**1NC**

**A**

***Aff doesn’t specify an agent, that’s a voting issue for fairness and education:***

***A) Moving target – they can spike out of our disads and counterplans***

***B) Cross x doesn’t check – plan text is key to garnering competition. They were vague anyway***

***Agency discussion vital to energy education***

Laurance **Geri &** David **McNabb 2011**, Laurance (Larry) Geri is a member of the faculty of The Evergreen State College, where he teaches in the Masters Program in Public Administration; David E. McNabb is business administration professor emeritus at Pacific Lutheran University and currently a member of the adjunct faculty of Olympic College; Energy Policy in the U.S.: Politics, Challenges, and Prospects for Change, electronic copy of book, KEL)

**Producing an energy policy** that meets security and environmental criteria **begins with answering these questions: Who has decision-making power in this system of government?** How does the political system acknowledge needs and concerns, and respond to them? **To whom is the government more likely to respond?** **These questions are broader than the narrower workings of the policy process, but are also essential to it**. The huge scale of the United States and its states and limited role of the citizen in a representative democracy leaves the individual citizen capable, in most cases, of little impact on important policy processes at either the state or national levels. Beginning in the 1950s, **political scientist** Robert **Dahl and others** argued for a pluralistic or group model of political decision making. That model **emphasized the competition between groups of relatively equal power in the political arena, and the policy outcomes that result from the bargaining between these groups**. The pluralist model largely ignores the differences in resources and power between groups and the reality that large economic entities, especially corporations, have a considerable advantage in the policy bargaining process. Their ability to control investment and employment gives their requests more weight in Washington and the state capitals, although it may not be enough when voters feel betrayed by the corporate sector, as they have in the aftermath of the financial crash of 2008.

**T**

***A) Nuclear energy production is measured by installed capacity***

**IAEA 8** [International Atomic Energy Agency, “A Newsletter of the Division of Nuclear Power,” Nuclear Power Newsletter, Vol. 5, No. 3, September, <http://www.iaea.org/Resources/Women/pdf/nenp0908.pdf>]

**Energy production of nuclear power** plants is a result of an **installed capacity and effectiveness of its utilization**. In 2007 there was no permanent shutdown, compared to eight in 2006, therefore the installed capacity was driven by investment into construction of new NPPs and into power uprating of existing reactor units. Three new reactors were connected to the grid and one long-term shutdown reactor was reconnected. The total installed capacity of the nuclear industry has risen from 369.8 to 372.2 GW(e) during 2007. Utilization of installed capacity can be measured by the energy availability factor (EAF). It is the percentage of maximum energy generation the plant is ready to supply to the electrical grid to meet its demand.

***For is exclusive***

**Clegg, 95** - J.D., 1981 Yale Law School; the author is vice president and general counsel of the National Legal Center for the Public Interest. (Roger, “Reclaiming The Text of The Takings Clause,” 46 S.C. L. Rev. 531, Summer, lexis)

Even if it made no sense to limit the clause to takings "**for** public use"--and, as discussed below, it might make very good sense--that is the way the clause reads. It is not at all ambiguous. The prepositional phrase simply cannot be read as broadening rather than narrowing the clause's scope. Indeed, a prepositional phrase beginning with "for" appears twice more in the Fifth Amendment, and in both cases there is no doubt that **the phrase is narrowing** the scope of the Amendment. n20

***B) Violation - Production incentives are distinct from R&D***

**Suranovic 10** [Steve, associate professor of economics and international affairs at the George Washington University, PhD in economics from Cornell, International Trade: Theory and Policy, v. 1.0, “8.2 Domestic Production Subsidies,” <http://catalog.flatworldknowledge.com/bookhub/reader/28?e=fwk-61960-ch08_s02>]

Domestic production subsidies are generally used for two main reasons. First, subsidies provide a way of raising the incomes of producers in a particular industry. This is in part why many countries apply production subsidies on agricultural commodities: it raises the incomes of farmers. The second reason to use production subsidies is to stimulate output of a particular good. This might be done because the product is assumed to be critical for national security. This argument is sometimes used to justify subsidies to agricultural goods, as well as steel, motor vehicles, the aerospace industry, and many other products. Countries might also wish to subsidize certain industries if it is believed that the industries are important in stimulating growth of the economy. This is the reason many companies receive research and development (R&D) subsidies. Although **R&D subsidies are not strictly production subsidies**, they can have similar effects.

***C. Vote neg—***

***1. LIMITS—R&D of random energy sources expands the topic to a theoretical number of energy sources—impossible to predict.***

***2. GROUND— futuristic sources spike production bad Das - the only unified neg ground***

**T2**

***A) Fusion is not “nuclear power”:***

**Nuclear Regulatory Commission ’12** (March 29, “Uses of Radiation: Nuclear Power Plants” website, [http://www.nrc.gov/about-nrc/radiation/around-us/uses-radiation.html#npp)](http://www.nrc.gov/about-nrc/radiation/around-us/uses-radiation.html#npp%29)
**Nuclear Power** Plants **Electricity produced by nuclear** [**fission**](http://www.nrc.gov/reading-rm/basic-ref/glossary/fission-fissioning.html) — splitting the [atom](http://www.nrc.gov/reading-rm/basic-ref/glossary/atom.html) — is one of the greatest uses of radiation. As our country becomes a nation of electricity users, we need a reliable, abundant, clean, and affordable source of electricity. We depend on it to give us light, to help us groom and feed ourselves, to keep our homes and businesses running, and to power the many machines we use. As a result, we use about one-third of our energy resources to produce electricity. ¶ Electricity can be produced in many ways — using [generators](http://www.nrc.gov/reading-rm/basic-ref/glossary/turbine-generator-tg.html) powered by the sun, wind, water, coal, oil, gas, **or nuclear fission**. In America, nuclear power plants are the second largest source of electricity (after coal-fired plants) — producing approximately 21 percent of our Nation's electricity.¶ The purpose of a nuclear power plant is **to boil water to produce steam** to power a generator to produce electricity. While nuclear power plants have many similarities to other types of plants that generate electricity, there are some significant differences. With the exception of solar, wind, and hydroelectric plants, power plants (including those that use nuclear fission) boil water to produce steam that spins the propeller-like blades of a [turbine](http://www.nrc.gov/reading-rm/basic-ref/glossary/turbine.html) that turns the shaft of a generator. Inside the generator, coils of wire and magnetic fields interact to create electricity. In these plants, the energy needed to boil water into steam is produced either by burning coal, oil, or gas (fossil fuels) in a furnace, or by splitting atoms of [uranium](http://www.nrc.gov/reading-rm/basic-ref/glossary/uranium.html) in a nuclear power plant. Nothing is burned or exploded in a nuclear power plant. Rather, the uranium fuel generates heat through a process called [fission](http://www.nrc.gov/reading-rm/basic-ref/glossary/fission-fissioning.html).

***B) Vote Neg:***

***1) Precision***
**McDonald**, senior officer IAEA Department of Nuclear Energy, **'06** (Alan, International Atomic Energy Agency “Nuclear Energy 'Pros and Cons'”, IAEA InfoLog, January 2006, [http://www.iaea.org/blog/Infolog/?page\_id=47)](http://www.iaea.org/blog/Infolog/?page_id=47%29)

Nuclear power may have a longer or shorter run than, say, coal as an important energy source for the world, but eventually it will also be overtaken by something newer and better. That may be the renewables were familiar with today like wind and solar, **or it might be fusion**, or something arising from nanotechnology or genetic engineering, **or something that were not even doing research on today**. As the former Saudi oil minister used to say, The Stone Age didnt end because people ran out of stones. His point was that the oil age will end before the world runs out of oil, and I believe that the nuclear age, to the extent there is one that deserves a label, will end before we run out of uranium or space for waste dumps. Governments should be encouraged to continue research for both nuclear power and renewables, as well as for carbon capture and storage, nanotechnology, genetic engineering and all the rest.

***2) Limits and ground – fusion is a separate literature base justifies spin off advantages and adds a new energy source***

**CP 1**

***The United States federal government should not shut down Alcator C-Mod. The United States federal government should not pass the 2013 budget for domestic nuclear fusion research & development. The United States federal government should maintain current funding levels established in the 2012 budget for domestic magnetic fusion energy research, including funding for Alcator C-Mod.***

***The current budget is sufficient --- cuts are the key issue***

**Styles 12**

Geoffrey Styles is Managing Director of GSW Strategy Group, LLC, an energy and environmental strategy consulting firm. Since 2002 he has served as a consultant and advisor, helping organizations and executives address systems-level challenges. His industry experience includes 22 years at Texaco Inc., culminating in a senior position on Texaco's leadership team for strategy development, focused on the global refining, marketing, transportation and alternative energy businesses, and global issues such as climate change. Previously he held senior positions in alliance management, planning, supply & distribution, and risk management. He also served on NASA's Senior Management Oversight Committee for Space Solar Power. He earned an M.B.A from the University of California, Berkeley and a B.S. in Chemical Engineering from U.C. Davis. His "Energy Outlook" blog has been quoted frequently by the Wall Street Journal and was named one of the "Top 50 Eco Blogs" by the Times of London in 2008. June 28, 2012, The Energy Collective, Does All-of-the-Above Energy Include Long Shots?, <http://theenergycollective.com/geoffrey-styles/88258/does-all-above-energy-include-long-shots>, jj

Overall, **the DOE has budgeted** just under **$400 million for fusion R&D** in fiscal 2013, out of a total budget request of $27 billion. **That's not insignificant, and devoting 1.5% of the federal energy budget to fusion might be about the right proportion for such a long-term endeavor that is decades from deployment, relative to funding for medium-term efforts like advanced fission reactors and near-term R&D on renewables and efficiency. The problem is that DOE is cutting deeply into US fusion capabilities**, not just at Princeton but also at Lawrence Berkeley Laboratory, Livermore, Los Alamos and Sandia, in order to boost US funding for ITER from $105 million to $150 million next year. Only the fusion budgets for Oak Ridge Laboratory, which is managing the US role in ITER, and for the D.C. HQ grew.

**CP 2**

***The Fifty States should substantially increase grants targeted exclusively toward generation of fusion energy at Alcator C-Mod. The States will limit their role exclusively to funding. All other operations, including appropriation of federal funds, should continue to be the responsibility of the Department of Energy.***

***The counterplan solves clean energy R & D and is legitimate***

Kathleen **Sebelius** and the Securing a Clean Energy Future Task Force, Former Governor of Kansas, Securing a Clean Energy Future, A Report for the National Governors Association as part of the Securing a Clean Energy Future Initiative, 20**08**, http://www.nga.org/files/live/sites/NGA/files/pdf/0807ENERGYRD.PDF

Despite the many benefits of clean energy industries, the question still arises: **Why should state governments play a role in clean** **energy research and development**? **Should that be the role of the federal government** or of private industry? There is no single answer to this question. **There are** some **aspects of clean energy RD&D on which states are ideally situated to act** (discussed later in this report) and other areas that may best be left to private industry or the national government. Below are some of the general advantages of carrying out clean energy RD&D at the state level. **States know their own resources Each state has an opportunity and a role to play in the** clean energy **economy**, both for the nation as a whole to make the best use of its resources and for states to make the most of the opportunities given to them. **States with abundant** clean **energy resources**, such as wind or solar, **can benefit from helping to commercialize the technology to utilize these resources**. Even in the absence of natural resources, states with a strong knowledge-based economy are positioned to contribute to clean energy technology development. **By recognizing their unique strengths and needs when it comes to energy policy, states can set their own** **clean energy** **RD&D priorities and, in so doing, reap the greatest benefits for their individual economies. States can act as policy laboratories States have already become energy innovators by introducing a range of policies and programs that can be replicated in other states or at the regional or national level in support of clean energy.** **They have the ability to pursue a range of options that best fit their state’s natural resources, industrial and technological base, and available funding**. California’s Global Warming Solutions Act provides a prime example (Box 2). **Technology development and policy do not always follow a steady path, but can present opportunities for action. States have the agility to take advantage of those windows**. 9 States can take advantage of unrealized opportunities **Over the past few decades there has been a trend away from investment in energy technology—both by the federal government and by the private sector**, which largely follows the federal lead. 14,15,16 Today, the United States invests about $1 billion less in energy RD&D annually than it did a decade ago**. The decline is pervasive**; it is seen across almost every energy technology category and at multiple stages in the innovation process. Moreover, this decline has occurred while overall U.S. RD&D has grown by 6 percent per year. **The upside is that there is a wealth of opportunities that can be captured by quick and effective state action**. For example, because of the lack of strong federal drivers, the U.S. clean energy industry lags Europe and Asia in terms of export capacity. However, **states can significantly impact this with local industry development and are poised to profit from exporting to a global community rapidly deploying low carbon energy systems.** Countries such as Germany, Spain, and Denmark, which are global leaders in the development and construction of wind turbines, are already realizing this profit. They have multiyear waiting lists for foreign orders. **Every state has an abundance of resources that can be harnessed in support of** clean **energy industries,** from sunlight and fertile soil to advanced manufacturing industries to skilled workforces. For states to implement a successful RD&D strategy, they must identify and objectively assess their resources, with a focus on those that offer the greatest returns or a competitive advantage over other states or regions. While in some cases states can effectively develop expertise in new areas, RD&D strategy should be based first and foremost on the state’s indigenous strengths. **The unique combination of resources in each state argues for pursuing** clean **energy** RD&D **at the state level**. **States are in the best position to assess their resources and craft policy to support the most promising opportunities, in ways that national policies or market forces may not.** The resources that are most relevant to clean energy RD&D are natural resources, industrial resources, and intellectual resources. This section will discuss how states can best use their resources in each of these categories.

**DA**

***Immigration will pass --- Obama has the upper hand and PC is key***

**Boston Herald 2/18**, Obama pressures GOP with own immigration plan, <http://bostonherald.com/news_opinion/us_politics/2013/02/obama_pressures_gop_with_own_immigration_plan>, jj

President **Obama upped the ante on the immigration reform showdown with Republicans, vowing to present his own bill to Congress if the GOP refuses to compromise — a move hailed by political pundits and reform advocates as a savvy maneuver** to keep the backing of crucial Latino voters.

“**As the election showed, the Democrats have their boot on the neck of the Republicans**,” said Maurice Cunningham of the University of Massachusetts Boston. “**Why let up?”**

A bipartisan group of eight lawmakers has been working on an immigration plan for the past few weeks. Yesterday, White House Chief of Staff Denis McDonough warned those lawmakers their time is limited.

“We will be prepared with our own plan if these ongoing talks between Republicans and Democrats up on Capitol Hill break down,” McDonough said in one of several interviews on Sunday talk shows after news of the president’s alternative plan leaked.

The administration’s proposal would create a visa for those in the country illegally and allow them to become legal permanent residents within eight years. The proposal also requires businesses to know the immigration status of their workers and adds more funding for border security.

It drew immediate criticism from U.S. Sen. Marco Rubio (R-Fla.), one of the eight lawmakers on the immigration panel. “If actually proposed, the president’s bill would be dead on arrival in Congress,” Rubio said.

Local activist groups yesterday praised Obama.

“It’s a good day. **It shows leadership and it shows he’s really trying to provide leadership**,” said Eva A. Millona, head of the Massachusetts Immigration and Refugee Advocacy Coalition. “But **we’re optimistic both parties are serious to get this done.”**

**The president is seizing on a key moment**, agreed Alejandra St. Guillen, executive director of Oiste, a Latino civic education organization.

“I don’t know what other option he had,” St. Guillen said. “**Right after the election we had Republicans talking about immigration reform. In a sense, the White House might have thought this was the right time.”**

***Increased fusion spending saps capital***

**Chameides 12**  Bill is the Dean of Duke University’s School of the Environment. “Fusion: Maybe Less Than 30 Years, But This Year Unlikely,” 10/8, <http://www.huffingtonpost.com/bill-chameides/fusion-maybe-less-than-30_b_1949573.html>

But by July 19, 2012, **the fusion bubble was burst**. An external review (pdf) of NIF by the National Nuclear Security Administration presented a mixed bag of praise -- "NIF has demonstrated an 'unprecedented level of quality and accomplishment'" -- and circumspection -- "considerable hurdles must be overcome to reach ignition ... [G]iven the unknowns with the present ...approach, the probability of ignition before the end of December is extremely low."¶ Bad Timing¶ Just so happens that LIFE's funding was to run out at the end of this fiscal year, which fell on September 30. Perhaps that's why the fusion researchers were so publicly sanguine about having results by the end of 2012. So now the scientists hand off this energy holy grail to the politicians, transforming, at least for the time being, a scientific quest into a **political football**, or, you might say fusing the scientific and the political. What should Congress do? Scrap the project or double down? Just another spending issue poised on the fiscal cliff our **folks on the Hill will have to wrestle with.**

***Immigration reform expands skilled labor --- key to India relations***

**L**os **A**ngeles **Times**, 11/9/20**12** (Other countries eagerly await U.S. immigration reform, p. <http://latimesblogs.latimes.com/world_now/2012/11/us-immigration-reform-eagerly-awaited-by-source-countries.html>)

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

***Relations check Indo Pak nuke war***

**Dugger, ’02** (Celia “Wider Military Ties With India Offer U.S. Diplomatic Leverage”, NYT, http://www.nytimes.com/2002/06/10/world/wider-military-ties-with-india-offer-us-diplomatic-leverage.html, 6/10)

Military cooperation between India and the United States has remarkably quickened since Sept. 11, with a burst of navy, air force and army joint exercises, the revival of American military sales to India and a blur of high-level visits by generals and admirals. The fledgling relationship between American and Indian military leaders will be important to Mr. Rumsfeld in talks intended to put to rest fears of war between India and Pakistan. ''We can hope this translates into some influence and trust, though I don't want to overstate it,'' a senior American defense official said in an interview on Thursday. ''I don't want to predict this guarantees success.'' The American diplomatic efforts yielded their first real gains on Saturday when India welcomed a pledge by Pakistan's military ruler to stop permanently the infiltration of militants into Kashmir. India indicated that it would soon take steps to reduce tensions, but a million troops are still fully mobilized along the border -- a situation likely to persist for months -- and the process of resolving the crisis has just begun. India has linked the killing of civilians in Kashmir to a Pakistan-backed insurgency there and has presented its confrontation with Pakistan as part of the global campaign against terrorism. India itself made an unstinting offer of support to the United States after Sept. 11, and Washington responded by ending the sanctions placed on India after its 1998 nuclear tests. With that, the estrangement that prevailed between the world's two largest democracies during the cold war, when India drew close to the Soviet Union and the United States allied with Pakistan, has eased. India, for decades a champion of nonalignment, seeks warmer ties with the United States in hopes of gaining access to sophisticated military technology and help in dealing with Pakistan. From the start of President Bush's term, some influential officials in his administration saw India as a potential counterweight to that other Asian behemoth, China, whose growing power was seen as a potential strategic threat. But since Sept. 11, the priority has been terrorism. The United States is hoping its deeper military and political ties with India will give it some measure of leverage to prevent a war between India and Pakistan that could lead to a nuclear ~~holocaust~~ and would play havoc with the hunt for Al Qaeda in Pakistan.

