. First, the government can borrow money at a much lower rate than any private firm, meaning they can usually charge lower rates when lending for public purposes. Second, the government can spread risk unlike any private financial institution, both across long time periods and a diverse credit portfolio that spans housing, education, agriculture, infrastructure, international development, and several other industries. This diversification limits taxpayer exposure to drastic swings from year to year or booms and busts in any individual market. Third, the government has the unmatched ability to limit risks by regulating markets and ensuring compliance from lenders and borrowers.

#### Federal credit is key to keep loans low-risk

Karl Smith, Assistant Professor of Public Economics at University of North Carolina Chapel Hill, 4-12-2012, “In Praise of Federal Loan Guarantees (Yep, Just Like Solyndra's)” The Atlantic, http://www.theatlantic.com/business/archive/2012/04/in-praise-of-federal-loan-guarantees-yep-just-like-solyndras/255721/

We may or may not question the wisdom of the federal government attempting to shape the future of US energy, rigging the game in favor of US manufactures, or pushing marginal college students to load up on debt. However, if we are going to do these things, it's important to recognize that loan guarantees are among the cheapest ways to do them. Why? Well, for one the United States has an incredibly low cost of credit. Lower in fact than any private organization on earth. If there were some way to handle the inevitable political corruption, it would make sense for the US government to act as a giant bank. Indeed, by using ever-rising debt to support unusually low tax rates, the US government does to a degree act as a bank. By offering its good name to guarantee other lending ventures the government forgoes the revenues of a bank but provides much of the same service. It allows projects to be entered into which the principals could not afford alone. This does expose taxpayers to risk. However, because of very unique features of the US government, it's especially low risk. For most lending institutions, the hardest risks to cover are high-beta risks. These are risks which swing wildly with the economy. For example, I might loan money to a natural gas generator manufacturer and to a solar power manufacturer. One of these two technologies is likely to dominate but I am not sure which one. However, because I have loaned to both I have protected myself somewhat. Yet, if the entire economy tanks and no power companies can raise money to add generation capacity of any kind, then I am screwed on both fronts. I can limit my exposure to the specific sector risks, but I can't limit my exposure to the entire economy. The Federal Government is a bit different. The cost of borrowing money for the Federal government tanks exactly when the economy tanks. It is a negative beta borrower. That implies that precisely when things are at their worst, government credit is at its best. So rather than facing terrible losses and the possibility of bankruptcy, as would a normal lending institution, the Federal Government has an easier time than ever.

#### States obviously still link to the election – they get perceived the same as the feds

#### 50 state fiat is a voting issue – the damage has been done

#### Multiple actors make it impossible to generate offense

#### It’s utopian – 50 states have never operated together – that kills T spec edu

#### Single-state CPs solve all their offense

#### Feds have to take the lead – boosts our expertise and means countries consult us on their nuclear decisions – that’s Domenici and Miller

## 2AC Ban Incentives

### 2AC Ban Incentives CP

#### Perm do both

#### Perm do the counterplan

#### Perm do the plan and eliminate all other financial incentives for energy production

#### The solvency contention is offense against this CP – cost of capital means nuclear is impossible absent loan guarantees

#### Their evdiecne assumes zero subsidies not zero NUCLEAR subsidies – they make it much more disadvantageous to build nuclear

#### Their solvency evidence is not remotely sufficient to remedy billion dollar nuclear plants – it’s talking about small-scale renewables innovation

#### Banning incentives causes economic collapse

Paul Sullivan, professor of economics at National Defense University, 3-12-2012, “Dynamically Consider the Tradeoffs” National Journal, We are still in a fragile economy. Is this the best time to score some political points with part of the base at the cost of American jobs? I don’t think so.

There should be serious analyses of the potential first, second and third order effects of any subsidies to any energy source. Often the analyses start and stop at simple static, one-dimensional analyses presented by lobbyists and others who are trotted before Congress. Often subsidy issues are, like this overall question, focusing on one subsidy or other separately.¶ Proper analyses of energy subsidies will take into account the overall energy system and the distortions that will be created by increasing or decreasing present subsidies or creating new ones. Most people when they think of subsidies in economic terms they think in terms of shifting supply and demand curves and that ends it. However, the real economics of subsidies is far more complex than the Economics 101 versions that pass for full studies.¶ Subsidies have dynamic qualities and involve sometimes very complex feedback mechanisms. Take for example the pet subsidy idea now being bandied about in Washington: cut all subsidies to oil and gas.¶ Given the political risks the oil markets face in the Middle East, West Africa and beyond this does not seem the right sort of time to cut tax breaks for oil and gas companies to a large extent. Also, this seems rather odd given that one of the political kicking bags these days is the absurd notion that we have expensive gasoline. We don’t, but let’s face it most people in the country think we do even if we do not.¶ So let’s follow this through. Let’s cut back on some potential tax breaks to oil exploration and production. That would tend to bring less oil on line. Now let’s cut back on any potential tax breaks to oil refineries. That would tend to make gasoline more expensive not less. Add in the increased costs to oil exploration and production to the increased costs to refining and we get, voila, even higher gasoline prices.¶ Now, lets’ get to the higher order effects can we? If we effectively increase the costs to oil exploration, production, and refining then diesel prices will also likely increase. When diesel prices increase then we have increased transport costs for food, furniture, medicines, and all of the every day things people need. That sounds like government induced inflation to me. This is really not the right time to do this, now is it?¶ Increasing the costs of transport fuels, and about 96 percent of our transport fuels are oil based, will tend to weaken the employment markets. Companies large and small will have to pay more for fuel and will have less left over for hiring people or improving capital, machines and the like. We are still in a fragile economy. Is this the best time to score some political points with part of the base at the cost of American jobs? I don’t think so.