**Da 2**

***ITER will get necessary funding now***

**Munger**, 7/16/**2012** (Frank, Thom Mason talks about U.s. ITER: ‘When you’re running a project, you’ve got to go full steam ahead’, Atomic City Underground, p. Lexis-Nexis)

**The Obama administration's request for** U.S. **ITER in FY 2013 was $105 million**, and Mason said that's the figure that the U.S. Senate put forward in its appropriation. **The House**, he said, **actually increased the President's budget request to about $140 million** -- the same as this year -- **for 2013**. "So, in terms of the normal appropriations proess, **that means the minimum we would expect is the President's request of $105 (million)**, and depending on what would happen in negotiations (between the House and Senate) it could be a little above that, which would be helpful." Mason said ITER is still subject to the "wildcard of (budget) sequestration" and "that could result in a shortfall, depending on how things play out." **The lab**, however, can't afford to get into the guessing games, so it **is proceeding on the assumption that the ITER funding will be at least at the President's request level**. **"That's our plan, and everything is lining up behind that in terms of procurement actions** and design and so forth," **Mason said. Asked if the U.S. ITER team had delayed** any procurements in anticipation of problems, **Mason said** there were some adjustments made early this year when the President's budget request for FY '13 was released. But since then, **the work has moved forward**, he said.

***Plan crowds out ITER funding --- there’s no budget flexibility or room for new spending***

**Derose 12** (Kimberly, Miliken Scholar, MS in Journalism – USC, AB Physics – Harvard University, and Science Writer – UCLA Office of Media Relations, "Dire Prospects for Domestic Fusion Energy Research", Spring 2012 Money, Markets and Media – USC Annenberg School of Communication, 3-3, http://ascjweb.org/moneymarkets-http://ascjweb.org/moneymarkets media/?p=433, jj)

**Given that the total DOE fusion energy budget for next year is under 400 million, domestic fusion programs may soon be seeing more drastic cuts**. With the government handling a severe budget crisis, **it is safe to say that large funding increases for scientific research are not on the horizon.** **This means that the American ITER contribution will slowly consume the entire domestic budget for fusion research and might even dip into funds intended for high-energy physics experiments.**

***ITER commitment solidifies science diplomacy --- prevents great power conflict and spurs international cooperation.***

**Fedoroff,** 4/2/20**08** (Nina – Ph.D., Science and Technology Adviser to the Secretary of State and the Administration of USAID, Making Science Diplomacy More Effective, Testimony Before the House Science on Research and Science Education, Hearing on Science Diplomacy, p. <http://2001-2009.state.gov/g/stas/2008/105286.htm>)

**Science** by its nature **facilitates diplomacy because it strengthens political relationships, embodies powerful ideals, and creates opportunities for all**. The global scientific community embraces principles Americans cherish: transparency, meritocracy, accountability, the objective evaluation of evidence, and broad and frequently democratic participation. Science is inherently democratic, respecting evidence and truth above all. **Science is** also **a common global language, able to bridge deep political and religious divides**. Scientists share a common language. Scientific interactions serve to keep open lines of communication and cultural understanding. As scientists everywhere have a common evidentiary external reference system, mem**bers of ideologically divergent societies can use the common language of science to cooperatively address** both domestic and the increasingly **trans-national and global problems confronting humanity** in the 21st century. **There is a growing recognition that science and technology will increasingly drive the successful economies of the 21st century**. Science and technology provide an immeasurable benefit to the U.S. by bringing scientists and students here, especially from developing countries, where they see democracy in action, make friends in the international scientific community, become familiar with American technology, and contribute to the U.S. and global economy. For example, in 2005, over 50% of physical science and engineering graduate students and postdoctoral researchers trained in the U.S. have been foreign nationals. Moreover, many foreign-born scientists who were educated and have worked in the U.S. eventually progress in their careers to hold influential positions in ministries and institutions both in this country and in their home countries. They also contribute to U.S. scientific and technologic development: According to the National Science Board’s 2008 Science and Engineering Indicators, 47% of full-time doctoral science and engineering faculty in U.S. research institutions were foreign-born. Finally, **some types of science** – particularly those that address the grand challenges in science and technology – **are inherently international** in scope **and collaborative** by necessity. **The ITER Project**, an international fusion research and development collaboration, is a product of the thaw in superpower relations between Soviet President Mikhail Gorbachev and U.S. President Ronald Reagan. This reactor **will harness the power of nuclear fusion** as a possible new and viable energy source by bringing a star to earth. **ITER serves as a symbol of international scientific cooperation among key scientific leaders in** the developed and developing world – **Japan, Korea, China, E.U., India, Russia, and** United States – representing 70% of the world’s current population. The recent elimination of funding for FY08 U.S. contributions to the ITER project comes at an inopportune time as the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project had entered into force only on October 2007. **The elimination of** the promised **U.S. contribution drew our allies to question our commitment and credibility in international cooperative ventures**. More problematically, **it jeopardizes a platform for reaffirming U.S. relations with key states. It should be noted that even at the height of the cold war, the U**nited **S**tates **used science diplomacy as a means to maintain communications and avoid misunderstanding between the world’s two nuclear powers** – the Soviet Union and the United States. **In a complex multi-polar world**, relations are more challenging, **the threats perhaps greater, and the need for engagement more paramount**.

***Global cooperation prevents multiple scenarios of nuclear war and conflict***

**Zakaria**, 11/29/20**08** (Fareed - editor of Newsweek International, Wanted: A New Grand Strategy, Newsweek, p. lexis)

The "Global Trends" report identifies several worrying aspects of the new international order—competition for resources like oil, food, commodities and water; climate change; continued terrorist threats; and demographic shifts. But the most significant point it makes is that these changes are taking place at every level and at great speed in the global system. Nations with differing political and economic systems are flourishing. Subnational groups, with varied and contradictory agendas, are on the rise. Technology is increasing the pace of change. Such ferment is usually a **recipe for instability**. Sudden shifts can trigger sudden actions—terrorist attacks, secessionist outbreaks, **nuclear brinksmanship**. The likelihood of instability might increase because of the economic crisis. Despite some booms and busts—as well as 9/11 and the wars in Afghanistan and Iraq—the world has been living through an economic golden age. Global growth has been stronger for the past five years than in any comparable period for almost five decades. Average per capita income has risen faster than in any such period in recorded history. But that era is over. The next five years are likely to be marked by slow growth, perhaps even stagnation and retreat, in certain important areas. What will be the political effects of this slowdown? Historically, economic turmoil has been accompanied by social unrest, nationalism and protectionism. We might avoid these dangers, but it is worth being acutely aware of them. At the broadest level, the objective of the **U**nited **S**tates should be to **stabilize the current global order** and to create mechanisms through which change—the rise of new powers, economic turmoil, the challenge of subnational groups like Al Qaeda—can be **accommodated without overturning the international order**. Why? The world as it is organized today powerfully serves America's interests and ideals. The greater the openness of the global system, the better the prospects for trade, commerce, contact, pluralism and liberty. Any strategy that is likely to succeed in today's world will be one that has the active support and participation of many countries. Consider the financial crisis, which several Western governments initially tried to handle on their own. They seemed to forget about globalization—and nothing is more globalized than capital. Belatedly recognizing this, leaders held the G20 meeting in Washington. This was a good first step (though just a first step). Without a coordinated approach, efforts to patch up the system will **fail. The same applies** not just **to** "soft" problems of the future—**pandemics, climate change**—but to current security challenges as well. The problem of multilateralism in Afghanistan—a place where everyone claims to be united in the struggle—is a sad test case for the future. Thirty-seven nations, operating with the blessing of the United Nations and attacking an organization that has brutally killed civilians in dozens of countries, are still unable to succeed. Why? There are many reasons, but it does not help that few countries involved—from our European allies to Pakistan—are genuinely willing to put aside their narrow parochial interests for a broader common one. Terrorism in South Asia generally requires effective multinational cooperation. Business as usual will produce terrorism that will become usual. National rivalries, some will say, are in the nature of international politics. But that's no longer good enough. Without better and more **sustained cooperation**, it is difficult to see how we will solve most of the major problems of the 21st century. The real crisis we face is not one of capitalism or American decline, but of globalization itself. As the problems spill over borders, the demand for common action has gone up. But the institutions and mechanisms to make it happen are in decline. The United Nations, NATO and the European Union are all functioning less effectively than they should be. I hold no brief for any specific institution. The United Nations, especially the Security Council, is flawed and dysfunctional. But we need some institutions for global problem-solving, some mechanisms to coordinate policy. Unless we can find ways to achieve this, we should expect **more crises** and less success at solving them. In a world characterized by change, more and more countries—especially great powers like Russia and China and India—will begin to chart their own course. That in turn will produce **greater instability**. America cannot forever protect every sea lane, broker every deal and fight every terrorist group. Without some mechanisms to solve common problems, the world as we have come to know it, with an open economy and all the social and political benefits of this openness, will flounder and perhaps reverse. Now, these gloomy forecasts are not inevitable. Worst-case scenarios are developed so that they can be prevented. And there are many good signs in the world today. The most significant rising power—China—does not seem to seek to overturn the established order (as have many newly rising powers in the past) but rather to succeed within it. Considerable cooperation takes place every day at the ground level, among a large number of countries, on issues from nuclear nonproliferation to trade policy. Sometimes a crisis provides an opportunity. The Washington G20 meeting, for instance, was an interesting portent of a future "post-American" world. Every previous financial crisis had been handled by the IMF, the World Bank or the G7 (or G8). This time, the emerging nations were fully represented. At the same time, the meeting was held in Washington, and George W. Bush presided. The United States retains a unique role in the emerging world order. It remains the single global power. It has enormous convening, agenda-setting and leadership powers, although they must be properly managed and shared with all the world's major players, old and new, in order to be effective. President-elect Obama has powers of his own, too. I will not exaggerate the importance of a single personality, but Obama has become a global symbol like none I can recall in my lifetime. Were he to go to Tehran, for example, he would probably draw a crowd of millions, far larger than any mullah could dream of. Were his administration to demonstrate in its day-to-day conduct a genuine understanding of other countries' perspectives and an empathy for the aspirations of people around the world, it could change America's reputation in lasting ways. This is a rare moment in history. A **more responsive America**, **better attuned to the rest of the world**, could help create a new set of ideas and institutions—**an architecture of peace** for the 21st century that would bring stability, prosperity and dignity to the lives of billions of people. Ten years from now, the world will have moved on; the rising powers will have become unwilling to accept an agenda conceived in Washington or London or Brussels. But at this time and for this man, there is a unique opportunity to use American power to reshape the world. This is his moment. He should seize it.

**CMOD**

***C-Mod’s useless --- the aff’s money is better spent buying lottery tickets***

**Yost 12**

Keith Yost, STAFF COLUMNIST, The Tech – MIT, Opinion: Good riddance, Alcator C-Mod, 3-6-12, <http://tech.mit.edu/V132/N9/yost.html>, jj

**Good riddance, Alcator C-Mod**

**No one likes to hear that their work is a waste of time and money. But the job of government is not to assuage the egos of research scientists** — the public welfare, writ large, comes first. In a guest column last week, Derek **Sutherland** ’12 **bemoaned a proposed cut to state funding of the Alcator C-Mod reactor at MIT**. I’m sorry Derek, but it needed to be said: **your research was not worthy of the public’s money**, **and** to be frank, was also **not worth your time and attention as a researcher.**

The reason why is simple: **there is no future in magnetically confined fusion power**. **It will never be economical**. We know how large the various layers of a commercial fusion reactor would have to be, and we can estimate the construction materials one would need to create such a reactor. **Even if the very sizable technical hurdles were surmounted — magnetics, plasma physics, materials, and tritium availability to name a few — the capital cost of fusion’s heat island** (the reactor sans turbines and other accouterments), **would still be two to three times greater than that of a conventional fission reactor**, on a per-MW basis. **There is no pot of gold at the end of the long, long fusion research tunnel, and accordingly, little rational motivation to expend the time** of Sutherland and his colleagues (**and** the **money** of the public) **on such a fruitless venture.**

**One could argue that the other features of fusion power — its lack of a waste product, its sustainability, its steady energy generation rate, its relative safety — are compelling enough features to warrant a roll of the dice. I suppose that if one thought the safety issues of nuclear waste could never be resolved, or that the peakiness of wind power might never find an answer, such arguments could be justified**. **These assumptions, however, are overly pessimistic** — **if Derek were to ask his colleagues** in Course 22 **whether the kinks in fission power (safety, waste, uranium availability) could ever be solved, I think he would hear a chorus of resounding “Yes.”** **Nuclear reactors are already quite safe, and next generation plants are even safer.** The **waste is more a political issue than a technological one**. And **uranium is exceedingly abundant** — **if supplies seem short, that’s only because the price has not gone high enough to motivate fresh exploration**. **Certainly, the prospects of mending our existing technologies seem much brighter than the “just give us another 30 years” hope of fusion power.**

**Research like Derek’s is regularly billed as an investment in our future, but the more apt analogy is buying a Powerball ticket**. This is not a sound roll of the dice, **this is a move born out of frustration, desperation, and self-deception**. It **stems from a lack of political will to tackle the policy problems of today’s technology**. **Instead of bringing disparate stakeholders together to settle energy policy issues, we’d much rather cross our fingers and hope for a technological savior to deliver us from the need for political courage.**

The basic premise of economics is scarcity. **If you want to spend resources on fusion, then you must necessarily take them from somewhere else.** We always like to imagine that the resources will be taken from areas we do not like (personally, I would not mind funding fusion if the money somehow came from, say, reality TV). But that is not how such transfers occur — it’s more useful to imagine the resources being diverted in proportion to current levels of spending. **A dollar in fusion comes out of, to varying degrees, education, health care, and, most importantly, other research.**

**Tossing a few billion dollars a year towards fusion does not sound like a lot in these wild days of government check-writing until you remember that MIT as an Institute “only” spends about $2.5 billion a year in its entire operating budget. With the amount the American government spends on fusion research every year, we could finance an entire MIT’s worth of research.**

**The Obama administration’s attempt to do away with Derek’s pet project is an exercise in political courage**, and should be recognized as such. **If the government is going to be productively involved in research and development, it needs to set priorities and draw lines. Fusion, unfortunately, does not make the cut.**

***The US won’t fund quantum computing research – their author***

**Aaronson 8**

(Scott, Associate Professor of Electrical Engineering and Computer Science at MIT, "Quantum Computing and the Ultimate Limits of Computation: The Case for a National Investment," 12-12-08, [http://www.cra.org/ccc/docs/init/Quantum\_Computing.pdf-](http://www.cra.org/ccc/docs/init/Quantum_Computing.pdf-http%3A/www.cra.org/ccc/docs/init/Quantum_Computing.pdf) )

The US has long dominated computing technology. The transistor and integrated circuit

were invented in the US, and Silicon Valley has been the preeminent creator of computing

technologies over the last few decades. It is critical that the US continue to lead with the

computing technologies of the 21st century. **Recently Singapore invested over $100 million**

**in quantum computing research. The Canadian government has contributed over $50**

**million** to the University of Waterloo's Institute for Quantum Computing and the Perimeter

Institute for Theoretical Physics, both of which have become world leaders in quantum

computing and information. **European spending on quantum computing is comparable to**

**that of the US. In short, while the US has funded quantum computing research, it has done**

**so only at a level sufficient enough to barely keep up with the rest of the world.** In some

areas of quantum computing, for instance in the theory of these computers, **the US is being**

**eclipsed by the rest of the world.**

***( ) No cyberterror***

**Knake ’10** (Robert K, international affairs fellow in residence at the Council on Foreign Relations studying cyber war, 2-16, CFR, “Cyberterrorism Hype v. Fact” <http://www.cfr.org/terrorism-and-technology/cyberterrorism-hype-v-fact/p21434>, jj)

While the United States' critical infrastructure, from the electric grid to the financial sector, is vulnerable to attack through cyberspace, **al-Qaeda lacks the capability and motivation to exploit these vulnerabilities**. **To penetrate, map, and damage the networks that control the industrial base requires a large team of experienced hackers, a lot of time, and advanced infrastructure. Only a handful of groups, mostly nation state actors, possess this level of capability, and al-Qaeda is not one of them**. **In the last ten years**, according to the National Counterterrorism Center's Worldwide Incidents Tracking Database, **there have been 63,192 incidents of terrorism. Not one was an incident of cyberterrorism.** As [Irving Lachow](http://www.ndu.edu/IRMC/ia/lachow.html) at NDU has pointed out, **the jihadist community heavily relied on one London-based hacker known by the moniker Irhabi 007, who at best had moderate ability. Since his arrest in 2005, indications are that al-Qaeda's cybercapabilities have only eroded**. While continuing to rely on petty crime to fund many plots, **al-Qaeda has been unable to capitalize on the explosion of cybercrime, lacking the technical capability to do so.** **For al-Qaeda to do any real damage with cyberattacks, it would need to make a multi-year investment in developing offensive cybercapabilities and would need a secure facility and advance test bed from which to do it. Understanding the control software for an electric grid is not a widely available skill. It is one thing to find a way to hack into a network and quite another to know what to do once you're inside.**

***( ) States won’t do it either***

**CSIS ’10** (Center for Strategic and International Studies ,“The Cyber War Has Not Begun,”March)

Weak attribution could allow an opponent to attack covertly, but this would require accepting the risk that the Americans would not eventually determine the source of the attack. **Uncertainty about how much the Americans know and how good they are at attribution makes attackers cautious. Fear of retaliation, including kinetic retaliation, for attacking the American homeland is a threshold that no nation has been willing to cross**. ***Call this deterrence if you like*. Even in a conflict –** with China over Taiwan or Russia over Georgia **– our opponents would be constrained in launching some kinds of cyber attack. Attacks on civilian targets in the continental United States could trigger a much stronger reaction than attacks on military targets and deployed forces**. Moving from deployed forces in theater to civilian targets in the homeland risks unmanageable escalation. **These risks and uncertainties create implicit thresholds in cyber conflict that nations have so far observed.** Just as with missiles and aircraft, our nation-state opponents have the ability to strike the United States using cyber attacks, but **they have chosen not to do so because of the risk of retaliation. While there are parallels to other weapons systems, cyber attack is unlikely to be decisive against a determined opponent**.

***Their China fusion leadership argument says its inevitable and happening now – it’s not reverse causal, the aff has ZERO evidence that says it will stop this***

***Chinese fusion research inevitable – and has ramped up despite prior US support***

**Shieber, 11** (Jonathan, “China Cranks Up Heat on Nuclear Fusion” WSJ, 5/26, <http://blogs.wsj.com/chinarealtime/2011/05/26/china-cranks-up-heat-on-nuclear-fusion/>)

According to a report in the state-run China Daily, **the central government is planning to train 2,000 experts to pursue research and development into magnetic confinement fusion**, which seeks to use magnetic fields to create the high-pressure conditions necessary for fusion.

A number of research institutes and private companies around the world are racing to perfect magnetic confinement.

China is already a signatory and participant in the France-based International Thermonuclear Experimental Reactor (ITER) project, that is perhaps the largest project pursuing magnetic approach. Arguably one of the most world’s ambitious multinational scientific undertakings, the project has a price tag of at least $21 billion and involves hundreds of scientists from China, the European Union, Japan, India Korea, Russia and the United States.

One concern among Chinese scientists is that the nation is not getting enough value out of its investment the ITER project. “China is trying to dispatch more qualified scientists to work on” the project, Cao Jianlin, vice-minister of science and technology, told China Daily.

Right now China provides 10% of the funding for the project, but supplies only 5% of the scientists, which means the country is missing out on valuable training for its would-be fusion experts.

Chinese engineers and scientists are currently responsible for building components such as heating, diagnostic and remote maintenance equipment for the project, as well as transporting it to Cadarache in the south of France, where the ITER reactor will be built.

Another researcher quoted by the China Daily thinks it’s not nearly enough and complained about the lack of exposure Chinese scientists are getting to the new technologies that could reshape the energy market.

“The ITER is related to 34 core scientific engineering technologies and management subjects,” Wan Yuanxi, dean of the school of nuclear science and technology under the University of Science and Technology of China, said. “Chinese researchers only work on 11 of them, which means we have no involvement in more than 60 percent of its core scientific engineering technologies and management subjects.”

In addition to its international efforts, **China is also pursuing its own research into fusion technologies in research around the country,** including at a laboratory in Chengdu.

**An April guideline issued jointly by China’s Ministry of Science and Technology,** the Ministry of Education, the Chinese Academy of Sciences and the China National Nuclear Corp. **recommends the government subsidize at least 200 researchers who intend to pursue doctorates in magnetic controlled fusion.**

Currently **there are 1,254 researchers have been involved with magnetic controlled fusion-related projects in China**, according to the China Daily report.

**Not to be outdone, the U.S. has spent billions of dollars on fusion research**, in addition to the work it is doing to promote ITER projects domestically and on the main project in France, although funding for the European project has been a political football in the past. Like China, the US is responsible for around 9% of the ITER project’s total costs, with the EU has taking on the bulk of financing.

***They still have tons of obstacles to overcome before fusion weapons are feasible.***

**Svoboda, ‘11**

[Elizabeth, Popular Mechanics, 7-1, “IS FUSION FINALLY FOR REAL,” <http://www.popularmechanics.co.za/features/is-fusion-finally-for-real/>]

**NIF scientists** have taken a completely different approach. Instead of undertaking the delicate task of confining plasma inside a magnetic field, they **aim to produce a controlled version of the fusion that takes place inside the Sun or a hydrogen bomb, using** lasers as the reaction’s driver – a technique called **inertial confinement fusion**. NIF’s Moses notes that many of the building blocks of the project’s massive laser array have already been used successfully in other industrial settings: laser diodes similar to NIF’s have enabled fibre optic data transmission in the telecommunications industry for years. “It’s a good place to be when you’re riding the wave of other people’s work,” he says.¶ With its pulsed magnetic field design, the Helion team claims it has found the elusive sweet spot in the fusion landscape: a reliable, cheap reactor that doesn’t require finetuned optics or complicated plasma confinement. In Helion’s reactor, electric currents flowing inside the plasma reverse the direction of a magnetic field that’s applied from the outside; the new, closed field that results effectively confines the plasma.¶ “Compared with the tokamak and NIF, Helion’s reactor is relatively compact and low-cost,” says Richard Milroy, a physicist at the University of Washington who isn’t affiliated with Helion. “Utilities don’t need to invest billions for the first test reactor to see if things will work out.” Plus, he says, the plasma-formation area is separate from the burn chamber in Helion’s reactor, so its expensive components may last longer.¶ **Still, all of these experimental fusion approaches face a host of scientific and practical unknowns. The massive numbers of neutrons generated during fusion may damage components of a tokamak over time, and the plasma inside can also become unstable, impeding the reaction.** And even though NIF has managed to achieve partial fusion by firing individual rounds into its target chamber, similar lasers would probably need to fire 10 to 15 times every second in LIFE, the demonstration power plant Lawrence Livermore is designing for the early 2020s. That kind of consistent firing would require a laser driver with a high repetition rate, which has yet to be developed and tested.

***No impact to fusion prolif -- the international community will be able to respond quickly and disable the facility.***

**Goldstone et al., ‘9**

[RJ., A. Glaser, AF Ross, Princeton University, “Proliferation Risks of Fusion Energy: Clandestine Production, Covert Production, and Breakout,” <http://web.mit.edu/fusion-fission/HybridsPubli/Fusion_Proliferation_Risks.pdf>]

In sum, it appears that **a time scale of at least 1–2 months would be required to produce one significant quantity of weapon-usable material in a fusion power plant after breakout. This period is dominated by the time required to reconfigure and restart the facility**. More analysis is required to refine this estimate, but it gives a sense of the time scale over which **the international community would be able to react without concern that significant quantities of fissile material had already been produced**. As with the fission breakout scenario, **there are political and diplomatic options at this point, but unlike** the **fission** case **there is also the option to disable the plant and prevent the production of weapon-usable material. Fusion power plants require many supporting facilities that are non-nuclear in nature, but if deactivated would immediately prevent the power plant from operating**. These include the massive power input and power conditioning equipment that provides electricity to the magnets, a very large cryoplant that provides liquid nitrogen and liquid helium to these magnets, and the secondary cooling system that removes heat from the system. Such facilities can be seen in the layout of the ITER site, shown in Figure 4. **These are distant from the fusion confinement system itself, and could be disabled without significant risk of nuclear contamination. The fact that this can accomplished before a significant quantity of weapon-usable material is produced represents a qualitative difference from the fission breakout scenario.**

***1) Fusion’s not key to spinoffs***

**Bruns et. al 12**

Peter Bruns, Minh Quang Tran, Daniel Kunz, Heinz Mueller, Christian Soltmann

Spillover benefits from controlled nuclear fusion technology – A patent analysis

World Patent Information, Volume 34, Issue 4, December 2012, Pages 271–278

<http://dx.doi.org/10.1016/j.wpi.2012.06.001>

a Swiss Federal Institute of Intellectual Property, Stauffacherstrasse 65/59g, CH-3003 Bern, Switzerland

b Centre de Recherches en Physique des Plasmas, Ecole Polytechnique Fédérale de Lausanne, Association Euratom-Confédération Suisse, Station 13, CH-1015 Lausanne, Switzerland, jj

One crucial finding of our analysis is that the most important fields outside fusion technology are materials science (assigned to 14 per cent of the retrieved documents), superconductive or hyper conductive conductors (13 per cent), plasma and laser physics (7 per cent) and particle physics (6 per cent) (Table 5). The first two technologies are important in the construction of large fusion devices and hence new innovations necessary for nuclear fusion devices might be of commercial interest reflected in patenting activity. **Plasma and laser physics**, **an important area for nuclear fusion, is not necessarily associated with nuclear fusion** although important in nuclear fusion technology and might also per se be commercially interesting and thus be protected by patents. **Particle physics are also likely to be applied in other areas than nuclear fusion**, e.g. breeding of tritium, or the handling of radioactive waste, **and thus be commercially interesting besides for nuclear fusion technology**. Other fields of technology of special concern to fusion research are plasma coating and semiconductor production.

***2) ITER solves spinoffs***

**The Japan Times**, August 24, 20**10**, A new push for nuclear fusion, Lexis, jj

**The ITER reactor** will be about 30 meters in both diameter and height but **will not generate electricity. Since it will integrate advanced technologies, innovation spinoffs for more practical purposes can be expected.** Apparently, **to take advantage of this opportunity, China, South Korea and India joined the project.**

***3) To win this advantage they have to win that once spinoffs are discovered, the USFG will invest more money into follow-up R&D so that tech can be commercialized --- that’s not happening***

**Williams 1/4/13** Jean Williams, PrairieDogPress writer; Artistic Director, Keystone Prairie Dogs. PrairieDogPress is the media channel for keystone-prairie-dogs.com, which is a fundraising website to support environmental groups for extraordinary efforts to protect Great Plains habitat and prairie dogs in the wild. 1-4-13, All Voices, GOP anti-science: Will research to prevent deadly pandemic survive spending cuts?, <http://www.allvoices.com/contributed-news/13737278-gop-antiscience-will-research-to-prevent-deadly-pandemic-survive-spending-cuts>, jj

**Anti-science Republicans have waged a war on the existence of climate change for years, using the absurd argument that scientists in 192 countries were all engaged in a mass conspiratorial campaign to dupe unsuspecting Americans.**

Furthermore, **many anti-science Republicans**—or at the very least Republicans who downplay the importance of science—**have often held influential seats on science-related committees in Congress**.

Sen. James **Inhofe** (R-Okla.) is a member of the Committee on Environment and Public Works. Inhofe famously **said that climate change couldn’t be the result of human activity. He said it would be impossible since “God’s still up there**.” **Inhofe suggested it was arrogant for people to imply they knew better than God, since He was the only one “able to change what He is doing in the climate."**

Former US Rep. Todd **Akin** (R-Mo.) **held a seat on the Committee for Science, Space and Technology**. **He** famously **said** that women who are victims of what he called "**legitimate rape**" rarely get pregnant, because a woman's body has a way of shutting the whole thing down. Akin, who was running for the US Senate in 2012, lost his Senate bid to incumbent Democrat Claire McCaskill.

So, even as the government heads in the right direction on one level by allowing avian flu research to continue, the upcoming sequestration process will be spearheaded by the most unproductive and divisive Congress in history, and **it doesn’t bode well for science on many levels**.

**The potential for any meaningful research** that could prevent multiple casualties on a global scale—and make the black-plague outbreak look tame by comparison—**could potentially be short-lived with obstructionist, anti-science Republicans wielding the scalpel on spending.**

***4) Huge timeframe before spinoffs will be beneficial -- takes longer than fusion to get right.***

**Rothwell, ‘97**

[Jed, cold fusion researcher, “Cold Fusion and the Future: Part 2 - A Look at Economics and Society,” March-June, Infinite Energy Magazine, Issue #13-#14, <http://www.infinite-energy.com/iemagazine/issue1314/future.html>]

Cold **fusion spin-off** like indoor farming, desalination, and aerospace engines **will take decades to develop**. **They will require massive investment, new factories, and years of research**. Cold **fusion itself will take time to perfect, but the spin-offs will take longer because they are more complex, and because large scale research on them will not begin until cold fusion is commercialized**. Indoor farming with robots might take 30 to 60 years to develop. It is cost effective for some crops already: flowers in the Netherlands, tomatoes in Tokyo, aquaculture in Boston. But it will be a long time, if ever, before we grow wheat more cheaply indoors than on the Great Plains. The change to automated indoor farming will occur gradually, giving displaced farm workers time to find new jobs. The energy production industries ­ oil, gas, coal, and the electric power companies ­ are another matter. **The potential for chaotic disruption here is very great**, because **the transition will be swift and it will be in one direction only. All jobs will be lost, none will be created.**

***5) No further spinoffs --- they would’ve been discovered***

**Manheimer 98** WALLACE M. MANHEIMER Back to the Future: The Historical, Scientific, Naval, and Environmental Case for Fission Fusion Code 6707 Plasma Physics Division April 2, 1998 Naval Research Laboratory, <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA347302>

Finally, there is now an effort to find an intermediate milestone for fusion research, so as to give our sponsors something useful in a more reasonable time. There has recently been at least one study of spinoffs [6],(using some particular algorithm to evaluate each), ranging from pollution abatement to remote sensing to medical applications to lithography. In a sense, this paper, advocating fission fusion is a search for a spin off. It would certainly be wonderful if these other spinoffs did exist, **but it is unlikely that they do**. The problem is that **fusion has been a well funded, well publicized program for decades now**. **If it had another application, we probably would have known about it long ago.** Furthermore, if after decades of promising an inexhaustible energy supply, we suddenly started selling say the 'medical tokamak', we would be accused of bait and switch big time. No, for better or worse, magnetic **fusion is almost certainly tied to energy supply.**

***6) Spin-offs fail --- bureaucratic hurdles***

**GAO 9** – United States Government Accountability Office, "Technology Transfer: Clearer Priorities and Greater Use of Innovative Approaches Could Increase the Effectiveness of Technology Transfer at Department of Energy Laboratories", June, http://www.gao.gov/assets/300/290971.html

**Challenges throughout the Technology Transfer Process Can Constrain DOE Laboratories' Efforts to** Identify and **Transfer Technologies for Others to Commercialize**: **Throughout the technology transfer process**--**which generally includes identifying promising technologies created at DOE's laboratories, attracting potential partners to commercialize the laboratories' technologies** or tap into the laboratories' capabilities, **and negotiating technology transfer agreement**s--**the laboratories face a number of challenges**. **Technology transfer officials at the 17 laboratories identified three main challenges** that constrain the number of promising technologies transferred out of the laboratories or limit laboratories' ability to share their capabilities: **competing priorities within a laboratory or a lack of staff with the expertise to identify and promote technologies having commercial promise**; **lack of funding to develop and demonstrate promising technologies in order to attract partners willing to commercialize them; and DOE-required terms and conditions of technology transfer agreements**, which sometimes complicate negotiations with potential partners. **Competing priorities, insufficient numbers of technology transfer staff, or gaps in staff expertise have sometimes constrained laboratories' ability to recognize and promote technologies with commercial promise.** DOE has acknowledged that although laboratory staff, particularly scientists, excel at innovation and invention, not all of them look beyond their research to possible applications in the marketplace. Some laboratory officials attributed this situation to a lack of interest in the processes involved in transferring technologies, while other laboratory officials said that their scientists are more focused on research and publication of their results than on collaborating with private companies. **The Federal Technology Transfer Act** of 1986,[Footnote 23] however, **makes technology transfer a responsibility of all federal laboratory scientists and engineers.** **Sometimes the commercial potential of certain research may not be evident until late into or after the research effort. As a result, laboratories may overlook or fail to promote promising technologies. In addition, technology transfer officials at 9 of the 17 laboratories said their laboratories may lack sufficient numbers of technology transfer staff or that skill gaps among the staff may constrain their laboratories' ability to identify and promote promising technologies. For example, technology transfer officials at one laboratory said that the number of staff devoted to technology transfer had declined from previous levels due to budget cuts, constraining the laboratory's ability to promote its technologies and identify and negotiate with potential partners.** Officials at another laboratory said that while technology transfer staff have the technical expertise to understand the laboratory's technologies, the laboratory lacks sufficient staff with the entrepreneurial or business development background needed to assess the commercial potential for all their technologies and match them with market needs. As a result, potential partners may be unaware of some commercially promising technologies at the laboratory. In addition, private sector representatives who have worked with DOE laboratories said that laboratory officials sometimes do not fully understand the marketplace or commercialization process beyond the laboratory's involvement. **After DOE's federally funded research effort has ended and promising technologies have been identified, additional development or testing may be needed before the laboratory can attract entities to license and commercialize those technologies. Known as the "valley of death," the situation can result in a failure to transfer promising technologies because,** on the one hand, **DOE has limited funding to continue research beyond its initial mission scope and, on the other, potential industry partners are often reluctant to assume the risks of investing in technologies whose potential has not been demonstrated with a prototype, performance data, or similar evidence.** **Technology transfer officials at 14 of the 17 laboratories told us that the lack of funding for additional development or testing was a significant constraint to transferring their promising technologies to the marketplace**.[Footnote 24] Examples of promising technologies currently languishing in the "valley of death" include the following: \* **Scientists at Oak Ridge National Laboratory developed a technology that detects toxic agents in water supplies**, such as reservoirs, rivers, and lakes, by analyzing the effects of such agents on algae occurring naturally in the water**. Although the technology, which gives results faster than present methods for testing water safety, has been licensed, and municipalities have shown interest in it, according to laboratory officials, adoption by municipalities has been stalled by lack of funding to develop a prototype,** which is needed before the Environmental Protection Agency can certify the technology for monitoring drinking water. \* **Officials at Idaho National Laboratory identified 14 technologies that showed promise but had not been successfully transferred out of the laboratory**, including a process for creating synthetic fuels from carbon dioxide, electricity, and steam. The same technology can also create hydrogen, which can itself be turned into electricity. Thus the technology could help in a transition away from fossil fuels. **According to laboratory officials, the technology has garnered "a high degree of interest" from industry but lacks funding for further research and development, which will be needed to attract private investment.** \* **Similarly, a device, known as a carbon-ion pump, shows promise as a technology for removing carbon dioxide from industrial emissions. According to the technology transfer office at Lawrence Livermore National Laboratory, where the device was developed, the pump involves a simple process for removing carbon dioxide from the air and other gases,** is appropriate for small industrial plants, and can produce clean water as a by-product. **The director of the laboratory's technology transfer office identified the pump as 1 of 20 technologies at the laboratory that had significant potential but needed funding for additional research and development before they could increase opportunities for commercial partnerships. Even when outside entities are interested in partnering with a laboratory, negotiating technology transfer agreements can sometimes be problematic. Although laboratory contactor officials generally negotiate the agreements with their potential partners, the agreements must be approved by DOE and include certain terms and conditions required by federal law or DOE policy**. While these terms and conditions may reflect legal requirements and address legitimate policy concerns, **officials at each of the 17 laboratories said that they can also present difficulties for partnering entities, sometimes slowing the negotiating process or discouraging potential partners**. **For example, outside entities entering into a work-for-others agreement with a DOE laboratory must agree to pay in advance, most typically, for 90 days of the work. Officials at several of the laboratories said that this requirement can be especially problematic for small businesses because they may not have enough capital to pay in advance.** Also, the requirement does not reflect standard commercial practices and can therefore prolong negotiations even with businesses that can afford to fund the work up front. DOE headquarters officials representing **the Technology Transfer Policy Board and the Office of the General Counsel told us, however, they are concerned that without the requirement DOE could be violating federal appropriations laws, because budgetary resources would have to be used to cover any costs that a sponsor failed to pay**. Other terms and conditions require the laboratories' CRADA partners and licensees to laboratory inventions to "substantially manufacture" in the United States any commercial products that include technologies licensed from DOE laboratories.[Footnote 25] **Officials from several DOE laboratories and a number of private-sector representatives we interviewed said that the requirement can present difficulties, in particular for companies that typically manufacture their products overseas. According to DOE headquarters officials, the requirement reflects federal and DOE policies of supporting U.S. industrial competitiveness.** Nevertheless, private-sector representatives we contacted emphasized the importance of reaching an acceptable agreement with the laboratories within a reasonable time frame, in light of competition in the marketplace.