#### Obviously links to politics – huge lobbies

David Roberts, energy and politics specialist, 1-8-2011, “Is it politically realistic to eliminate energy subsidies?” Grist, http://grist.org/article/2011-01-07-is-eliminating-energy-subsidies-politically-realistic/

Basically, Leonard asks, “if you care about the deficit, shouldn’t you support cutting pointless subsidies to wealthy energy incumbents?” To which the answer is, they don’t care about the deficit, and they do care about wealthy energy incumbents, so, um, no.¶ As evidence that the tide is turning, Leonard cites Al Gore and Republican Sens. Jim DeMint (S.C.) and Tom Coburn (Okla.) questioning corn ethanol subsidies. And it’s true that the politics of corn ethanol subsidies do seem to be shifting slightly, though not to the point that anyone’s actually, you know, doing anything about them. It’s also true that Obama’s budget proposed a modest rollback of (some) oil subsidies — but even that prompted furious blowback from Republicans.¶ To sum up: Nobody but nobody in politics is going to cut subsidies to a favored constituency out of concern over the deficit. And one or two people saying something reasonable while nothing at all happens does not exactly constitute a “new political moment.”¶ A more substantive problem with the idea of rolling back all energy subsidies has to do with the durability of such a reform over time. Earlier this year I read a fascinating book by political scientist Eric Patashnik called Reforms at Risk: What Happens After Major Policy Changes Are Enacted. It’s about the aftermath of political reforms — which ones endure and which don’t, and why.¶ One of the chapters is on the Tax Reform Act of 1986, which radically simplified the tax code, eliminating dozens of loopholes and shelters. It was somewhat of a miracle that it happened at all; the rules of political gravity seemed to undergo a strange inversion. But what happened afterward? As Patashnik documents, political gravity reasserted itself, various powerful constituencies came back to the trough, and over time the tax code returned to its former complexity. The reform didn’t stick because it didn’t change anything structural — all the same incentives were in place afterward.¶ I fear any sweeping “Subsidy Reform Act” would meet the same fate. Energy companies have huge incentive to seek tax favors; politicians have huge incentive to grant them. It’s hard to see how that basic structural situation is going to change, and if it doesn’t, subsidies that are eliminated are likely to creep back in over time.

#### Doesn’t solve repository

IPFM, International Panel on Fissile Materials, September 2011, “Managing Spent Fuel from Nuclear Power Reactors Experience and Lessons from Around the World,” IPFM, http://fissilematerials.org/library/rr10.pdf

When all long-lived waste streams are taken into account, it appears that reprocessing may not reduce the size of a radioactive waste repository dramatically. ANDRA, France’s radioactive waste management agency, has estimated the repository tunnels for the radioactive waste generated by its reprocessing and plutonium recycle activities will underlie about 15 square kilometers of surface area.18 This is about the same area that would have been required had France not reprocessed at all.19 Thus, reprocessing does not reduce the political challenges to repository siting. This is illustrated by the impasses over repository siting in Japan and the United Kingdom. In contrast, Sweden and Finland, the countries that are most advanced in the repository siting process, do not reprocess their spent fuel.

#### Takes too long and not economical

IPFM, International Panel on Fissile Materials, September 2011, “Managing Spent Fuel from Nuclear Power Reactors Experience and Lessons from Around the World,” IPFM, http://fissilematerials.org/library/rr10.pdf

Advocates of reprocessing today argue that it can ease the technical and political problems of radioactive waste disposal by allowing most of the plutonium and other longlived transuranic elements to be recycled. According to a comprehensive study by the U.S. National Research Council published in 1996, however, even with repeated recycle and fissioning of the transuranics in fast-neutron reactors, it “would take about two centuries … to reduce the inventory of the [transuranics] to about 1% of the inventory of the reference LWR once-through fuel cycle.”17 The study also concluded that this would be extraordinarily costly.

#### Geologic storage solves waste

Charles Ferguson, president of the Federation of American Scientists, November 2011, “JAPAN MELTED DOWN. BUT THAT DOESN'T MEAN THE END OF THE ATOMIC AGE,” Foreign Policy issue 189, EBSCO

NUCLEAR WASTE IS a solvable problem, as long as you get the technology and the politics right -- and in that order. Radioactive materials can be kept from contaminating land and water supplies for tens of thousands of years if you bury them in the right geological formation, such as stable granite rock, or for at least a century if you put them in dry storage casks (a course that presumably offers enough time for scientists to figure out a more permanent solution). Germany's Morsleben facility, in a former rock-salt mine, has housed nuclear waste safely for three decades; at the Surry Power Station in Virginia, the cask method has worked without incident for a quarter-century.

#### Reprocessing causes prolif

James Acton, Carnegie Endowment for International Peace, 10-12-2010, “Evidence to the Blue Ribbon Commission on America’s Nuclear Future,” Carnegie, http://carnegieendowment.org/files/BRC\_acton\_testimony.pdf

To understand why a US decision to reprocess might encourage others to do likewise, it is necessary to realize that states decide to procure sensitive nuclear technologies for reasons other than cold, hard economic analyses demonstrating that a fuel cycle choice would lower electricity costs—or even that it would provide other essentially economic benefits such as energy security or simplified radioactive waste disposal. The decision-making of states is more complicated. They can be strongly affected by non-economic factors including prestige and, what I term, received wisdom. § Marked 18:17 § The role of prestige in nuclear technology procurement decisions is well known and I don’t think I need to labour the point. The role of received wisdom is less well recognized. Received wisdom is the assumed belief, based on the actions of other states, that a fuel cycle technology is beneficial. Received wisdom, especially from the United States but also from the United Kingdom, explains why, prior to the mid 1970s, every state with a nuclear power programme outside the Soviet bloc (apart from Canada) planned to reprocess spent fuel. Few, if any, of these states surveyed uranium resources to assess their scarcity or made detailed estimates of the cost of nuclear electricity from fast reactors. They simply copied the US and the UK. Indeed, when the United States changed its policy and opposed reprocessing in 1976, Japanese diplomats repeatedly complained that ‘our belief in the necessity of the plutonium cycle is based on American teaching’. My concern, therefore, is that an American decision to reprocess would create received wisdom that plutonium separation was the way to go; that it would confer prestige on reprocessing technology and, hence, encourage other states to start separating plutonium.