**STEM**

***( ) No fusion before 2100***

**Revillem**, biochemistry professor, **12**

William Reville is an emeritus professor of biochemistry and public awareness of science officer at UCC. The Irish Times - Thursday, June 7, 2012 Fusion energy still a pipe dream <http://www.irishtimes.com/newspaper/sciencetoday/2012/0607/1224317432816.html>

NUCLEAR FUSION is the holy grail of power generation, promising the safe, clean generation of boundless energy from essentially limitless, cheap fuel – if we can ever get it to work. **The timeline for the development of nuclear fusion has been lengthened several times, costs have ballooned and it seems unlikely that nuclear-fusion power will be available before the end of this century**. The current situation is summarised by Geoff Brumfiel in the June edition of Scientific American. Massive energy is released in nuclear fusion because some of the matter in the atomic nucleus is converted into energy, as in Einstein’s famous equation E=mc2, where E is energy, M is mass and C is the speed of light. Even the tiniest amount of matter is equivalent to an enormous amount of energy, because C2 is such a huge number. The nuclear fusion of 1g of fuel releases the same energy as burning 11 tonnes of coal. The sun’s enormous energy is generated by nuclear fusion when hydrogen atoms fuse together to form helium. The plan for earthly nuclear fusion requires us to simulate the sun on Earth – an enormously difficult task. Fusion on Earth requires a temperature of 100,000,000 degrees Kelvin, 10 times hotter than the sun, whose huge gravitational field allows fusion to occur more easily. Two forms of hydrogen, deuterium and tritium, will fuel nuclear-fusion power plants. Deuterium is easily extracted from sea water and tritium, a mildly radioactive form of hydrogen, can be made from lithium, a fairly common metal. Hydrogen atoms exist as a “plasma” of positively charged atomic nuclei at fusion temperatures. Fusion temperature is reached by heating the hydrogen with a mixture of microwaves, electricity and bombardment with particles. A viable fusion plant must generate much more energy from fusion than the input energy necessary to heat the fuel to fusion temperature. The energy released will heat water, raising high-pressure steam to turn a turbogenerator that generates electricity. The principle of deriving fusion energy in this way was first demonstrated in the Joint European Torus (Jet) device at Culham, UK, which has been in operation since 1983. In 1997, a fusion power of 10 megawatts was sustained for 0.5 seconds and 65 per cent of the power expended to ignite the plasma was recovered through fusion. The 80 cubic metre Jet plasma is too small to produce a net energy gain. This will be the role of the International Thermonuclear Experimental Reactor (Iter) under construction in Cadarache, France, with a plasma volume of about 830 cubic metres. The Iter is designed to generate fusion power of 500 megawatts, 10 times the power needed to ignite the plasma. Iter is a collaboration of seven partners – EU, US, Japan, Russia, China, India and South Korea. The EU provides 45.5 per cent of the funding and each other partner provides 9.1 per cent. Each partner constructs different components for Iter in its own country and ships them to France for incorporation into **Iter. This arrangement is intrinsically awkward and dogs the project with delays and budgetary over-runs. Original construction costs were estimated at $5 billion (€3.9bn). This doubled in the mid-1990s and costs have now doubled again to $20 billion (€15.6bn). Iter fusion will operate intermittently, up to 30 minutes at a time, because materials that can withstand continuous fusion conditions are not yet available. A programme to develop these materials, essential for commercial reactors, is also under way, but it will have to overcome formidable technical difficulties**. Iter will test the feasibility of a sustained fusion reaction and will then become a test nuclear fusion power plant. Following several delays it is hoped to build Iter by 2020, after which about 1,000 scientists and engineers will work on the device for 20 years. If Iter works, a demonstration reactor with all the functions of a power plant will be built by 2050 and tested for 10 to 20 years. Finally, **it may be possible to start up full-scale nuclear fusion worldwide by 2100, but many things could lengthen this timeline**. Fusion technology emits no warming CO2 gas but nuclear fusion will not be available to mitigate the effects of global warming this century. Bringing the sun to Earth was never going to be easy, but work will continue because the dream of cheap, clean and virtually unlimited power is irresistible.

***Current cuts won’t affect domestic fusion --- duplication solves --- means spinoffs are inev***

**Malakoff**, 3/21/20**12** (David, Proposed U.S. Fusion Cuts Ignite Debate, Science Insider, American Association for the Advancement of Science, p. <http://news.sciencemag.org/scienceinsider/2012/03/proposed-us-fusion-cuts-ignite.html>)

Members of the panel repeatedly asked Brinkman about the implications of a plan, outlined in the Obama Administration's 2013 budget request released in February, to trim DOE's fusion energy sciences budget by 0.8%, to $398 million. At the same time, the budget would increase the U.S. contribution to ITER, a $23 billion fusion reactor being built in Cadarache, France, to $150 million, up from $105 million this year. **To help pay for the ITER increase, DOE is proposing to shut down a fusion experiment known as the Alcator C-Mod** at the Massachusetts Institute of Technology (MIT) in Cambridge. Cutting C-Mod, which is one of three major fusion devices in the United States, would save $18 million in the next fiscal year, which begins in October. **That plan, Brinkman told committee members**, partly **reflected an effort to avoid duplication, since C-Mod does research that could also be done elsewhere in the U**nited **S**tates and abroad. "I don't want to belittle the MIT work, [they have] done some very fine work," he said. But **the other two U.S. fusion projects—particularly the DIII-D tokamak** operated by General Atomics **in San Diego**, California—**are now more scientifically productive, he said**.

***Status quo cuts don’t eliminate domestic fusion support – a balanced program remains***

**Brinkman, 12 -** Director, Office of Science U.S. Department of Energy (William, CQ Congressional Testimony, 3/20, lexis)

**The Fusion Energy Sciences program request reflects the continued U.S. commitment to** the scientific mission of **ITER, while maintaining a balanced research portfolio across the program**. The ITER experiment aims to produce the world's first "burning plasma," in which thermonuclear reactions will produce net energy for the first time (with a projected amplification factor of ten).

The funding increase of $45 million for the U.S. contributions to the ITER Project bring the FY 2013 request to $150 million and will enable the U.S. to make long-lead procurements as the project enters its construction period. Eighty percent of U.S. ITER funding is spent in the United States. The majority of our ITER obligations are "in-kind," with components designed and built in the U.S. before being shipped to France for final assembly into the ITER apparatus. The continued long-term success of the U.S. fusion science efforts also depends on maintaining a healthy domestic fusion program. **The FY 2013 budget seeks to balance these competing priorities in the context of constrained budgets.** **Domestic research in most areas is reduced, while program balance is retained.** **The FY 2013 budget request ceases operations at the Alcator C-Mod tokamak facility at the Massachusetts Institute of Technology. Remaining investments still enable support for a broad program in fusion and plasma science research that will be highly impactful and maintain a vibrant U.S. workforce through**, among other means, **international partnerships**.

***Nuclear workforce strong now – our evidence is predictive – there’s is outdated***

Tabitha **Whissemor**, June 11th 20**11**, http://www.communitycollegetimes.com/Pages/Workforce-Development/nuclear-tech-programs.aspx

In June 2010, **CFCC graduated its first students with** associate in **applied science degrees in nuclear maintenance technology**. Many of them were already guaranteed a job. The college has partnered with GE Hitachi Nuclear Energy and Granite International to provide up to 20 students entering the program each semester with full scholarships and three years of guaranteed employment after they complete the program. But that only comes after a competitive screening process, rigorous coursework and a co-op semester where scholarship students travel to reactor sites around the U.S. for work-based learning. “It’s not for everybody,” Richey said. **At Three Rivers Community College** (TRCC) in Connecticut, **despite the intensity of the nuclear engineering technology program, there’s a long waiting list for students who want to enroll**. Workforce **demand, a good starting salary and** the opportunity for **upward mobility all play a part in that.** Evolving energy needs **It wasn’t always this way, though**. After the 1979 core meltdown at Three Mile Island in Pennsylvania, concerns were raised regarding training in the industry. In Connecticut, TRCC began working with Northeast Utilities in 1983 to address those concerns in its training program. “They saw the handwriting on the wall about the requirement for education,” said Jim Sherrard, the college’s program coordinator. TRCC works with the local **Millstone Power Station**, which also annually **provides full scholarships for 15** incoming **freshmen**. Seventy-five to **100 people apply each year** for the scholarships, Sherrard said. About half of the graduates enter the workforce immediately, most at the Millstone facility. **For a long time, TRCC was one of only a handful of institutions training people for the industry**, mainly because there wasn’t a demand for nuclear facilities. **However, the recent escalation in energy demands coupled with supply and environmental concerns over fossil fuels** and coal, Sherrard said **nuclear energy is growing** again **in popularity** and creating jobs.

***In order for grad students to chose STEM, there has to be STEM undergrads first --- no ev there’s enough of those --- retirement is irrelevant***

***Scholarships solve shortages***

**Mendoza**, 10/7/**12** (Monica, Colorado Springs Business Journal, “UCCS offers scholarships to military personnel pursuing STEM degrees” http://csbj.com/2012/10/07/uccs-offers-scholarships-to-military-personnel-pursuing-stem-degrees/)

The University of Colorado Colorado Springs will offer about 30 scholarships annually for past and current military service members interested in pursuing degrees in science, technology, engineering or mathematics [STEM]. Scholarships, up to $10,000 annually with the potential to renew, will be awarded based on financial need and a student’s interest in pursuing an undergraduate STEM degree – biology, chemistry, physics, mathematics, geography and environmental science, computer science, or computer, electrical, mechanical or aerospace engineering. “We hope to help our service members acquire a professional career, rather than just a job,” said Lisa Hines, UCCS Department of Biology assistant professor. “Many military service members already have training and experience with advanced technologies, so careers in these fields would be an ideal fit. However, the transition back to the academic setting can be difficult for various reasons. The goal of this grant is to assist with a smoother transition for this well-deserving population.” Hines and Jugal Kalita, UCCS College of Engineering and Applied Science professor, will lead efforts on a four-year $550,000 National Science Foundation grant designed to assist students who demonstrate financial need to study science and technology fields and eventually enter the workforce. Eligibility for the [scholarships](http://www.uccs.edu/students.html) will include military veterans and members from all service branches, including reservists. Awards will supplement any education benefits provided by the military or Veterans Administration and are not limited to tuition and fees. Recipients must meet UCCS requirements for admission which include completion of high school (or GED) and entrance exams such as the ACT or SAT.

***No impact – companies will just re-hire retired workers to solve shortages***

SyLVIA **WESTALL**, “nuclear’s losT GeneraTIon”, Reuters, November 20**10**, http://graphics.thomsonreuters.com/specials/Nuclear%20industry.pdf

Fierce **competition for skilled workers might force companies to entice older workers out of retirement** in the Western world. “**The industry cannot only count on the fresh minds that will be trained. That is not possible, it takes too long**. It takes four to five years for initial education and some time inside the company before they are operational,” **says** Cap Gemini’s Lewiner. Hans-Holger Rogner, **head of nuclear energy planning and economics studies** at the IaEa, agrees, and says **the industry cannot afford any age prejudice. When uranium prices went through the roof** in 2007, **companies “really went to the old people’s homes and said, ‘Well, you can sit in your armchair rocking back-and-forth or you can get back in the field at 75 years old**.’ I guess a similar thing will happen -- **you bring back the old knowledge.” Rogner**, 61, **will leave the IaEa** soon. Beginning his career in systems analysis after the oil price crisis in the 1970s, **he says he plans to continue in the nuclear sector even if he officially retires**. “**I am certainly not going to sit and twiddle my thumbs,” he says. “There is a lot to do.”** (additional reporting by Muriel Boselli in Paris, Vera Eckert in Frankfurt, daniel Fineren in London and James Regan in Sydney; editing by Simon Robinson and Sara Ledwith)

***Plan can’t solve faculty shortages***

Tabitha **Whissemore**, “Faculty shortage may hurt nuclear tech programs”, Published June 13, 20**11**, <http://www.communitycollegetimes.com/Pages/Workforce-Development/Faculty-shortage-may-hurt-nuclear-tech-programs.aspx>

In Connecticut, **the average starting salary** at the Milestone Plant **for a graduate fresh out of the nuclear technology program** at Three Rivers Community College (TRCC) **is around $63,000. For workers who earn master’s degrees** and have many years of experience in the industry, **the salary is well above that. So it’s no surprise that community colleges are having a hard time attracting experts** from the field **to serve as instructors for their nuclear tech programs, which has resulted in a shortage of faculty.** Budget cuts at colleges are accelerating the problem**. It causes a trickle-down effect—fewer faculty means enrollment is capped, which means fewer people are graduating from the program**.

***Nuclear primacy high***

The stockpile isn’t decaying---we’re upgrading the counterforce capabilities of every leg of the triad

**McDonough 9** – David S. McDonough, Doctoral Fellow at the Centre for Foreign Policy Studies at Dalhousie University, March 2009, “Tailored Deterrence: The ‘New Triad’ and the Tailoring of Nuclear Superiority,” online: http://www.canadianinternationalcouncil.org/download/resourcece/archives/strategicd~2/sd\_no8\_200

**Less noticed** **is the continuing** **modernization of the existing arsenal**. The **remaining** low-yield **Minuteman III ICBM warheads will be replaced by the high-yield MX warhead** **and** further **augmented by the inclusion of GPS** guidance **systems**. **The SLBM force** of highly accurate and high-yield D-5 warheads **will** also **benefit from** the addition of **GPS accuracy and ground-burst capability**. **Even the bomber force will become armed with stealthy and low-flying cruise missiles** – ideal to avoid an adversary’s early warning radar. **The nuclear force may** indeed **be smaller**, **but it is** also **becoming more accurate and more lethal**, and **ideal for disarming counterforce strikes**.

***( ) No impact --- conventional deterrence solves --- can defeat any weapon, including EMP and CBW***

**Perkovich 9**
(Adviser to the International Commission on Nuclear Non-Proliferation and Disarmament and a member of the Council on Foreign Relations Task Force on US Nuclear Policy, “Extended Deterrence on the way to a nuclear free world” International Commission on Nuclear Non-proliferation and Disarmament, May 2009, pg. [www.icnnd.org/research/Perkovich \_Deterrence.pdf](http://www.icnnd.org/research/Perkovich%20_Deterrence.pdf))

**The most credible** and perhaps least dangerous **way to assure allies of U.S. commitments to defend them is to station U.S. conventional forces on allied territories**, as is already the case in original NATO states and in Japan and South

Korea. **With U.S. conventional forces in harm’s way, an adversary attacking a U.S. ally would draw the U.S. into the conflict with greater certainty than if nuclear weapons were directly and immediately implicated**. Indeed, the greater credibility that U.S. conventional forces bring to extended deterrence is one reason why Poland has been keen to have U.S. missile defense personnel based on Polish soil. **Were U.S. personnel attacked, the U.S. would respond forcefully. Arguably the best way to strengthen the credibility of U.S. extended deterrence would be to stress that conventional capabilities of the U.S. and its allies alone are sufficient to defeat all foreseeable adversaries in any scenario** other than nuclear war. And as long as adversaries can threaten nuclear war, the U.S. will deploy nuclear weapons to deter that threat. Of course, basing U.S. conventional forces on allied territory also invites controversy in many places, including Japan. Such controversies are much less intense than would flow from proposals to base nuclear weapons, but they point to the fundamental underlying political-psychological challenge of extended deterrence. Allies want the protection that the U.S. can provide, and worry about abandonment, but they also don’t want to be implicated in U.S. policies that could entrap them in conflicts not entirely of their making. This tension is the heart of the extended deterrence challenge. To repeat, **rather than focusing on nuclear weapons, the U.S. and its allies should concentrate on building cooperation and confidence in overall political-security strategies in each region**. Indeed, it is worthwhile to honestly consider whether in Northeast Asia and CentralEurope and Turkey the recently expressed concerns over the future credibility of extended U.S. nuclear deterrence is a proxy for deeper concerns that are more difficult to express. For example, in Poland, Russia’s rhetoric and foreign policy, including the conflict with Georgia, elicit private worries that NATO would not actually risk confrontation with Russia to defend Poland against Russian bullying. Can NATO as a collection of 26 states with diverse interests and capabilities be relied upon stand up forcefully in behalf of Poland (and other new NATO states)? Doubts about the answer to this question at least partially explain why Poland has sought special guarantees from the U.S. **It is not clear that focusing on the nuclear element of extended deterrence in this situation helps produce policies and capabilities that actually would deter or dissuade Russia from bellicosity.** **The types of scenarios in which Russia might bully Poland are not likely to include credible threats of Russian coercion that would make countervailing use of nuclear weapons realistic or desirable. Indeed, raising the specter of nuclear threats could undermine the credibility of extended deterrence because allied states**, including the American public, **would probably become alarmed in ways that would weaken resolve to push back firmly against Russian pressure. This resembles the credibility problems of extended nuclear deterrence during the Cold War.**

***Zero risk of a war in Europe.***

**Bacevich ’10** (Andrew J, professor of history and international relations at Boston University, March/April, Foreign Policy, Iss. 178; pg. 71, “LET EUROPE BE EUROPE” proquest, jj)

**Over the course of the disastrous 20th century, inhabitants of the liberal democratic world in everincreasing numbers reached this conclusion: War doesn't pay and usually doesn't work**. As recounted by historian James J. Sheehan in his excellent book, Where Have All the Soldiers Gone?, **the countries possessing the greatest capability to employ force to further their political aims lost their enthusiasm for doing so**. Over time**, they turned away from war**. Of course, there were lingering exceptions. The United States and Israel have remained adamant in their determination to harness war and demonstrate its utility. Europe, however, is another matter. **By the dawn of this century, Europeans had long since lost their stomach for battle. The change was not simply political. It was profoundly cultural. The cradle of Western civilization** - and incubator of ambitions that drenched the contemporary age in blood - **had become thoroughly debellicized**. As a consequence, however willing they are to spend money updating military museums or maintaining war memorials, **present-day Europeans have become altogether stingy when it comes to raising and equipping fighting armies. This pacification of Europe is quite likely to prove irreversible**. Yet even if reigniting an affinity for war among rhe people of, say, Germany and France were possible, why would any sane person even try? Why not allow Europeans to busy themselves with their never-ending European unification project? It keeps them out of mischief.

***No shift back to testing ever***

Daryl **Kimball**, Arms Control Association, **9/7**/12, ACA Director Speaks in Moscow on CTBT, www.armscontrol.org/events/ACA-Director-Speaks-in-Moscow-on-CTBT

Why do I remain optimistic? Partly because the successful approval of New START in 2010 shows that even controversial arms control agreements can be approved in a tough political climate when the executive branch devotes sufficient time and high-level attention, when key Senators take the time to ask good questions and seriously consider the facts, and when U.S. military leaders speak up in support of the treaty.

It is self-defeating for **the U**nited **S**tates to oppose a treaty that prohibits an activity—nuclear testing—**for which it has no need or interest in resuming**. As Linton Brooks, the former head of the United States’ **N**ational **N**uclear **S**ecurity **A**dministration, said in December 2011: "**as a practical matter, it is** almost **certain that the United States will not test again** ... in recent years **I never met anybody who advocated that we seek authorization to return to testing**."

Another reason for optimism is President Barack Obama’s strong support for moving the CTBT forward.

In his April 5 speech in Prague, President Obama declared that his administration “will immediately and aggressively pursue U.S. ratification of the Comprehensive Test Ban Treaty.” More recently, March of this year, he said: “… my administration will continue to pursue ratification of the Comprehensive Test Ban Treaty.” And the official Democratic Party platform—out just this week—once again pledges to “work to ratify the Comprehensive Test Ban Treaty.

***Barriers to testing are insurmountable***

**Reif 12** Kingston Reif, is the director of nuclear nonproliferation at the Center for Arms Control and Non-Proliferation. A recipient of a Marshall Scholarship, he was awarded a prestigious Scoville Peace Fellowship in 2008. He blogs about nuclear weapons policy at Nukes of Hazard. 4-9-12, Bulletin of the Atomic Scientists, The case for the CTBT: Stronger than ever <http://thebulletin.org/web-edition/columnists/kingston-reif/the-case-the-ctbt-stronger-ever>, jj

What's more, **the United States has not conducted a nuclear test since September 1992 and has no plans to resume explosive testing**. As Lt. Gen. Frank Klotz, former commander of Air Force Global Strike Command, recently put it, "**Absent a radical change in the international environment, the political barriers to a resumption of testing would be** practically **insurmountable**." Given that **testing is not on the political agenda** and isn't necessary to the maintenance of the arsenal, that detection capabilities are at an all-time high, and that national security would be improved under the treaty, it's difficult to understand why the United States would not take advantage of the CTBT. After all, the United States has conducted 1,030 nuclear tests -- more than all other nations combined. The body of knowledge the United States has gleaned from this matchless testing history means that a permanent test ban would provide the nation with an enormous security advantage relative to other nuclear-armed states.

***No EMP impact***

**Butt ‘10** (Yousaf M, staff scientist @ Center for Astrophysics @ Harvard, Phd in astrophysics – Yale, 1-25, The Space Review, “The EMP Threat: fact, fiction, and response (part 1)” <http://www.thespacereview.com/article/1549/1>, jj)

**Serious long-lasting consequences of a one-kiloton EMP strike would likely be limited to a state-sized region of the country.** Although grid outages in this region may have cascading knock-on effects in more distant parts of the country, **the electronic devices in those further regions would not have suffered direct damage, and the associated power systems far from the EMP exposed region could be re-started.**

***No impact to bioweapons***

Gregg **Easterbrook**, The New Republic Editor, 20**01** ["The Real Danger is Nuclear: The Big One," 11/5, http://www.tnr.com/110501/easterbrook110501.html]

Psychologically, it may be that society can only concentrate on one threat at a time. But if that's the case--anthrax letters notwithstanding--the focus is in the wrong place. **Biological weapons are bad, but so far none has ever caused an epidemic or worked in war.** And it is possible that **none ever will: Biological agents are notoriously hard to culture and to disperse, while living things have gone through four billion years of evolution that render them resistant to runaway organisms**. Having harmed only a few people thus far, the anthrax scare may tell us as much about bioterrorism's limitations as about its danger.

***---------------------***

***Biomedicine and software fields are attracting STEM students now***

**CareerBuilder 11/14/12** CareerBuilder is the global leader in human capital solutions, helping companies target and attract their most important asset – their people. CareerBuilder.com’s team of career advisers, editors and writers are experts in job search strategy, career management, hiring trends and workplace issues. 11/14/12, AOL Jobs, Top STEM Jobs: 8 Science And Tech Careers In High Demand, <http://jobs.aol.com/articles/2012/11/14/stem-jobs-science-tech-careers/>, jj

**A set of jobs is receiving some well-earned attention**. President Obama has mentioned these jobs often in his speeches about improving the economy, nearly every industry is influenced by the discoveries that these workers make, and your children's toys and education are both directly affected by what these workers are capable of.

**STEM careers -- science, technology, engineering and mathematics -- are driving the economy and redefining modern living.** Whether you're beginning your career or are considering a change, learn about why STEM careers are leading industries across the nation and world\*.

**The Top 8 STEM Jobs**

Within the set of occupations, **these STEM jobs have the most projected growth through 2020:**

**Biomedical engineer: 62 percent.**

Medical scientist, except epidemiologist: 36 percent.

Software developer, systems software: 32 percent.

Biochemist and biophysicist: 31 percent.

Database administrator: 31 percent.

Network and computer systems administrator: 28 percent.

**Software developer, applications: 28 percent.**

Actuary: 27 percent.

***Plan’s attraction of these workers to nuclear fields trades off***

**James 12** David James, Master’s Degree in Ancient History/Classics at Swansea University in Wales. 6-8-12, The Political Importance of the Liberal Arts, <http://tigerpapers.wordpress.com/2012/06/08/the-political-importance-of-the-liberal-arts/>, jj

We have heard much about the relative decline of the American education system over the past decade (or two, or three). While there is much truth to these various assertions and statistics that document the decline, there have been a wide-range of different diagnoses of the root source of this general decline, as well as different proposed solutions. A common political response is broad rhetoric calling for an increase in development of the so-called STEM fields– Science, Technology, Engineering, and Mathematics. The last two American presidents have both specifically cited this solution in their State of the Union addresses, and have both increased funding for organizations and initiatives in these fields. Additionally, work visas for immigrants to the US are more readily available to applicants with a skilled background in the STEM fields. The thinking is that this type of expertise is necessary for innovation, and that this innovation will drive the economy and secure the future for the ‘winners’ of the most well-educated nation competition. All of this information is rather uncontroversial, and I certainly have no problem with more focus and funding for education on any kind, whether it is STEM-oriented or otherwise. An objection I have, however, is that the emphasis on **STEM field competition seems to be in danger of becoming a** sort of **Zero-Sum game, in which a** top-down political and corporate **mandate for more STEM education means a corresponding decrease of perceived importance or respect for other fields or types of education** that may not seem to lead to instant innovation or economic dynamism. I am speaking especially about the cultural fields of education known as the Liberal Arts, or the Humanities.

***Biomedical engineers solve extinction***

**NAE**, National Academy of Engineers, “Advance health informatics”, last date cited 20**06**, http://www.engineeringchallenges.org/cms/8996/8938.aspx

No aspect of human life has escaped the impact of the Information Age, and perhaps in **no area of life** **is** information **more critical than in health and medicine**. As computers have become available for all aspects of human endeavors, there is now a consensus that **a systematic approach to health informatics** — the acquisition, management, and use of information in health — **can greatly enhance** the quality and efficiency of medical care and **the response to widespread public health emergencies**. Health and **biomedical informatics encompass** issues from the personal to global, ranging from thorough medical records for individual patients to **sharing data about disease outbreaks among governments** and international health organizations. **Maintaining a healthy population in the 21st** **century will require systems engineering approaches to redesign care practices and integrate** local, regional, national, and **global health informatics networks**. On the personal level, **biomedical engineers** envision a new system of distributed computing tools that **will collect authorized medical data** about people **and store it securely** within a network designed to help **deliver quick and efficient care**. Basic medical informatics systems have been widely developed for maintaining patient records in doctor’s offices, clinics, and individual hospitals, and in many instances systems have been developed for sharing that information among multiple hospitals and agencies. But much remains to be done to make such information systems maximally useful, to ensure confidentiality, and to guard against the potential for misuse, for example by medical insurers or employers. What needs to be done to improve health information systems? For one thing, **medical records today are plagued by** mixtures of **old technologies** (paper) with new ones (computers). And computerized records are often incompatible, using different programs for different kinds of data, even within a given hospital**. Sharing information** over regional, national, or global networks **is further complicated by differences in computer systems** and data recording rules. Future systems must be engineered for seamless sharing of data, with built-in guarantees of accurate updating and ways to verify a patient’s identity. Keeping track of individual records is just part of the challenge, though. Another major goal is developing trusted systems that offer relevant decision support to clinicians and patients as well as archive medical research information. Doctors suffering from information overload need systematic electronic systems for finding information to treat specific patients and decision support systems to offer “just in time, just for me” advice at the point of care. **“There is a need**,” writes Russ Altman of Stanford University, “**to develop methods for representing biological knowledge** so that computers can store, manipulate, retrieve, and make inferences about this information in standard ways.” [Altman p. 120] How can health informatics improve health care? Apart from collecting and maintaining information, health informatics should also be put to use in improving the quality of care through new technologies. Some of those technologies will involve gathering medical data without a visit to the doctor, such as wearable devices to monitor such things as pulse and temperature. Monitoring devices might even come in the form of tiny electronic sensors embedded in clothing and within the body. Such devices are emerging from advances in microelectronic mechanical systems for health care delivery as wireless integrated microsystems, or WIMS. Tiny sensors containing wireless transmitter-receivers could provide constant monitoring of patients in hospitals or even at home. If standardized to be interoperable with electronic health records, WIMS could alert health professionals when a patient needs attention, or even trigger automatic release of drugs into the body when necessary. In effect, every hospital room could be turned into an ICU. Seamlessly integrating the input from such devices into a health informatics system raises the networking challenge to a new level. How can informatics improve response in public health emergencies? On the local to global scale, **a robust health informatics system would enable health professionals to detect, track, and mitigate** both **natural health and terrorism emergencies**. **Biological and chemical warfare are not new to human history**. From ancient times, warriors have tried to poison their enemies’ water. Today, of course, **the threat of such attacks** comes not only from military engagements in ongoing wars, but **from terrorists capable of striking almost anywhere at any time. Protecting against such assaults will require an elaborate and sophisticated system for prompt and effective reaction. Meeting that challenge is complicated by the diverse nature of the problem** — **terrorists have a vast arsenal of biological and chemical weapons from which to choose**. Perhaps the most familiar of these threats are toxic chemicals. Poison gases, such as chlorine and phosgene, essentially choke people to death. Mustards burn and blister the skin, and nerve gases, which are actually liquids, kill in the same way that pesticides kill roaches, by paralysis. As serious as chemical attacks can be, most experts believe their risk pales in comparison with their biological counterparts. Of particular concern are potent biological toxins including anthrax, ricin, and botulism neurotoxin. **Anthrax has** received special attention, partly because of the deaths it caused in the U.S. in 2001, but also because its **potential to produce mass death is so large**. It’s not hard to imagine scenarios where airborne release of anthrax could infect hundreds of thousands of people. **Antibiotics can be effective** against anthrax bacteria **if provided soon enough. But that window of opportunity is narrow**; after the germs release their toxic chemicals, other defenses are needed. How to you prepare against chemical and biological weapons? **Providing data to feed an informatics system in preparation for bio** and chemical **terror involves engineering** challenges in three main categories. One is surveillance and detection — monitoring the air, water, soil, and food for early signs of an attack. Next is rapid diagnosis, requiring a system that can analyze and identify the agent of harm as well as track its location and spread within the population. Finally come countermeasures, powered by nimble operations that can quickly develop and mass-produce antidotes, vaccines, or other treatments to keep the effects of an attack as small as possible and track how effective the countermeasures are. Efficient and economical monitoring of the environment to find such agents early is a major challenge, but efforts are underway to develop sensitive detectors. “Artificial noses,” for example, are computer chips that can sort out and identify signals from thousands of potentially deadly chemicals. These systems are still much less sensitive than the canine nose, however, and their perfection is an engineering challenge. Toxins or viruses might also be identified using biological detectors. Ultra-tiny biological “nanopore” devices can be engineered, for example, to send electrical signals when a dangerous molecule passes through the pore. Yet another novel method would track not the attack molecule itself, but molecules produced by the body’s response to the invader. When exposed to bacteria, immune system cells known as neutrophils alter their internal chemistry. Profiling such changes can provide clues to the invader’s identity and suggest the best counterattack. Databases cataloging the cellular response to various threats should ultimately make it possible to identify biowarfare agents quickly with simple blood tests. How to you prepare against a pandemic? **Nothing delivers as much potential for devastation as natural biology**. From the **bacterium** that **killed** half of European civilization in the Black Death of the 14th century to the 1918 Spanish Flu pandemic that killed 20 million people, history has witnessed the power of disease to **eradicate huge portions of the human population.** In the 21st century, the prospect remains real that flu — or some other viral threat, yet unknown — could tax the power of medical science to respond. Bird flu, transmitted by the virus strain known as H5N1, looms as a particularly clear and present danger. **A major goal of pandemic preparedness is a good early warning system**, relying on worldwide surveillance to detect the onset of a spreading infectious disease. Some such systems are now in place, monitoring data on hospital visits and orders for drugs or lab tests. Sudden increases in these events can signal the initial stages of an outbreak. **But certain events can mask trends in these statistics, requiring more sophisticated monitoring** strategies. These can include tracking the volume of public Web site hits to explain acute symptoms and link them to geocodes, such as zip codes. **Having an integrated national information technology infrastructure would help greatly**. Closures of schools or businesses and quarantines may actually reduce hospital use in some cases, and people may even deliberately stay away from hospitals for fear of getting infected. On the other hand, rumors of disease may send many healthy people to hospitals for preventive treatments. In either case the numbers being analyzed for pandemic trends could be skewed. New approaches to analyzing the math can help — especially when the math describes the network of relationships among measures of health care use. In other words, monitoring not just individual streams of data, but relationships such as the ratio of one measurement to another, can provide a more sensitive measure of what’s going on. Those kinds of analyses can help make sure that a surge in health care use in a given city because of a temporary population influx (say, for the Olympics) is not mistaken for the beginning of an epidemic. Similarly, mathematical methods can also help in devising the most effective medical response plans when a potential pandemic does begin. Strategies for combating pandemics range from restricting travel and closing schools to widespread quarantines, along with vaccinations or treatment with antiviral drugs. **The usefulness of these approaches depends on numerous variables — how infectious and how deadly the virus is, the availability of antiviral drugs and vaccines, and the degree of public compliance with quarantines or travel restrictions.** Again, understanding the mathematics of networks will come into play, as response systems must take into account how people interact. Such models may have to consider the “small world” phenomenon, in which interpersonal connections are distributed in a way that assists rapid transmission of the virus through a population, just as people in distant parts of the world are linked by just a few intermediate friends. Studies of these methods, now at an early stage, suggest that rapid deployment of vaccines and drugs is critical to containing a pandemic’s impact. Consequently new strategies for producing vaccines in large quantities must be devised, perhaps using faster cell culture methods rather than the traditional growing of viruses in fertilized eggs. A system will be required to acquire samples of the virus rapidly, to sequence it, and then quickly design medications and vaccines. The system needs to have technologies to enable rapid testing, accompanied by a system for accelerating the regulatory process. If there is an emergency viral outbreak that threatens widespread disease and death in days or weeks, regulatory approval that takes years would be self-defeating. “It will be imperative to collect the most detailed data on the . . . characteristics of a new virus . . . and to analyze those data in real time to allow interventions to be tuned to match the virus the world faces,” write Neil Ferguson of Imperial College London and his collaborators. [Ferguson et al. p. 451] **The value of information systems to help protect public safety and advance the health care of individuals is unquestioned.** But, with all these new databases and technologies comes an additional challenge: protecting against the danger of compromise or misuse of the information. In developing these technologies, steps also must be taken to make sure that the information itself is not at risk of sabotage, and that personal information is not inappropriately revealed.