#### Breeders link to politics – proliferation fears

Tom Blees, president of the Science Council for Global Initiatives and board member for the Global Energ Prize, 2008, “Newclear Power,” Prescription for the Planet, page 125

Which brings us to one likely reason why fast reactor technology has been ignored all these years. Because fast reactors are capable of creating more fissile material than they burn, they are known as breeder reactors. And because breeder reactors create plutonium, they have been a special target of anties and politicians concerned about proliferation. As in so many issues having to do with nuclear power technology, most of the resistance is due to ignorance of the technology and a generalized fear of all things nuclear.

### Accidents

### 2AC Nuclear Expertise – Deterrence

#### New US nuclear power demand causes nuclear expertise revival

APS (American Physical Society), Report from the APS Panel on Public Affairs Committee on Energy and Environment, June 2008, Readiness of the U.S. Nuclear Workforce for 21st Century Challenges, http://www.aps.org/policy/reports/popa-reports/upload/Nuclear-Readiness-Report-FINAL-2.pdf

The 21st century has brought a growing realization that it is time to reexamine the adequacy of the U.S. nuclear workforce and its ability to deal with many old and new challenges our nation faces. This report draws attention to critical shortages in the U.S. nuclear workforce and to problems in maintaining relevant educational modalities and facilities for training new people. This workforce comprises nuclear engineers, nuclear chemists, radiochemists, health physicists, nuclear physicists, nuclear technicians, and those from related disciplines. As a group they play critical roles in the nation’s nuclear power industry, in its nuclear weapons complex, in its defense against nuclear and other forms of terrorism, and in several aspects of healthcare, industrial processing, and occupational health and safety. Each of these areas presents significantly more dramatic challenges than it did not very many years ago. Each is an important aspect of our national security. Nuclear Power: Past and Present Workforce shortages in the arena of commercial nuclear power, and the problem of maintaining modernized training facilities, mainly stem from the 30-year stasis in U.S. demand for new civilian nuclear power plants1. The number of operating civilian nuclear reactors in the U.S. has remained at about 100 during this time. Thus, U.S. vendors have been forced to look abroad for sales. Some have either ceased construction of new reactors entirely or else significantly scaled back business in this area. Their continuing, largely static, nuclear engineering workforce needs have been met through a combination of hiring those trained in university nuclear engineering programs and retraining others whose original expertise was in some other field (usually mechanical engineering). Retirees from the nuclear Navy also have played an important role. A natural result of this stasis was for many years a greatly reduced interest among undergraduates in nuclear science and engineering programs2. In turn, this put great pressure on U.S. universities to scale back in these areas. Recently, however, the Federal government, through the Department of Energy (DOE), dramatically increased funding for these educational efforts. This played a major role in increasing undergraduate student enrollments in nuclear engineering from a low point of 480 in 1999 to 1,933 in 2007. Declaring the problem to be solved, DOE called for the termination of its university nuclear science and engineering programs for FY 2007. Congress in turn provided reduced funding for FY 2007 and transferred all the programs except reactor fuel services to the Nuclear Regulatory Commission (NRC) for FY 2008. These “feast or famine” gyrations have led to significant instabilities: the number of university nuclear engineering departments has decreased from 66 in the early 1980s to 30 today, and the number of university reactors has dwindled from 63 to 25 during essentially the same period.

#### Key to credible nuclear deterrence

John C. Browne et al, Los Alamos National Laboratory (retired), Clark Murdock, Center for Strategic and International Studies, Francis Slakey, American Physical Society, Benn Tannenbaum, American Association for the Advancement of Science, Jessica Yeats, Center for Strategic and International Studies, December 2008, Nuclear Weapons in 21st Century U.S. National Security, http://csis.org/files/media/csis/pubs/081208\_nuclear\_weapons\_report.pdf

To maintain a credible nuclear deterrent, the United States should sustain the necessary human capital: as much of the existing workforce ages, experience, expertise and competence will likely decline across the nuclear enterprise including the Department of Defense (DOD), Department of Energy (DOE), and the military services. A broader mission for the nuclear weapons labs that addresses energy security as well as nuclear security interests can help recruit, retain, and sustain highly skilled and motivated scientists and engineers.

#### Loss of U.S. nuclear primacy causes global nuclear war

John P Caves, Senior Research Fellow in the Center for the Study of Weapons of Mass Destruction at the National Defense University, January 2010, Strategic Forum, No. 252, “Avoiding a Crisis of Confidence in the U.S. Nuclear Deterrent,”

Perceptions of a compromised U.S. nuclear deterrent as described above would have profound policy implications, particularly if they emerge at a time when a nuclear-armed great power is pursuing a more aggressive strategy toward U.S. allies and partners in its region in a bid to enhance its regional and global clout. A dangerous period of vulnerability would open for the United States and those nations that depend on U.S. protection while the United States attempted to rectify the problems with its nuclear forces. As it would take more than a decade for the United States to produce new nuclear weapons, ensuing events could preclude a return to anything like the status quo ante. The assertive, nuclear-armed great power, and other major adversaries, could be willing to challenge U.S. interests more directly in the expectation that the United States would be less prepared to threaten or deliver a military response that could lead to direct conflict. They will want to keep the United States from reclaiming its earlier power position. Allies and partners who have relied upon explicit or implicit assurances of U.S. nuclear protection as a foundation of their security could lose faith in those assurances. They could compensate by accommodating U.S. rivals, especially in the short term, or acquiring their own nuclear deterrents, which in most cases could be accomplished only over the mid- to long term. A more nuclear world would likely ensue over a period of years. Important U.S. interests could be compromised or abandoned, or a major war could occur as adversaries and/or the United States miscalculate new boundaries of deterrence and provocation. At worst, war could lead to state-on-state employment of weapons of mass destruction (WMD) on a scale far more catastrophic than what nuclear-armed terrorists alone could inflict.