***Software engineers are key to military competitiveness and the defense industry base***

Mathew **Kazmierczak** Partner, Content First, LLC Michaela Platzer President, Content First, LLC, Pierre Chao Director of Defense Industrial Initiatives and Senior Fellow, International Security Program Center for Strategic and International Studies Andrew Howell Vice President, Homeland Security Policy U.S. Chamber of Commerce, “Defense Trade: Keeping America Secure and Competitive” 20**07**, http://www.uschamber.com/sites/default/files/issues/defense/files/defensetrade.pdf

Most important, the **U.S. defense** and closely associated aerospace industry **needs a constant supply of the nation’s** highly skilled and educated **scientific** and **engineering talent to maintain its competitiveness**. Defense spending generates good jobs and well-paid careers across many scientific and technical fields, including electrical and electronics engineering, aerospace engineering, and mechanical engineering. These occupations, among others, contribute substantially to the production of military-related hardware and software. **For the U.S. military to remain competitive, defense and aerospace firms must continue to attract and retain the best and brightest scientists and engineers** so that they can develop systems and build products that keep our fighting forces the envy of the world. Defense-Related Science and Engineering Workforce 1 in 10 engineering jobs are tied to defense-related spending. 1 in 3 aerospace engineers work in defense-related jobs. Almost **1 in 10 computer software engineers work in defense-related jobs**. Nearly 1 in 10 electrical engineers work in defense-related jobs. 1 in 4 astronomers work in defenserelated jobs. 1 in 4 mathematicians work in defenserelated jobs. Nearly 1 in 5 physicists work in defenserelated jobs. 6 **The Department of Defense projects that it will need more than 425,000 civilian computer specialists, scientists, and engineers to support the nation’s defense and aerospace industrial base** in 2006. Of these occupations**, the Defense Department anticipates needing more than 175,000 computer specialists and mathematicians and scientists i**n 2006. Further, projected employment requirements of the defense and aerospace industry include 36,600 electrical and electronics engineers and 17,600 aerospace engineers in 2006. 7

# 2NC

## STATES

### CP Solvency Overview

#### First – The whole aff is a question of 50 million dollars – even their most hyperbolic solvency advocates say this is sufficient to solve every aff internal link --- your Lab

PPPL 12 – Princeton Plasma Physics Lab, SUPPORT FUSION ENERGY SCIENCES IN FY 2013, <http://fire.pppl.gov/Fusion_Day_One_Page_leaders.pdf>, jj

The FY 2013 budget requests $398.3 million for OFES. While the budget's $150M for the U.S. Contributions to ITER is a $45M increase from the FY 2012 level, it is $50M below the U.S. ITER Project's plan, making U.S. achievement of the international ITER schedule extremely difficult. The budget only includes approximately $248M for domestic fusion research, a $49M decrease from the current funding level. This cut would have a devastating impact on the U.S. fusion program, most pointedly by shutting down one of the three facilities critical to continued U.S. leadership in fusion. After years of operating on minimal budgets and essentially level funding, the domestic fusion program cannot absorb the proposed reductions without significant negative impacts to the program and our scientific and engineering contributions. The FY 2013 Budget Request would result in: • The shutdown of Alcator C‐Mod at MIT, one of three major U.S. fusion research facilities; • Cutbacks in operations, reduced productivity, and delayed upgrades at the remaining fusion facilities; • Substantial layoffs of scientists, engineers, and support personnel throughout the country; • Significant cutbacks in fusion theory, computation, and simulation; • A severely weakened ability to contribute to and, importantly, benefit from the advances made by ITER; • Increasing cutbacks in university research, the loss of numerous students and professors from the U.S. fusion program, and the related impact of discouraging future fusion researchers from entering the field; • Contraction in plasma research and a jeopardized ability to design and build future fusion systems in this country; • The U.S. ceding further advantage to our ITER partners, which together expend considerably more effort and resources toward fusion than the U.S.

#### Third – the DoE laboratories get State funding now – disproves their disads

Kay **Corditz**, 3-15-**2010**, “State Grant to Fund Advanced Battery Materials Partnership,” Brookhaven National Lab, http://www.bnl.gov/newsroom/news.php?a=21663

Funded by a $550,000 grant from the **New York State** Energy Research and Development Authority (NYSERDA), Brookhaven National Laboratory will partner with battery materials researchers from leading New York State universities to explore new chemistries and synthesize new materials for long-lasting batteries. The Laboratory will partner with SUNY’s University at Buffalo and Binghamton University on three projects to develop improved batteries for use in stationary grid-scale energy storage applications, including lithium-air, lithium-ion, and lithium-titanate batteries. The Brookhaven effort, led by Brookhaven materials scientist Jason Graetz, will focus on the development and synthesis of new materials, and application of advanced experimental techniques to characterize these materials using Brookhaven’s National Synchrotron Light Source (NSLS). The SUNY-Buffalo lead is Esther S. Takeuchi, and the Binghamton University lead is M. Stanley Whittingham. “This partnership among Brookhaven and two leading SUNY schools will capitalize on the research strengths of each, and our materials characterization capabilities will be a key element of the project,” said James Misewich, Brookhaven’s Associate Laboratory Director for Basic Energy Sciences. The collaboration grew out of a workshop sponsored by Brookhaven and Stony Brook University’s Joint Photon Sciences Institute (JPSI) last spring. Chi-Chang Kao, NSLS Chair and Founding Director of JPSI, coordinated the collaboration’s successful proposal. “It is an excellent example of how universities, industries, and national laboratories can work together to address an important scientific challenge with major societal impact,” said Kao. Said Graetz: “NYSERDA’s funding of this program will give us the opportunity to expand our energy storage research to large-scale stationary energy storage systems, which are crucial for integrating intermittent renewable generation sources such as wind and solar. In the past, the vast majority of battery research investment has focused on the important problem of electrical energy storage for transportation. However, a different set of criteria exist for stationary systems, and this project will allow us to explore new electrode materials, like lithium titanate, that meet those criteria.”

### A2: Perm Do Both

#### 2) Doing both guts solvency – CP alone can bridge the funding gap

Kathleen Sebelius and the Securing a Clean Energy Future Task Force, Former Governor of Kansas, Securing a Clean Energy Future, A Report for the National Governors Association as part of the Securing a Clean Energy Future Initiative, 2008, http://www.nga.org/files/live/sites/NGA/files/pdf/0807ENERGYRD.PDF

In deciding when and how to enact tax credits for clean energy, states should consider existing federal tax credits. If state incentives overlap too closely with federal ones, the state may become ineligible for federal assistance. 61 The current federal production tax credit of 1.5¢ per kWh for renewable energy is set to expire on December 31, 2008; it may be renewed, but if not, states may be in a position to bridge the gap. One tax approach related to clean energy is a carbon tax, which is one of two primary regulatory mechanisms to reduce carbon emissions. The carbon tax penalizes high emitters and rewards low emitters. (The other approach is “cap and trade,” discussed on page 28). Both strategies attempt to make fossil fuels more expensive and reward clean energy investments. No state has yet enacted a carbon tax, but several municipalities are in the process of doing so, including Boulder, Colorado (Box 18), and the San Francisco Bay Area. 62

### A2: Distributed Risk / Jurisdiction (Hartwig)

#### 3) State R&D superior for tech transfers and spinoffs

Kathleen Sebelius and the Securing a Clean Energy Future Task Force, Former Governor of Kansas, Securing a Clean Energy Future, A Report for the National Governors Association as part of the Securing a Clean Energy Future Initiative, 2008, http://www.nga.org/files/live/sites/NGA/files/pdf/0807ENERGYRD.PDF

However, it is worth noting that many of the clean energy industries are still in the early stages of their development, and there are opportunities for many states and firms that do not exist as mature industries. States may want to take more aggressive actions to support the development of technologies or industries where they may have a comparative advantage or head start, even if they do not have an established strength. Oregon’s effort to develop ocean wave energy illustrates this example: The technologies are still commercially unproven, but the state is uniquely positioned to bring them to fruition (Box 10). Box 10: Oregon National Ocean Wave RD&D Energy Center In Oregon, a group of public and private organizations is working to establish in the state a national hub for ocean wave energy research. Oregon is ideally situated for wave research: Its coastal characteristics endow it with reliable and high-energy waves, and its population is concentrated along the coast, obviating the need for expensive new transmission lines. 32 Oregon also benefits from world-class engineering facilities. Oregon State University (OSU) in Corvallis houses the Motor Systems Resource Facility (MSRF), the highest powered university energy systems laboratory in the country, as well as the Hinsdale Wave Research Lab, which provides an artificial testing ground for wave-powered devices. 33 Adding to these benefits are the expertise and infrastructure of Oregon’s paper milling, fisheries, and manufacturing industries. OSU has applied to DOE’s Office of Energy Efficiency and Renewable Energy for a grant to establish a National Wave Energy Research and Demonstration Center based at OSU. 34 While this project is pending, other progress is being made. The Oregon Wave Energy Trust (OWET) 35 —a newly established advisory body with representation from state government, universities, utilities, and industry—is coordinating demonstration projects with OSU’s existing wave energy technologies, ensuring the involvement of all relevant stakeholders. Wave energy in Oregon shows how a state can build on, and seek synergies between, its existing strengths. In Oregon’s case, a wave energy industry may also help replace jobs that have been lost in the fishing and forestry industries. 32 The state can play, and has already played, an important role in getting diverse groups together to realize the opportunities of clean energy

#### 4) States doing applied R&D funding now

Milford, 12 (Sr. Fellow-Brookings & President-Clean Energy Group, “Leveraging State Clean Energy Funds for Economic Development,” http://www.brookings.edu/~/media/research/files/papers/2012/1/11%20states%20energy%20funds/0111\_states\_energy\_funds)

Without a doubt the impacts of state project finance are significant and have been vital for the growth of the clean energy industry in the United States. The price of renewable energy technologies like solar and wind has come down in part through the sheer volume of project activity. However, it is becoming clear to many states that to truly grow the clean energy enterprise they must do more than just help bring down the costs of clean energy technologies through project financing. This recognition has resulted in a new generation of state programs, spearheaded by several of the state clean energy funds, that go beyond project finance. All of which points to a new brand of fund activity. Along these lines, increasingly ambitious efforts in a number of states have featured engagement on at least three major fronts: (1) **cleantech innovation support through** research, development, and deployment (**RD&D) funding**; (2) financial support for early-stage cleantech companies and emerging technologies, including working capital for companies; and (3) industry development support through business incubator programs, regional cluster promotion, manufacturing and export promotion, supply chain analysis and enhancement, and workforce training programs. On the cleantech innovation front, a few funds such as California’s through its Public Interest Energy Research (PIER) program have supported cleantech RD&D efforts. PIER, for example, funds basic and applied research on topics ranging from work on electricity grid improvement and building and lighting technologies to industrial process improvement, energy storage, renewable technologies, and other areas. In like fashion, a few states have used their CEFs to make equity investments in solar, wind, and bioenergy companies and also provide working capital for expanding growth companies. The Massachusetts Clean Energy Center’s (MassCEC) Investments in the Advancement of Technology program, for example, makes venture capital equity investments in promising early-stage companies that are developing and commercializing new clean energy technologies. And for that matter, some state CEFs have been providing industry development support in a variety of ways, whether through the development of business incubator programs such as those run by the New York State Energy Research and Development Authority (NYSERDA); workforce training programs such as the California Clean Energy Workforce Training Program; or initiatives focused on clean energy industry supply chains such as those maintained by Ohio’s Advanced Energy Fund (AEF). All of which suggests that the next era of state clean energy fund leadership is coming into focus thanks to existing fund experimentation. What is needed now, then, is a new, creative period of expanded CEF focus on clean energy economic development and industry creation to complement and build upon project financing for the installation of clean energy technologies. Such work could not be timelier at this moment of federal gridlock and market uncertainty.

### A2: Not Constitutional (Hartwig)

#### 1) Framing issue – Their author is making assertions with little knowledge – for what it’s worth he also votes neg

**Hartwig 12** – Zach, Ph.D. Candidate in Plasma Physics and Fusion Energy – MIT, BS in Physics – Boston University, Email Exchange with Casey Harrigan, 10-23, <http://msudebate.blogspot.com/2012/10/exchange-with-hartwig-2.html>

However, I'll take crack at your constitutionality question because it's an important one. I will note that I am by no means a Constitional scholar or expert on this issue... One can make a strong argument that the Constitution explicitly assigns the federal government the power to carry out national research programs. Historically, the main reason for this is simply that the fledgling U.S. government needed to rapidly establish firm foundational law on a number of science or science-related issues to ensure the coalescence of states into a single federal entity. Consider the following: a national system of standard weights and measures was necessary not only to ensure fair and trusted economic transactions across an enormous continent but also as a basis for national identity (i.e. creating a sense of "U.S. nationalism" in a geographically disparate and diverse population). Such a system -- so vital to U.S. survival -- could only be established by a federally-funded body of scientists and engineers who had the authority to mandate a single system of weights and measures. One can identify a number of other such issues facing the framers that either explicitly required science or would benefit tremendously from the application of science; and indeed, these issues were codified into the U.S. Constitution, primarily in Article I, Section 8, such as a standard system of weights and measures (Clause 5); postal service and communication (Clause 7); intellectual property (Clause 8), and national defense (Clause 12 and 13). In fact, the preamble to Article I, Section 8 explicitly states the fact: "The Congress shall have Power To lay and collect Taxes, Duties, Imposts and Excises, to pay the Debts and provide for the common Defence and general Welfare of the United States..." with the clear implication that activities that benefit the national security interests and broad improvement of the U.S. as a whole are to be funded with federal taxpayer dollars. The heavy federal investment in defense, primarily since World War II (where the inventions of radar, altitude detonators, and the Atomic Bomb demonstrated to the world the physicists win wars) and public health (which have drastically increased the quality of life and economic productivity) further enmeshes scientific research with national security and welfare and serves to justify this preamble. Article I, Section 8 ends with the strongest statement of U.S. federal power to use taxpayer funds to conduct research (especially when combined with Amendment 10 that states that no power explicitly assigned to the Federal government may by wielded by the states); "To make all Laws which shall be necessary and proper for carrying into Execution the foregoing Powers, and all other Powers vested by this Constitution in the Government of the United States, or in any Department or Officer thereof." thereby directly stating that the powers assigned to the federal government in Section 8 (when combined with Amendment 10) are to be used by the federal government alone. It would be fascinating to research the juriprudence on this issue to see how the courts have interpreted these clauses with respect to science; however, that's outside my scope. In principle, I think that state could sponsor fusion research; however, in practice and precedent, the federal government will almost exclusively fund fusion for the foreseeable future.

#### 2) Your argument about “national security” authority is wrong

Your authors warrant is that fusion could fall under the definition of “national security”. This is not true. “National Security” appropriation is statutorily defined as the foreign operation, export, military construction, DoD, and Department of State budgets

Roy E. Brownell II, Editor-in-Chief, The American University Law Review, June 1998, 47 Am. U.L. Rev. 1273

The statutory construction given National Security Rescission, however, would limit the President'srescissionauthority to the four national security-related spending bills. n369 The spending provisions within these bills are statutorily defined as relating to certain topics and, therefore, are legally distinct from other areas of federal spending. n370 Even if a spending bill were packaged with other bills into omnibus legislation, the various appropriations bills are still discrete within their own boundaries. Such statutory provisions could not be disregarded lightly. n369. See supra note 7. n7. By "national security," the author is referring to the President's military prerogatives as Commander in Chief and his foreign affairs powers as Chief Diplomat. Therefore, this Comment maintains thatthePresident's constitutional national security prerogatives, coupled with the congressional delegation from the Line Item Veto Act, would have a**llowed** the President to cancel **provisions within** the Foreign Operations, Export Financing and **Related Programs** Appropriations Act, Military Construction Appropriations Act, **Department of Defense** Appropriations Act, and the Department of State provisions within the Departments of Commerce, Justice and State, the Judiciary and Related Agencies Appropriations Act. See infra note 411 (providing sample provisions that the President could have canceled to achieve a favorable test case).

### A2: Duplication / Can’t Access Fed Labs (Olynyk)

#### 2) Here’s proof from their own email – Framing issue: You should treat this evidence as the “gold standard” - Despite fishing for answers, their author could come up with none that applied to the specifics of the counterplans.

**Harrigan & Olynyk ‘12**

"Exchange with Olynyk 2" ~http://msudebate.blogspot.com/2012/10/exchange-with-olynyk-2.html~~

Geoff,

No need to re-write for formality. The way you've stated the argument has been clear and easy to comprehend. I do have a couple of follow-up questions, if you have the time:

The case against 50 state-run fusion research programs seems strong, given the scale and complexity of the effort, non-linear gains, and other concerns that Zach cited (risk of failure to individual states and Constitutional barriers). As I understand, there are three major fusion research facilities in the United States: Alcator C-Mod at MIT, PPPL at Princeton, and DIII-D at General Atomics. (Please correct me if this is wrong).

1. In a time of federal fiscal restraint (at least) and austerity (at worst), should those three (C-Mod, PPPL, DIII-D) seek funding from state governments? Would it even be possible for them to do so? Do the problems that you cite with 50 state-run programs apply to a situation where there are only 3 programs with 50 different state sponsors?

2. When referring to the national labs, you wrote that "they can't just decide to do fusion research on their own - the federal government has to give them the money and instruct them to do so". Does this mean that national labs are precluded from taking money from outside (non-federal) sources? Do they exclusively receive funding from the federal government?

3. What are the risks of duplicating fusion research? I could see that money would be wasted, but do you see ways that it could affect progress in research / fusion development?

Thanks again for your time. Also, I realize that some of the questions that I have asked may seem obscure or tangential to the major issues facing the domestic fusion research project at this time. As a competitive debate team, we are forced to respond to every argument advanced by our opponents, even when they are not necessarily "central" or commonly discussed by those writing in the field. That is partially why I wanted to reach out to seek answers that were on point to a relatively narrow research question. I appreciate your patience and willingness to engage with me.

Best,

Casey

--

Casey,

Your understanding is correct. These are the three major tokamak/magnetic fusion facilities (C-Mod/MIT, DIII-D/GA, and PPPL which has NSTX-U and some smaller devices). There is also NIF at Livermore (although this is primarily a weapons-research facility, as is most inertial fusion research), plus a group at ORNL doing magnetic fusion (they used to have tokamaks like ORMAK), plus smaller devices at U. Wisconsin, U. Washington, Columbia, Auburn, and UCLA. The various UCs also send students to DIII-D, primarily UCSD. So, to answer your questions:

1. I don’t think anything legally stops C-Mod from getting funding from state governments (or even private actors), it’s just exceedingly unlikely that this would happen. C-Mod has a budget of about $29-million/year; I don’t think Massachusetts, for example, funds anything close to this amount for research. This kind of thing has always (since WWII at least) been done through the federal government. And, you say, why could states not pool funds – well sure, but why would (say) Pennsylvania fund a research facility in Mass? So while it’s not strictly impossible, I don’t see it happening, realistically.

2. Regarding the national labs, including PPPL, they may actually be banned from taking private funding. Those labs, remember, do the nation’s classified weapons research as well as civilian magnetic fusion research… so my guess is that it would be exceedingly difficult for them to get permission to take private money. I’m just speculating, though; I have no actual knowledge of the legal status of those labs. Even if it were legally allowed, you get the same problems as listed above, about whether any one state even could fund such a facility.

3. Well, there is a lot more work to be done than there is money available to pay people to do the work (and to buy equipment). So if you duplicate something, you’re spending money on that duplication that would be better spent doing something else. That’s the risk. And you might say, well, wouldn’t you want more than one lab to verify the result? Well, yes, but that already happens. The way it generally works is, a lab has (say) a strong research program in Ion Cyclotron Heating. Diversion – C-Mod is in reality a world leader in ICH. So we try different types of ion cyclotron antennas (the metal structure that gets power from a big coaxial cable into the plasma… like a TV or radio broadcasting antenna, but very different shape… you can see them on the walls of C-Mod in the picture here: http://commons.wikimedia.org/wiki/File:Alcator\_C-Mod\_Tokamak\_Interior.jpg they look like grill bars or something – those are actually protective bars over the actual antenna, which is a copper strap beneath it. Anyway, so we might try a bunch of different antenna designs, and most of them will work slightly better than the previous generation. Some fail outright (like one time we built a Lower Hybrid launcher – a different kind of antenna – out of titanium, and it reacted with something in the plasma and disintegrated to dust within a few months!) This is normal. But every now and then, something we do on ICH is a huge breakthrough. Like, an antenna that is able to handle more power for the same size of antenna, or something like that. And only then do the other labs all go and build one. So we spend the money to make the advance, and then they’re able to replicate it for some small fraction of that. In contrast, if they were doing their own ICH research, they might make all the same mistakes. Imagine if every lab had built a titanium LH launcher, and found out that it wasn’t compatible with the plasma. So it makes more sense to coordinate efforts, to some extent. Which might be harder if each state were running their own research program. Now, you could imagine some coordinating body that tries to reduce duplication of effort, and allow the facilities to do joint experiments. This is in fact what we have internationally, mainly through a body called the ITPA (International Tokamak Physics Activity). I just don’t see the point of devolving it down to the state level in the U.S.

So hopefully that helps a bit. Let me know if I can do anything else!

Regards,

Geoff

#### 3) States solve coordination with DOE labs

**DOE**, 3-16-**2011**, “Experimental Program to Stimulate Competitive Research,” EPSCoR, http://science.energy.gov/bes/epscor/about/

Overview: DOE EPSCoR is located in the Office of Science and assists the Office by supporting basic and applied research and development across a wide range of interdisciplinary program areas including but not limited to: Advanced Scientific Computing Research, Basic Energy Sciences, Biological and Environmental Research, **Fusion Energy Sciences**, High Energy Physics and Nuclear Physics. It also supports research that is relevant to other DOE Program Offices, including but not limited to: the Office of Civilian Radioactive Waste Management; the Office of Electricity Delivery and Energy Reliability; the Office of Energy Efficiency & Renewable Energy; the Office of Environmental Management; the Office of Fossil Energy; the Office of Legacy Management; and, the Office of Nuclear Energy. The participation of these other programs is critical to the success of EPSCoR applications and developing understanding of these programs should be long-term objective of all EPSCoR applicants. Goals of DOE EPSCoR: a) improve the capability of designated **states** and territories to conduct sustainable and nationally competitive energy-related research; b) jumpstart infrastructure development in designated states and territories through increased human and technical resources, training scientists and engineers in energy-related areas; and c) build **beneficial relationships** between scientists and engineers in the designated states and territories with the 10 world-class laboratories managed by the Office of Science, leverage DOE national user facilities, and take advantage of opportunities for intellectual collaboration across the DOE system. Through broadened participation DOE EPSCoR seeks to provide the most comprehensive network of energy-related research across the nation. DOE EPSCoR requests an annual budget of approximately $8 million per year and posts Funding Opportunity Announcements (FOAs) every one to two years. Program Priorities: DOE EPSCoR is a science-driven, merit-based program that supports basic and applied research activities spanning the broad range of science and technology programs within DOE. In addition, the program places high priority on increasing the number of scientists and engineers in energy-related areas. The program places particular emphasis and importance of collaboration with young faculty, postdoctoral associates, graduate and undergraduate students with scientists from the DOE national laboratories where unique scientific and technical capabilities are present. The program supports the most meritorious proposals based on merit and peer review. To maximize the effectiveness of the program, the development of the science and engineering resources component is closely coupled with the research part of the program.

### A2: Preemption (Eggen ‘06 / Liu ’09)

#### 3) States are better at energy tech R&D, and can partner with national labs

Kathleen Sebelius and the Securing a Clean Energy Future Task Force, Former Governor of Kansas, Securing a Clean Energy Future, A Report for the National Governors Association as part of the Securing a Clean Energy Future Initiative, 2008, http://www.nga.org/files/live/sites/NGA/files/pdf/0807ENERGYRD.PDF

Intellectual resources in some ways overlap with industrial resources. This report draws the two distinctions between them: 1. Intellectual resources are considered to lie within universities, federal laboratories, and public-private cooperative ventures, as opposed to within industrial resources that generally are found in private firms. In some cases, these are cross-cutting because industry laboratories will cooperate with national laboratories and universities, including sharing facilities and scientists. 2. Intellectual resources generally contribute to the earlier stages of the innovation process (basic and applied research), whereas industrial resources are more heavily involved in later stages (development, demonstration, and deployment). Intellectual resources include a broad range of activities, capabilities, and skills. Within universities, for example, intellectual resources include human capital embodied in students and professors, the research lab infrastructure, and the expertise and training in specific scientific and technological disciplines. States with concentrations of technology firms or firms that employ advanced manufacturing have similar assets in private industry. The development of intellectual resources generally requires a longer time frame and provides benefits that are more difficult to quantify than those from the development of natural resources or industrial resources. The strength of intellectual resources largely derives from the development of networks of people and institutions that work on shared issues. These networks can be critical to the development of new industries, but require years or even decades to develop, making returns on state investments difficult to quantify. Intellectual resources, however, are often more important to a state’s long-term economic outlook than either industrial or natural resources. Strengths in specific industries now are not guaranteed to remain the same in the future. Natural resources are critical, but to effectively leverage them, states need a skilled workforce and technologically capable firms, both of which are generated and supported by strong intellectual resources. Universities Universities play an essential role in the process of clean energy RD&D. Many universities have developed expertise in clean energy-related fields through years of research, in large part funded by the federal government through the National Science Foundation, U.S. DOE, and U.S. Department of Defense, among others. Many universities now have portfolios of clean energy patents and work with established and emerging firms to develop new technologies. Because of the large capital costs and long timelines of clean energy RD&D, universities can most effectively contribute their expertise if they have additional support from outside sources. There are many examples of successful university-state partnerships in clean energy RD&D, including Oregon’s proposed National Wave Energy Research and Demonstration Center (Box 10, page 18), Connecticut’s Global Fuel Cell Center (Box 14, page 23), and North Carolina’s Advanced Transportation Energy Center (Box 23, page 31). In each of these cases, the university’s existing strengths (for example, electrochemical and battery research at the North Carolina center) were recognized and promoted by state government. Private funding is also instrumental in many university RD&D efforts. The largest recent example is the $500 million investment by BP, the global energy group, to create the Energy Biosciences Institute at the University of California, Berkeley; the University of Illinois, Urbana-Champaign; and Lawrence Berkeley National Laboratory. 29 BP’s goal is to tap the existing expertise at these institutions to develop the next generation of vehicle fuels, recognizing that investing in existing intellectual resources will likely provide faster and better results than attempting to invest internally to duplicate that expertise. Another prominent example of academic expertise attracting private funding is the Gulf Coast Carbon Center (GCCC), 30 managed by the Bureau of Economic Geology at the University of Texas (UT), Austin. The Bureau of Economic Geology has conducted cuttingedge research in geoscience since its founding in 1909; it doubles as the state’s Geological Survey. UT Austin, as a natural hub for RD&D in geologic carbon sequestration, was able to attract funding from Shell, Chevron, Schlumberger, and other private firms to create the GCCC, which is now a world player in carbon sequestration technologies. National laboratories The national laboratories 31 are an important intellectual resource for the nation, and for clean energy. All of the national labs have essentially evolved and expanded their expertise beyond their original missions and into clean energy. The National Renewable Energy Laboratory (NREL) in Golden, Colorado, is the primary national lab for clean energy RD&D. The following national labs are also working heavily in the area of clean energy: Oak Ridge National Lab, in Oak Ridge, Tennessee, originally established for nuclear research and production, now has expertise in research, development, demonstration, and evaluation in a variety of solar, wind power, hydropower, and biomass technologies. Sandia National Lab, in Albuquerque, New Mexico, also first established primarily for nuclear and defense research, now specializes in a number of solar technologies, as well as wind and geothermal power, at both the R&D and demonstration stages. Sandia also has a number of projects underway to develop more efficient distributed generation networks to enable power production from intermittent renewable sources. Los Alamos National Laboratory, in Los Alamos, New Mexico, has significant and long-standing programs in energy sciences, energy assessment and modeling, and—both domestically and internationally—clean energy and energy efficiency. Lawrence Berkeley National Laboratory, in Berkeley, California, in addition to sharing the focuses of Los Alamos National Laboratory, has programs in advanced photocell, fuel cell, clean combustion, advanced biofuels, energy modeling and market assessment, energy efficiency, building technologies, and end-use behavior. Argonne National Laboratory, in Argonne, Illinois, conducts research on semiconductor materials and on the life-cycle impacts and benefits of biofuel feedstocks and fuels. Brookhaven National Laboratory, in Upton, New York, conducts work on solar cell materials, fuel cells, and the future of the United States and global energy system. Pacific Northwest National Laboratory (PNNL), in Richland, Washington, has divisions researching the management of the nuclear energy fuel cycle, as well as linked energy-climate modeling and low-carbon energy systems. PNNL is also extensively involved in technology transfer from the national laboratories to both public and private ventures. Idaho National Laboratory (INL) is a science-based applied engineering national laboratory dedicated to supporting U.S. DOE’s missions in nuclear and energy research, science, and national defense. By 2015, INL aims to be the preeminent nuclear energy laboratory with synergistic, multiprogram capabilities and partnerships. The national laboratories are tremendous assets not only to the states in which they are located, but—because their mission is to serve the interest of the nation as a whole—to any state that secures funding or other support from them. A new partnership between NREL and the state of Hawaii aptly illustrates this (Box 8).

### A2: Tech-Transfers (GAO)

#### 2) Their evidence defines tech transfer as the transfer of developed tech to be commercialized – obviously not the CP

GAO 9 – United States Government Accountability Office, "Technology Transfer: Clearer Priorities and Greater Use of Innovative Approaches Could Increase the Effectiveness of Technology Transfer at Department of Energy Laboratories", June, http://www.gao.gov/assets/300/290971.html

The Department of Energy (DOE) spends billions of dollars each year at its national laboratories on advanced science, energy, and other research. To maximize the public’s investment and to foster economic growth, federal laws and policies have encouraged the transfer of federally developed technologies to private firms, universities, and others to use or commercialize. The American Recovery and Reinvestment Act of 2009 further emphasized the role of such technologies for addressing the nation’s energy, economic, and other challenges. Congress requested GAO to examine (1) the nature and extent of technology transfer at DOE’s laboratories; (2) the extent to which DOE can measure the effectiveness of its technology transfer efforts; and (3) factors affecting, and approaches for improving, DOE’s efforts. GAO analyzed documents and data and spoke with officials at DOE headquarters and all 17 DOE national laboratories.

#### 4) Even if you somehow conclude we are “tech transfer” – Their evidence is out-dated – The DOE has hired the first full time tech transfer coordinator since their evidence was written – and she solves

Tom Michael, Innovation’s Washington bureau chief, “Tech Transfer Awakens at DOE”, June/July 2012, http://www.innovation-america.org/tech-transfer-awakens-doe

Two years into the job, Karina Edmonds—the first-ever, fulltime technology transfer coordinator at the Department of Energy—seems to be hitting her stride. Edmonds, an aeronautical engineer who worked to beef up technology transfer at Caltech and NASA’s Jet Propulsion Laboratory before landing at DOE in April 2010, has injected new life into the previously listless DOE effort to move its cutting-edge science to the marketplace. It was about time. Congress mandated the creation of Edmond’s job in 2005. After a five-year lull, Edmonds was finally hired and is apparently shaking things up. The America’s Next Top Energy Innovator Challenge, a new innovation initiative that launched in May, was a success under Edmond’s guidance, attracting 14 companies that partnered with DOE’s national laboratories to launch innovative new businesses that tapped into DOE-generated technologies. To support these startups’ efforts, the competition made it easier, faster and less costly to obtain option agreements to license some of the 15,000 patents and patent applications held by DOE labs. Edmonds and DOE launched the second round of the challenge in February. The deadline for submissions is Dec. 10. In another stroke of good news for the a rejuvenated tech transfer effort at DOE, Edmonds said she is working to make sure that the federal department finally makes good on a provision in the 2005 law that requires the establishment of an Energy Technology Commercialization Fund. The money is supposed to amount to 0.9 percent of the budgets of the national laboratories. Edmonds said that instead of creating an independent fund within her office, she’s insisting that relevant divisions within the DOE, such as the Energy Efficiency and Renewable Energy office, set that amount of money aside within their own budgets for tech transfer activities. “We want the programs to be actively engaged in tech transfer to own the responsibility rather than just money that they send up to this one office and we decide how to spend it,” Edmonds said. She believes this meets the intent of the law. “I think what congress ultimately wants is an effective tech transfer program,” Edmonds said. “If we show that’s an effective way to manage those funds I think they will be okay with that.” In addition to new programs and policies, Edmonds said she’s working with DOE labs to foster a new overall climate of cooperation with respect to technology transfer. In the past, the national labs have been criticized for resisting entreaties to partner with industry. “We have to move from the gatekeeper mindset to facilitator, from looking at these technologies as intellectual property they must absolutely protect and guard under any circumstance to enabling technology to get out to the market as soon as possible,” Edmonds said. “I don’t think it was something they were not interested in doing, but there were certain barriers in the way that really prohibited them from fully supporting the creations out of the laboratory.” Edmonds said representatives from some large companies have complained as DOE tech transfer initiatives, under her leadership the past two years, have focused intently on small companies and startups. “When I came to DOE I found that startup creation was almost impossible,” Edmonds said. “What we try to do is remove barriers to company creation. Everything we’re doing greatly benefits established companies and everything we are doing for startups is also good for big established companies.” Another tech transfer initiative underway at DOE is an improvement on the way it handles Cooperative Research and Development Agreements, known as CRADAs in industry parlance. Edmonds said DOE is doing a “complete rewrite” of its CRADA policy and introducing a small, short-form (seven pages) CRADA for any work that costs less than $500,000. “The intellectual property is handled the same way, as are the approvals and even for companies that choose to use the standard boilerplate the approval is much faster,” she said. A year ago, Edmonds’ office did a formal assessment of the DOE CRADA process that identified bottlenecks in the process. They weren’t impressed. Some CRADA applications were taking about six months to receive approval. She said that time could be cut, for companies that are being responsive to DOE in the process, to 60 days—maybe even 45 days in the best-case scenario. “We know it’s ambitious but we also believe it’s doable,” Edmonds said. “Ambitious” and “doable” are two words we didn’t hear much a few years ago when talking about technology transfer at DOE. Edmonds said she’ll keep working to keep the adjectives in the department’s tech transfer vocabulary. “It makes a big difference when you have a dedicated person who is looking to improve the process and is an advocate for the labs and our stakeholders,” she said.

### A2: 50 State Fiat Bad

#### 2) Your email correspondent concludes it is a worthy debate

Hartwig 12 – Zach, Ph.D. Candidate in Plasma Physics and Fusion Energy – MIT, BS in Physics – Boston University, Email Exchange with Casey Harrigan, 10-23, http://msudebate.blogspot.com/2012/10/exchange-with-hartwig-2.html

It would be fascinating to researchthe juriprudence onthis issueto see how the courts have interpreted these clauses with respect to science; **however**, that's outside my scope. In principle, I think that state could sponsor fusion research; however, in practice and precedent, the federal government will almost exclusively fund fusion for the foreseeable future.

#### B) The NCSL conference on energy offers a forum for uniform action

Tom Whipple is a retired government analyst, “A gathering in Louisville”, August 11th 2010, http://www.energybulletin.net/stories/2010-08-12/gathering-louisville

Every year the National Conference of State Legislators (NCSL) holds a conference where legislators from all over the U.S. gather for updates on major policy concerns. This year the organization found that issues surrounding the future of nation's energy supply were becoming of such paramount importance to state governments that it set up a task force to study the issues; produced a report on meeting the energy challenges; and devoted a whole day prior to the annual meeting to an "Energy Policy Summit."