## 2AC Obama Good

### 2AC Elections – Obama Good

#### Romney up in the key states

Susan Page, for USA Today, 10-15-2012, “Swing States poll: Women push Romney into lead,” USA Today, http://www.usatoday.com/story/news/politics/2012/10/15/swing-states-poll-women-voters-romney-obama/1634791/

9:06PM EDT October 15. 2012 - WASHINGTON — Mitt Romney leads President Obama by four percentage points among likely voters in the nation's top battlegrounds, a USA TODAY/Gallup Poll finds, and he has growing enthusiasm among women to thank. As the presidential campaign heads into its final weeks, the survey of voters in 12 crucial swing states finds female voters much more engaged in the election and increasingly concerned about the deficit and debt issues that favor Romney. The Republican nominee has pulled within one point of the president among women who are likely voters, 48%-49%, and leads by 8 points among men.

#### Romney’s surging with women – they’re key

Susan Page, for USA Today, 10-15-2012, “Swing States poll: Women push Romney into lead,” USA Today, http://www.usatoday.com/story/news/politics/2012/10/15/swing-states-poll-women-voters-romney-obama/1634791/

The battle for women, which was apparent in the speakers spotlighted at both political conventions this summer, is likely to help define messages the candidates deliver at the presidential debate Tuesday night and in the TV ads they air during the final 21 days of the campaign. As a group, women tend to start paying attention to election contests later and remain more open to persuasion by the candidates and their ads. That makes women, especially blue-collar "waitress moms" whose families have been hard-hit by the nation's economic woes, the quintessential swing voters in 2012's close race. "In every poll, we've seen a major surge among women in favorability for Romney" since his strong performance in the first debate, veteran Democratic pollster Celinda Lake says. "Women went into the debate actively disliking Romney, and they came out thinking he might understand their lives and might be able to get something done for them." While Lake believes Obama retains an edge among women voters, the changed views of Romney could be "a precursor to movement" to the Republican candidate, she says. "It opens them up to take a second look, and that's the danger for Obama." Female voters are a critical part of the president's coalition. Four years ago, he led Republican rival John McCain by a single point among men, according to surveys of voters as they left polling places. The decisive Democratic margin of victory came from women, who supported Obama by 13 points. Now, the USA TODAY/Gallup Poll shows Romney leading Obama 50%-46% among likely voters in the swing states. Men who are likely voters back him 52%-44%. The states are Colorado, Florida, Iowa, Michigan, Nevada, New Hampshire, New Mexico, North Carolina, Ohio, Pennsylvania, Virginia and Wisconsin.

#### Wisconsin key – Romney’s surging

William Galston, election editor for TNR, 10-15-2012, “Why Wisconsin Could Be the Key to a Romney Victory,” The New Republic, Why Wisconsin Could Be the Key to a Romney Victory, http://www.tnr.com/blog/plank/108578/why-wisconsin-could-be-the-key-romney-victory

Which brings us to Wisconsin, the only state that Romney’s surge has truly moved into the swing category. Not only have the post-debate surveys shown Obama’s margin down to 2 points, but also, the same survey that gave Obama a 52 percent approval rating in Virginia put him at 47 in Wisconsin. History suggests that if vice-presidential candidates matter anywhere, it’s in their home states. If I were Romney’s campaign manager, I would tell Ryan to spend most of the next three weeks—morning, noon, and night—visiting every city, town, and hamlet in Wisconsin. And if my internal polls had Obama’s margin down to (say) one point with three or four days until the election, I would schedule one or two big Romney rallies to maximize enthusiasm and turnout. Wisconsin matters because it could reduce the pressure on Romney to draw to an inside straight. Carrying Wisconsin wouldn’t fully compensate for losing Ohio, of course. But added to Romney’s base of 235 electoral votes, Wisconsin plus Virginia would bring him to 258, at which point Colorado plus any one of the three smallest swing states--New Hampshire, Iowa, Nevada-- would put him over the top. So would winning Iowa and Nevada, even without Colorado. By the same token, while carrying Wisconsin wouldn’t quite compensate for losing Virginia, winning Ohio plus Wisconsin would give Romney 263 electoral votes, at which point either Colorado or any two of the remaining smaller states would yield victory.

#### Romney’s surging on favorable and Obama’s crashing

Andrew Sullivan, editor in chief of the Daily Dish and noted writer for Newsweek, The New Republic, and The Atlantic, 10-19-2012, “Romney's Net Favorables Now Exceed Obama's,” The Daily Dish, http://andrewsullivan.thedailybeast.com/2012/10/romneys-net-favorables-now-exceed-obamas.html

It increasingly seems clear to me that the first debate's impact on Romney's personal image may be its most enduring legacy. One of Romney's clear disadvantages in this race is that the president was for a long time basically liked much more than Romney and the Obama campaign's spring and summer offensive on his record and image helped widen this gap. It's now gone entirely. Here are Romney's favorable ratings with no heightened sensitivity, from June to now. Red is unfavorable; black is favorable: Just look at that pivot. The Convention failed to move the needle, but some time in late September, a rise began, perhaps as Republicans came home and just decided they could like the guy. But then the big turning point is Romney's first debate, when he effectively undid in one night almost everything the Obama campaign had thrown at him since the spring. It was a new market; he had a new sales pitch; a new set of policies; a personality implant. And for many low-information voters, and others, that was enough. Now, look, alas, at what has happened to the president in the same period of time in the same poll of polls: Obama's net favorability is now + 2 points. Romney's net favorability is now + 4.7. If you try and see the very latest twists and heighten sensitivity, Obama is actually in net unfavorable territory (- 2) while Romney is + 0.2. I cannot see much to encourage the Obama campaign in these numbers. Since mid-September, the country has clearly soured on the president personally a little, and gotten to like Mitt more. More to the point, you can't blame the first debate. The shift began in mid-September - but then accelerated after the first debate. That may explain why that debate moved so much. Voters had been coming around to Romney already and he then confirmed those voters' sentiments in the debate and they moved en masse. At least that's my best guess. We have yet to see any real impact from the second debate. But Obama has only ever had net unfavorables for a brief period after the debt ceiling fiasco in the summer of 2011. It's not a good sign when the biggest movement upward in your unfavorables in your entire term is in October of your re-election year. Let's just hope that his new stump speech boosting the recovery gets the rebound we need. In the Electoral College vote, here's what Princeton has right now:

### Russia

#### Romney wont tank relations – will shift to reconciliation

Eugene Ivanov, political commentator, 10-19-2011, “Mitt Romney: The no-apology candidate,” Russia Beyond the Headline, http://rbth.ru/articles/2011/10/19/mitt\_romney\_the\_no-apology\_candidate\_13598.html

It would be premature, however, to conclude that Romney’s current position vis-à-vis Russia, hostile as it may appear, will necessarily translate into explicit anti-Russian policies of his prospective presidency. Romney’s self-proclaimed status as the major Republican opponent to President Obama forces him to use every opportunity to criticize the Obama Administration. While criticizing the White House’s economic policies is easy given the status of U.S. economy, it’s much trickier to challenge Obama’s foreign policy. The fact is that in many respects, the Obama Administration’s current foreign policy discourse isn’t much different from that of his predecessor. And this poses a problem for Romney because his new “American Century” proposal is a slightly disguised version of the George W. Bush Administration’s “us-vs.-them” approach. Obama’s policy of “reset” in U.S.-Russia relations is perhaps the only area where Romney can see a clear deviation from the policies of the Bush era. Romney therefore attacks the “reset” because there is not much else to attack. It remains to be seen whether the newly acquired aggressive streak in Romney’s foreign policy views will eventually prevail, or if he will instead gradually return to the more pragmatic approach he adhered to in 2007. It remains to be seen, too, which effect Romney’s choice of Leon Aron – a prominent Russia expert from the American Enterprise Institute – as his Russia advisor will have on his presidential campaign. It may well happen that at certain point of his presidency, should it materialize, Romney will realize that having Russia as a partner serves American national interests better than having it as a foe. And who knows: Romney may decide to meet with Putin and look into his soul? And make no apology for that.

#### Relations resilient and no risk of war – cold war proves

Richard **Weitz**, staff writer, **9-27**-2011, “Global Insights: Putin not a Game-Changer for U.S.-Russia Ties,” World Politics Review, <http://www.worldpoliticsreview.com/articles/10140/global-insights-putin-not-a-game-changer-for-u-s-russia-ties>

Fifth, **there will inevitably be areas of conflict between Russia and the** **U**nited **S**tates regardless of who is in the Kremlin. **Putin** and his entourage **can never be happy with having NATO be Europe's most powerful security institution**, since Moscow is not a member and cannot become one. Similarly, **the Russians will always object to NATO's missile defense** efforts since they can neither match them nor join them in any meaningful way. In the case of Iran, Russian officials genuinely perceive less of a threat from Tehran than do most Americans, and Russia has more to lose from a cessation of economic ties with Iran -- as well as from an Iranian-Western reconciliation. On the other hand, **these conflicts can be managed**, since **they will likely remain limited and compartmentalized. Russia and the West do not have fundamentally conflicting vital interests of the kind countries would go to war over**. § Marked 18:18 § And **as the Cold War demonstrated, nuclear weapons are a great pacifier under such conditions.** Another novel development is that **Russia is much more integrated into the international economy and global society than the Soviet Union was, and Putin's popularity depends heavily on his economic track record**. Beyond that, **there are objective criteria, such as the smaller size of the Russian population and economy as well as the difficulty of controlling modern means of social communication, that will constrain whoever is in charge of Russia.**

#### Russia relations are resilient-crises are fueled by domestic politics but never cause long term damage

Daragh **McDowell**, Oxford IR doctoral candidate, 8-22-**2011**, “Don't Sweat the Russia 'Reset'”, <http://www.worldpoliticsreview.com/articles/9837/dont-sweat-the-russia-reset>

In recent weeks, pundits, diplomats and assorted **foreign policy wonks** have **started raising the alarm on U.S.-Russia relations,** with the Obama administration's much-trumpeted "reset" seeming to be increasingly under threat. A recent travel ban by the U.S. State Department on certain Russian officials believed to be involved in the death of lawyer Sergei Magnitsky elicited an angry response from Moscow threatening cooperation in areas ranging from Afghanistan to North Korea. Russia's ambassador to NATO, Dmitry Rogozin, has started grousing about U.S. missile defense plans again. And all of this comes against a backdrop of increasing criticism from Prime Minister Vladimir Putin and his factional supporters in the Russian government about U.S. policy in Libya and Syria. Predictably, this has resulted in a stream of op-eds in the Western press raising the specter of a "new Cold War." So is the concern justified? In a word, no. **There has been no** major **break in U.S.-Russian relations, nor is one likely.** What we are seeing is yet another one of Russia's periodic succession crises in the run-up to next year's presidential election. As Russia is in functional terms a nondemocratic state, there is no effective and broadly accepted mechanism for ensuring an orderly transfer of power, and arguably there hasn't been one since the days of the tsar. The selection and installation of a new ruler tends to be a perilous affair for everyone involved. It also tends to make Russian foreign policy highly reactive and aggressive until the crisis passes. To understand why this is, we first need to examine how the Russian regime actually operates. Though the idea has taken hold in much of the Western press that the Russian state can be reduced to Putin, Russia's leadership is actually a collection of various elite interest groups, often referred to as "clans." The role of the national leader is to ensure a rough balance of power among the clans and to keep open conflict from breaking out. This presents an obvious problem when the time comes to change the national leader. Since the new leader must come from within the current elite, he or she will already be a member of an established clan. That raises the risk that the new boss will use his position to benefit his own clan rather than to maintain the balance of power among them all. As the stakes rise, nerves fray and intra-elite conflict becomes more likely. This leads to a more confrontational foreign policy for two key reasons. First, during a domestic crisis, the regime is at its weakest, and as a result it seeks to keep the influence of external actors to an absolute minimum by scaring them away. Think of a cat giving birth: It screeches and howls and spits to scare off other predators, all in an effort to hide the fact that it is momentarily powerless to defend itself. Similarly, during a succession crisis, the Russian Foreign Ministry makes alarming noises in order to put the West on the defensive while the Kremlin sorts out its internal affairs. But there is another and admittedly more worrying reason for this phenomenon. When the clans start to fight one another, there are few restrictions on either the site of battle or the weapons employed. For the siloviki clans -- members and former members of the security services -- in particular, political struggles are often a matter of life and death. Interfering with foreign policy can be a potent weapon: By creating a tense and even hostile international environment, clan members can tilt the scales in favor of conservatism, a hard-line leadership and preservation of the status quo. The last such crisis occurred in 2007, as Putin prepared to make way for President Dmitry Medvedev. At that time, a siloviki war broke out in Russia, leading to several mysterious deaths. Furthermore, the succession crisis is the most plausible explanation for the assassination of Alexander Litvinenko. By this argument, elements in the regime wanted to either display their capabilities for mischief-making to the various leadership contenders or else create a crisis that forced Putin to stay in a position of power. Why else would the Russian security services use polonium to kill Litvinenko, thereby leaving a radioactive trail leading right back to the Kremlin, when they have access to an array of lethal and nearly untraceable poisons? Luckily, the current impasse is more of a mini-crisis. The ruling tandem of Putin and Medvedev has managed to keep a fairly tight rein on power, and the smart money remains on Medvedev remaining as president with Putin continuing as prime minister. There is still an element of uncertainty though. The caricature of Medvedev as "Putin's puppet" has always been inaccurate, and as president Medvedev has gained leverage to push both a foreign and domestic agenda that has discomfited his political opponents. Many hardliners would dearly love to see Medvedev out and Putin back in as unrivaled leader of the Russian political elite. **The next few months will** therefore **be rough** ones **for Russia's relations with the West**. But **when the dust settles** and the official candidate -- and therefore winner -- of the 2012 presidential election becomes clear, **things should settle down** just as quickly as they have recently flared up. In the meantime, Europe and **the U.S. should** try to **react as little as possible** and avoid doing any lasting damage that can't be easily repaired

### Link

#### NRC will issue licenses for large reactors before the election

Mark Peters, deputy laboratory director for programs at Argonne National Laboratory, "The Future of Nuclear Energy," 6-25-2012, http://www.fas.org/blog/pir/2012/06/25/the-future-of-nuclear-energy/

NUCLEAR ENERGY SINCE THE LATE 1970s¶ Although the power of the “peaceful atom” was initially welcomed as a generation source that would provide electricity “too cheap to meter,” the economics of the industry were upended after the oil crisis of 1973-74. With the national economy stagnant and interest rates as high as 20 percent, the cost of building new nuclear capacity spiked from an average of $161/kW in 1968-1971 to $1,373/kW in 1979-84.[1] During the same period, U.S. environmentalists and other opponents of nuclear energy were galvanized by the highly publicized partial core meltdown at the Three Mile Island plant in Pennsylvania, which caused the release of small amounts of radioactive gases. The combination of extraordinary costs and public opposition brought U.S. nuclear power plant construction to a halt. After 1978, no new units were ordered for more than 30 years,[2] although power uprates and license extensions for many existing plants have been granted since then. (Work began recently on preparation for new reactors at the Vogtle nuclear plant site in Georgia; the Nuclear Regulatory Commission (NRC) is expected to issue the combined construction and operating license for the new reactors by the end of this year.)

#### No link – plan doesn’t happen till after the election

David Lightman and William Douglas 9-21-2012, “Unproductive Congress breaks until after November election”, http://www.adn.com/2012/09/20/2633147/unproductive-congress-breaks-until.html\_

Lawmakers spent Thursday pointing fingers and charging opponents with cynical political posturing. Among Congress' last decisions was a characteristic 2012 judgment: Punt action until later. It will let the farm bill, a broad measure that sets the nation's agriculture and food and nutrition assistance policies, expire Sept. 30.¶ Congress also exits without any serious effort to edge away from the "fiscal cliff," the prospect of economy-damaging budget chaos if it doesn't act by year's end. Bush-era tax cuts are due to expire, and automatic spending cuts will take effect unless alternatives are passed.¶ The public is noticing, as the legislative failures stir uncertainty and further roil an already-weak economy. This Congress' approval ratings were stuck at 13 percent in a Gallup survey Sept. 6-9, the lowest the pollster has ever logged this late in an election year since such measurements began in 1974.¶ Yet lawmakers are slinking out of town, after a September session that was on and off for less than two weeks, following a summer recess that ran from Aug. 3 to Sept. 10. Congress is expected to return Nov. 13.

#### Other factors cancel each other out – only the economy matters

Mano Singham, PHD, theoretical physicist and director of UCITE, at U Cleveland, 3-8-2012, “What really matters in predicting presidential election outcomes,” Free Thoughts Blog, http://freethoughtblogs.com/singham/2012/03/08/what-really-matters-in-predicting-presidential-election-outcomes/

A political scientist colleague of mine who tracks these things closely says that what they look at are markers of the state of the economy. The best predictor of presidential elections is the change in real disposable income and the GDP. Since there is usually a six-month lag in these numbers filtering down to voters, the figures that come in starting around May will give us a good indication of which way the election will go in November, largely irrespective of the candidates and the issues. Figures like unemployment do not matter so much because most people are employed and so it does not affect them directly. This seems counterintuitive. Surely the GRAGGS (guns, race, abortion, gays, god, sex) issues that occupy so much time and space and arouse so much passion must influence the way people vote? But apparently they are not very good as predictors. I am guessing here but suspect that it is because most people’s views on these are fixed and thus the debates have little chance of changing the way people vote and merely serve to stoke the intensity of their feelings. And for those who can be swayed, the effects are random and largely cancel each other out, in that for every undecided voter who decides to vote for the Democrat because he or she is disturbed by the contraception uproar, there is likely another who it drives to the Republican camp.

#### Winners win

Robert Creamer, political strategist for over four decades, 12-23-2011, "Why GOP Collapse on the Payroll Tax Could be a Turning Point Moment," Huffington Post, www.huffingtonpost.com/robert-creamer/why-gop-collapse-on-the-p\_b\_1167491.html

2). Strength and victory are enormous political assets. Going into the New Year, they now belong to the President and the Democrats. One of the reasons why the debt ceiling battle inflicted political damage on President Obama is that it made him appear ineffectual - a powerful figure who had been ensnared and held hostage by the Lilliputian pettiness of hundreds of swarming Tea Party ideological zealots. In the last few months -- as he campaigned for the American Jobs Act -- he has shaken free of those bonds. Now voters have just watched James Bond or Indiana Jones escape and turn the tables on his adversary. Great stories are about a protagonist who meets and overcomes a challenge and is victorious. The capitulation of the House Tea Party Republicans is so important because it feels like the beginning of that kind of heroic narrative. Even today most Americans believe that George Bush and the big Wall Street Banks - not by President Obama -- caused the economic crisis. Swing voters have never lost their fondness for the President and don't doubt his sincerity. But they had begun to doubt his effectiveness. They have had increasing doubts that Obama was up to the challenge of leading them back to economic prosperity. The narrative set in motion by the events of the last several weeks could be a turning point in voter perception. It could well begin to convince skeptical voters that Obama is precisely the kind of leader they thought he was back in 2008 - a guy with the ability to lead them out of adversity - a leader with the strength, patience, skill, will and resoluteness to lead them to victory. That now contrasts with the sheer political incompetence of the House Republican Leadership that allowed themselves to be cornered and now find themselves in political disarray. And it certainly contrasts with the political circus we have been watching in the Republican Presidential primary campaign. 3). This victory will inspire the dispirited Democratic base. Inspiration is the feeling of empowerment - the feeling that you are part of something larger than yourself and can personally play a significant role in achieving that goal. It comes from feeling that together you can overcome challenges and win. Nothing will do more to inspire committed Democrats than the sight of their leader -- President Obama - out maneuvering the House Republicans and forcing them into complete capitulation. The events of the last several weeks will send a jolt of electricity through the Progressive community. The right is counting on Progressives to be demoralized and dispirited in the coming election. The President's victory on the payroll tax and unemployment will make it ever more likely that they will be wrong. 4). When you have them on the run, that's the time to chase them. The most important thing about the outcome of the battle over the payroll tax and unemployment is that it shifts the political momentum at a critical time. Momentum is an independent variable in any competitive activity - including politics. In a football or basketball game you can feel the momentum shift. The tide of battle is all about momentum. The same is true in politics. And in politics it is even more important because the "spectators" are also the players - the voters. People follow - and vote -- for winners. The bandwagon effect is enormously important in political decision-making. Human beings like to travel in packs. They like to be at the center of the mainstream. Momentum shifts affect their perceptions of the mainstream. For the last two years, the right wing has been on the offensive. Its Tea Party shock troops took the battle to Democratic Members of Congress. In the Mid-Terms Democrats were routed in district after district. Now the tide has turned. And when the tide turns -when you have them on the run - that's the time to chase them.

#### Public loves nukes

WNA, World Nuclear Association, August 2012, “US Nuclear Power Policy,” http://www.world-nuclear.org/info/inf41\_US\_nuclear\_power\_policy.html

Public opinion regarding nuclear power has generally been fairly positive, and has grown more so as people have had to think about security of energy supplies. Different polls show continuing increase in public opinion favourable to nuclear power in the USA. More than three times as many strongly support nuclear energy than strongly oppose it. Two-thirds of self-described environmentalists favour it. A May 2008 survey (N=2925) by Zogby International showed 67% of Americans favoured building new nuclear power plants, with 46% registering strong support; 23% were opposed10. Asked which kind of power plant they would prefer if it were sited in their community, 43% said nuclear, 26% gas, 8% coal. Men (60%) were more than twice as likely as women (28%) to be supportive of a nuclear power plant. A March 2010 Bisconti-GfK Roper survey showed that strong public support for nuclear energy was being sustained, with 74% in favour of it11. In particular, 87% think nuclear will be important in meeting electricity needs in the years ahead, 87% support licence renewal for nuclear plants, 84% believe utilities should prepare to build more nuclear plants, 72% supported an active federal role in encouraging investment in "energy technology that reduces greenhouse gases", 82% agree that US nuclear plants are safe and secure, 77% would support adding a new reactor at the nearest nuclear plant, and 70% say that USA should definitely build more plants in the future. Only 10% of people said they strongly opposed the use of nuclear energy. In relation to recycling used nuclear fuel, 79% supported this (contra past US policy), and the figure rose to 85% if "a panel of independent experts" recommended it. Although 59% were confident that used reactor fuel could be stored safely at nuclear power plant sites, 81% expressed a strong desire for the federal government to move used nuclear fuel to centralised, secure storage facilities away from the plant sites until a permanent disposal facility is ready. Half of those surveyed considered themselves to be environmentalists. A February 2011 Bisconti-GfK Roper survey showed similar figures, and that 89% of Americans agree that all low-carbon energy sources – including nuclear, hydro and renewable energy – should be taken advantage of to generate electricity while limiting greenhouse gas emissions. Just 10% disagreed. Also some 84% of respondents said that they associate nuclear energy "a lot" or "a little" with reliable electricity; 79% associate nuclear energy with affordable electricity; 79% associate nuclear energy with economic growth and job creation; and 77% associate nuclear energy and clean air.

#### Obama won’t be able to get his agenda

Eleanor Clift, contributing editor for Newsweek, 12-23-2011, “Will a Reelected President Obama Face More Gridlock in 2013?” Newsweek, http://www.thedailybeast.com/articles/2011/12/26/will-a-reelected-president-obama-face-more-gridlock-in-2013.html)

Even if the president wins reelection, he could still be stymied by Republicans in Congress. President Obama may have slightly boosted his reelection chances by outmaneuvering the Republicans on the payroll-tax-cut extension. But after a year of Beltway paralysis, that deal simply preserves the status quo for a mere two months—the latest sign of the capital’s utter dysfunction. So is there any reason to believe that Obama would fare better in a second term? More of the same is not appealing. Yet for Obama to govern with any degree of success, he would need either a big electoral upset—with Democrats regaining the House and maintaining a nominal hold on the Senate—or a chastened Republican Party, newly open to cooperation and willing to set aside the all-or-nothing brinkmanship that has defined its strategy. The prospect of four more years of gridlock while Obama looks on from the sidelines will hardly energize voters already disappointed by the president’s performance. For now, Obama is benefiting by standing apart from an institution whose approval rating is 11 percent, but mastering the legislative process is a big part of the job of being president, and while Obama squeezed major legislation through Congress in his first two years, this last year has been a disaster all around. “Unless Democrats win a big victory in Congress, it’s hard to see how a second term would be any better,” says Jack Pitney, an American-government professor at Claremont McKenna College. “Second terms never are.” Pitney was a congressional staffer on the Republican side in 1985, and finds the aftermath of President Reagan’s reelection instructive. “Even though Reagan had won a huge mandate (carrying 49 states), it didn’t translate into much legislative success, with the important exception of tax reform.” Reagan faced a Democratic House and a Republican Senate, a mirror image of the party divisions that frustrate Obama today. Obama is more likely to win in a squeaker than with a Reagan-sized mandate. “You might say if the election of 2008 didn’t persuade Republicans to go along with the majority, why would a narrow Obama victory in 2012 have a better effect?” asks William Galston, a senior fellow at the Brookings Institution. If the president couldn’t quell fractious lawmakers when he had a 70 percent approval rating and a big electoral mandate, why would he be any more effective in dealing with Congress after a hard-fought reelection campaign in which the GOP has a better than even chance to capture control of the Senate, and keep its hold on the House? Yet in politics, as in life, things rarely turn out as predicted. Unless a major backlash against the GOP restores Democratic primacy in the House and maintains the Democratic Senate, a unified Republican Congress might not be such a bad thing from Obama’s perspective, says Galston. “They would be co-owners of the government, and if they want to get the White House [in 2016] they’ve got to persuade the people they can say yes as well as no.” Given a truly divided government, Galston argues there could be greater cooperation between the Democratic White House and the Republican Congress. That would echo the Clinton presidency when the GOP Congress, led by Speaker Newt Gingrich, served up welfare reform and a balanced budget for Clinton to sign. There is not much incentive now for Obama to be more hands-on with Congress, but in a second term he might want to reconsider his approach. Pietro Nivola, a scholar at Brookings’ Governance Studies Program, compares Obama’s leadership with Woodrow Wilson, another “professor president” with a background as an intellectual who made the transition from academia to politics. Wilson, like Obama, took office after his party had won two back-to-back elections, only to be repudiated in the midterm, with Democrats losing dozens of House seats and, two years later, the majority. The difference between the two men, says Nivola, is that Wilson didn’t fall victim to his own high expectations the way Obama has. Wilson was much more parsimonious, campaigning on a very short list: banking reform, knocking down protectionism, and a tougher approach to antitrust. Obama promised the moon, and while he gets accused of being vague (“hope and change”), his campaign document, “A Blueprint for Change,” is a very long list of things he promised to do, with some, like changing the culture in Washington, proving intractable. Wilson laid down clear markers before every piece of legislation, and he spent time on Capitol Hill in an office set aside for him. “He was in their faces,” says Galston. An avowed Anglophile, Wilson didn’t bother wooing the other party. The Democrats had won with big margins and Wilson operated more like a prime minister, preferring to work with his own party. Obama also won with big margins, but the Brookings study concludes he was overly deferential to Congress, behaving more like “a stakeholder mediating at arm’s length than the chief engineer of the policies he sought.” Obama spent much of his first two years in a futile bid for bipartisanship, asserting himself only at the eleventh hour to rescue legislation, as he did with the health-care bill, while mostly leaving the negotiations to emissaries he would dispatch to Capitol Hill “as though some pearl of legislation might form around them,” says Galston. There won’t be a “Blueprint for Change” heralding a second Obama term. Modesty will be in order as he promises to secure gains and finish the job he started. Whether he will approach Congress differently will depend on the circumstances, and his own reflection on what went right, and what went wrong. A lame-duck session after the election could produce notable results and a bipartisan deal just like the last one, with the expiring Bush tax cuts again at center stage.