#### 4. Builds topic education – tests the key resolutional question of “USFG should”

Kay 12 (David, Cornell Community and Regional Development Institute, “Energy Federalism: Who Decides?”, July, http://devsoc.cals.cornell.edu/cals/devsoc/outreach/cardi/programs/loader.cfm?csModule=security/getfile&PageID=1071714)

Questions about energy production and consumption are acquiring renewed urgency in the 21st Century. **Among these questions are some that go to the heart of our nation’s system of federalism, as an underlying but ever-present friction mounts over the way in which decision making power has been divided between central and more locally distributed political units.** What is at stake? According to one author, **“the choice of regulatory forum often seems to determine the outcome of the controversy. That may explain why Americans have traditionally shed so much metaphorical and genuine blood deciding what are essentially jurisdictional disputes between governmental institutions.”**i

#### 7. Discussion about the states is a good thing – rising importance

Watkins 12 – Thesis for partial fulfillment of the requirements for the Degree of Bachelor of Arts with Departmental Honors in Economics at Wesleyan University [Miles, April 2012, “Party in the House? Examining the Effects of Political Control on State Government Spending,” Page 3-4, <http://wesscholar.wesleyan.edu/cgi/viewcontent.cgi?article=1796&context=etd_hon_theses>]

Focusing on American state governments, rather than those at the national or local levels, offers several methodological advantages. The states together provide a cross-section of data that is consistent over time, where all units face a “common institutional framework and cultural milieu” (Dye 1966 p. 11). This would not be available in a study of federal spending, and allows for the use of more powerful and precise econometric techniques; for example, I am able to eliminate from my regressions the perturbing effects of a state’s culture, geography, and political history. State data also trumps that of local governments, which suffer from incomplete and highly disaggregated information. Especially pertinent to my study is the fact that the majority of municipalities hold nonpartisan elections; this would prevent me from using an unbiased sample in my regressions (Ferreira & Gyourko 2009). Overall, little is sacrificed by choosing to study the states; the results of my study of state governments are largely applicable to local and federal ones as well, since in general there are great similarities in politics between different levels of American government (Gray et al. 1985 p. 89). Beyond those statistical issues, state public policy is also worthy of analysis in and of itself. States provide residents with crucial public goods and services, such as welfare, higher education, and transportation infrastructure. Further, in light of an increasingly polarized and gridlocked Washington, in the coming years state governments will likely take on more importance in determining the economic and social future of the United States (Katz & Bradley 2011).

## ITER [2:00]

**ITER Link 2NC**

***It’s zero sum --- the DoE says the link is true***

**DoE 12** ---US Department of Energy – Office of Science, E.J. Synakowski, Associate Director, Office of Science, Fusion Energy Sciences, “For the University Fusion Associates Town Hall Meeting” October 29, 2012, <http://fire.pppl.gov/APS-DPP_2012_Synakowski.pdf>, jj

 **The budget was zero sum; ITER grows; non-ITER hit hard**. You have asked, What does this mean? “What does this mean?”

 **Tough decisions were made**

 **Commitment to ITER was affirmed at a very high level**

 **All in an extraordinary budget environment in Washington**

#### DoE budget is zero sum

Armentrout 12 Charles J. Armentrout, Ann Arbor, 2012 May 02, the Last Tech Age, Fusion Wins Reprieve, <http://lasttechage.wordpress.com/2012/05/02/fusion-wins-reprieve/>, jj

Final note: It’s not over yet. The House Committee decisions are not the rule of the land. We almost certainly will not see the end until after the November elections, even though the budget starts in October. AND: This budget is being played as a zero sum game. By mandating more money here, the Department of Energy must reduce its support elsewhere. I feel bad about that, but if every program currently being supported were actually covertly slated to be discarded just as it reaches success, the truth must be that the U.S. has no energy research program.

***Even if there’s no actual tradeoff, Congress will use the plan as an excuse to cut ITER***

**PACE 8** (David, graduate student in the Department of Physics and Astronomy at UCLA, working on Ph.D. in experimental plasma physics, “The United States Will Probably Desert ITER Permanently,” January 5, <http://www.davidpace.com/physics/graduate-school/us-leave-iter.htm>)

The **collection of circumstances** now present do not bode well for ITER and they **encourage renewed concern over U.S. fusion and plasma research in general**. It seems that history is repeating itself with regard to our role in ITER. **An unwilling Congress, the lack of powerful supporters, and economic pressures are aligned against a U.S. presence in ITER**. The Government Accountability Office has highlighted both the need for more fusion Ph.D.'s in the workforce and the fact that as many of half of all plasma science and engineering Ph.D.'s leave the field (plain text, pdf). As a member of the group of graduate students in this field I can positively state that our discussions focus on events like this ITER cut and the uncertainty in funding for this type of research is a major motivation for moving to other sectors and very different careers. Supporting ITER encourages a new generation of plasma scientists as much as cutting it leads these same people to other fields.

**UQ---2NC**

***Political support for ITER funding now***

**Hand**, 7/24/**2012** (Eric – staff writer at Nature, US fusion in budget vice, Nature, p. <http://www.nature.com/news/us-fusion-in-budget-vice-1.11061>)

It seems that some **members of** the US **Congress are listening**. On 6 June, **the House** of Representatives **voted to boost ITER funding** and to support the domestic programme at almost 2012 levels. **The Senate’s version** of the bill, which has not yet been voted on, currently **agrees with the cuts in the Obama administration’s budget request** — but directs the DOE to explore the impact of simply withdrawing from ITER. US fusion researchers do not want that — yet. But if the 2014 budget looks at all like the 2013 one, Dean predicts, the knives will be out for ITER. “**They’re not trying to kill ITER just yet,” he says**. “If this happens again in 2014, I’m not so sure.”

***Link determines direction of uniqueness—ITER’s safe as long as domestic fusion stays flat***

**New York Daily News**, 4/13/**12**, Don’t let the sun set on fusion, peakoil.com/alternative-energy/dont-let-the-sun-set-on-fusion/

When it comes to fusion research, however — which could deliver boundless clean energy, if the scientists get it right — Obama is basically shipping jobs overseas.

**His budget for 2013 chops federal funding for American fusion labs**, including projects **at** New York’s own **Columbia University**, **then redirects that cash to** pay the U.S. share of **an international megaproject** under construction in France.

No matter how you slice it — economically, scientifically or politically — robbing Peter to pay Pierre makes little sense.

To be fair, **Obama is keeping a promise** made by President George W. Bush, who **committed support for the I**nternational **T**hermonuclear **E**xperimental **R**eactor a decade ago — **along with Europe, China, Russia, India, Japan and South Korea**.

Since **ITER stands to be the largest fusion experiment the world has ever known** — and just might solve humanity’s energy dilemma — **the U.S. can’t afford not to take part**.

**UQ – Other Countries Committed Now**

***U.S. presence pressures other nations to stay on-board.***

**Brumfiel**, June **2012** (Geoff, Fusion’s Missing Pieces, Scientific American, Vol. 306, Issue 6, p. EBSCO Host)

**Despite these setbacks** and the uncertain future of fusion energy as a whole, **it is difficult to find anyone familiar with ITER who thinks the machine will not get built. Peer pressure is one reason: "The French are in it and won't back out because the U.S. is in it and won't back out," Cochran says. Political visibility** for the countries involved -- and substantial penalties for pulling out early -- also **serves to keep the project moving, Tuinder observes**.

***Foreign political support for ITER collaboration is high***

**Shrivastav, 12** ( Work on track for world's first fusion reactor Snehlata Shrivastav, TNN Feb 3, 2012, <http://articles.timesofindia.indiatimes.com/2012-02-03/nagpur/31021067_1_fusion-reactor-international-thermonuclear-experimental-reactor-plasma-research>)

**India, one of the seven participating countries, is keeping pace with the development work assigned to it as part of the joint project to produce energy from fusion**, using deuterium and tritium, the two hydrogen isotopes, as fuel at the International Thermonuclear Experimental Reactor (**ITER**), said project director of India-ITER Shishir Deshpande.

The reactor **is expected to be ready by 2022** while 500MW power generation could take another decade. India was the last to join the experiment, the first of its kind effort, on the initiative of Anil Kakodkar, former Atomic Energy Commission chairman. Deshpande, from the Institute of Plasma Research, Gandhinagar, Gujarat, is ensuring that Indian scientists and industry deliver their work on time. The entire project is expected to cost about 13 billion Euro.

Speaking to TOI on the ambitious project, Deshpande said designing work on 'cryostat', the world's largest high vacuum cold storage vessel for the reactor, which India is making, has already been completed and procurement process has started. Deshpande, a Nagpur University (NU) alumnus from the physics department, was speaking to TOI while in the city to deliver the VN Thatte memorial lecture at Institute of Science on Thursday and NU physics department.

The ITER project coming up at Cadarache, France, would house a fusion reactor as big as a ten-storeyed building. It will try to fuse together two atoms as against fission, where atoms divide to create energy. The Tokamak, a device that houses the magnetic fields to contain the plasma (fourth state of matter similar to that present in the Sun) will also be one of the biggest and best Tokamaks.

"We are basically involved in designing and fabricating 7-8 major components of the reactor and developing certain diagnostic tools. India would begin delivering them by 2016. The work on other components are in prototyping or designing stage," said Deshpande.

Though the pre-project work on ITER began in 2005, **the seven participating countries**; European Union (**EU), Russia, USA, China, Japan, South Korea and India**, actually **signed a joint agreement** in November 2006, **and a body called as ITER organization was formally constituted** in 2007. The Indian government formally cleared the project and formed a special board in 2007. The construction work of the first building was started in 2010.

**EU is contributing the biggest share (45%) in the project**, which is expected to cost over 13-15 billion Euro (about Rs 78,000 crore) **while the other six partners are contributing about 9% each**, mostly in kind. Professor Osamu Motojima from Japan is the project's director general.

**STEM**

**2NC – Nuclear Workforce High**

***Status quo programs will fill the nuclear skills gap***

**GlobalData**, 7-11-20**12**, “The US Must Foster Nuclear Education to Support the Industry,” http://www.globaldata.com/PressReleaseDetails.aspx?PRID=245&Type=Industry&Title=Nuclear+Energy

According to the US Department of Labor, **employment of nuclear reactor operators is expected to grow** by 19% throughout 2008–2018. Alongside the need for growing staff numbers, the trend will also be caused by a new NRC regulation limiting shift durations for staff working at nuclear power plants. The requirement for trained nuclear staff will face additional increases from other nuclear industry sub-sectors such as power systems and heavy components manufacturing, which are predicted to see expansions in the near future. Neighboring Canada is facing a similar struggle, as a report published in 2008 by the Canadian Nuclear Association (CNA) estimates that around 38% of workers in the nuclear industry are above the age of 50, and therefore approaching retirement age. A significant increase in the hiring of new employees is expected in the Canadian nuclear industry to curb this upcoming demand, and it is essential that the government manages knowledge transfer between the new and the old employees in order to maintain a high level of professional understanding. July 2002 saw the Canadian government establish the University Network of Excellence in Nuclear Engineering (UNENE) to support the development of nuclear human resources in Canada. This establishment aimed to ensure the sustainable supply of nuclear workforce requirements through university education. “**We see a number of collaborative approaches to address the skills challenges in the nuclear power sector. Both the industry and the academe are expected to step up their efforts in developing a qualified nuclear workforce”,** Jennifer Santos, GlobalData’s Head Consultant observed.

***Govt will just give the workforce more cash***

Gene **Aloise**, Director, Natural Resources and Environment, GAO, April **12**, MODERNIZING THE NUCLEAR SECURITY ENTERPRISE: Strategies and Challenges in Sustaining Critical Skills in Federal and Contractor Workforces, http://www.gao.gov/assets/600/590488.pdf

According to NNSA officials, these five metrics are tracked very closely by M&O contractors at all sites, and attrition, employment acceptance rates, and pay and benefits comparability data are systematically collected at regular intervals enterprisewide. If any of these metrics indicate a problem in retention, for example, NNSA officials told us, **action would be taken to address it**. For example, these metrics were monitored very closely by NNSA and the M&O contractors at Los Alamos National Laboratory and Lawrence Livermore National Laboratory during their 2006 transition to a new M&O contract with less generous retirement and medical benefits. There were concerns that this change could lead to a spike in attrition among highly skilled staff that could in turn lead to difficulties in the laboratories meeting deadlines on project deliverables. Similarly, NNSA is now carefully watching the same metrics at Sandia National Laboratories because the M&O contractor substantially cut future retirement benefits that took effect for those employees who remained at the lab beyond the end of 2011. If the metrics indicate greater attrition than expected, the laboratory could adjust its recruiting strategies to hire more staff.

***Nuclear workforce inevitable—pay***

Gene **Aloise**, Director, Natural Resources and Environment, GAO, April **12**, MODERNIZING THE NUCLEAR SECURITY ENTERPRISE: Strategies and Challenges in Sustaining Critical Skills in Federal and Contractor Workforces, http://www.gao.gov/assets/600/590488.pdf

NNSA officials and M&O contractors told us that maintaining competitive total compensation packages—that is, combined salary and benefits—is crucial for achieving their strategies for recruiting, developing, and retaining the workforce with the skills necessary to sustain critical capabilities in the nuclear security enterprise, but that other factors are also useful in both attracting desirable candidates and mitigating attrition. For example, M&O contractor officials at Sandia National Laboratories told us that offering the highest salary is not required to attract top talent, but offering pay comparable to peer institutions is a necessity. Accordingly, NNSA officials work very closely with M&O contractors to ensure that contractor compensation remains comparable to other enterprise laboratories and plants, private laboratories, companies, and other government entities that recruit and try to retain similar talent. M&O contractors undertake compensation studies every year and comprehensive benefits evaluation surveys every 2 years. This compensation study is done using survey data from recognized regional, national, and international surveys as needed. Based on these data, M&O contractors may seek permission from NNSA to pay certain employees more by submitting a special request in the Compensation Increase Plan. If the plan is accepted by NNSA, salaries will be increased. In addition to raising salaries for M&O contractors to keep them competitive, NNSA will also authorize and pay for sign-on and retention bonuses, significant monetary recognition and awards programs, and special compensation packages for especially difficult-to-recruit and retain critical skills specialties. The biennial benefits evaluation compares the value of M&O contractor workforce benefits to 15 peer competitors for the same talent.

According to DOE policy,16 M&O contractors may offer benefits up to 105 percent of the value of peer institutions’ benefits.

NNSA officials and M&O contractors told us that other factors are useful in both attracting desirable candidates and mitigating attrition. For example, the weapons laboratories in particular can offer scientists and engineers access to state-of-the-art equipment—such as the National Ignition Facility at Lawrence Livermore National Laboratory—and the opportunity to do cutting edge research that cannot be done outside the enterprise due to national security restrictions. Similarly, for the three production plants located in relatively remote, nonmetropolitan locations—particularly Pantex, Y-12, and the Savannah River Site— attrition rates are lower among candidates with ties to the local area. For example, M&O contractor officials at Y-12 told us that they recruit locally to the extent possible, because, historically, employees from nearby communities have been less likely to seek opportunities that would require them to relocate. These officials added that the local community is familiar with Y-12, and that about 35 percent of new applicants are employee referrals.

**2NC – No Impact – Nuclear Deterrence**

***Conventional deterrence is more credible and effective against regional adversaries***

**Gormley 9** – Dennis Gormley, Senior Fellow in the James Martin Center for Nonproliferation Studies at the Monterey Institute for International Studies, Fall 2009, “The Path to Deep Nuclear Reductions: Dealing with American Conventional Superiority,” online: http://www.ifri.org/files/Securite\_defense/PP29\_Gormley.pdf

Of course, **the decided advantage that precision conventional weapons have over nuclear weapons is that an** **adversary knows full well that the U**nited **S**tates **is highly likely to use its conventional advantage** should its security interests become seriously threatened. **As for nuclear threats**, **the only ones that may prove salient are ones that threaten nuclear retaliation** **during an ongoing conventional war against a regional state in possession of a** small **nuclear capability**. But still, **U.S. reliance on precision conventional weapons represents the** **best form of deterrence** – pre-war and intra-war – if only **because of the declining value of the threat of nuclear use**. As previously noted, Paul Nitze argued in 1994 that nuclear weapons were unlikely to deter regional aggressors as well as precision conventional weapons, not least because of the growing effectiveness of non-nuclear options but also because **American presidents would be unwilling to use nuclear weapons**.22 Notably, after the 1991 Persian Gulf War, Colin Powell dismissed the utility to nuclear use, while his commander-in-chief, President George H.W. Bush, acknowledged in his memoir that he had ruled out a nuclear response in that war.23

# 1NR

**CP**

**A2: Feds K2 STEM (Kammen / Unistar / Sarewitz)**

***3) State funding attracts STEM***

Christopher **Lawson**, Physics Prof @ Alabama, Exec. Dir. Alabama EPSCoR, 3-22-**2012**, CQ Testimony

**EPSCoR** provides a mechanism to **address those geographical imbalances. The program has been a huge success, investments have generated growth in state economies, attracted students into STEM fields, and created a broader base of high tech research expertise**. NSF EPSCoR provides co planning meritorious proposed research and EPSCoR states and by infrastructure improvement awards to support academic research infrastructure and cyber infrastructure improvements in areas critical to the states' high tech economic development. **NSF EPSCoR infrastructure funding matched by the states to leverage the federal investments. In my home state of Alabama, NSF EPSCoR funding is generated revolutionary advancements** in science and engineering that have led to new business growth and high-paying jobs. NSF EPSCoR **funding has been vital for advancing students to STEM** ideas and research and introduce more than 2,000 students across Alabama to these science and technology and engineering concepts in one year alone. In a time when the President and Congress are working to engage students in STEM fields, **it only makes sense to build on this success and continue to fund the NSF EPSCoR program at the Administration's budget request of $158 million. This will ensure that states such as Alabama continue to develop a robust research infrastructure so that they can compete for Federal research grants and continue to prepare a skilled, high tech workforce capable of delivering innovation** in the future. Congress designed NASA EPSCoR to increase the research capacity of states with limited NASA R&D funding in areas related to NASA's mission. NASA EPSCoR funds both grants for Research Infrastructure Development and to seed research in critical research areas. Together, they attract students into STEM fields, allow more states to participate in NASA research enterprise, and provide opportunities for high tech economic growth in local communities nationwide. Like the NSF EPSCoR program, **states help increase the Federal benefit by matching funds**. Funding the NASA EPSCoR at the congressionally authorized level of $25 million is truly a win-win program for the states and our nation. At a time of economic challenges and tight budgets, **programs like EPSCoR that seek a broader distribution in research funding makes solid fiscal sense**. Limiting these resources to a few states and institutions is self defeating for our nation in the long run. NSF and NASA EPSCoR help all states to benefit from taxpayer investments and federal research and development, and they generate long term growth and a skilled workforce for the future. NSF and NASA EPSCoR stretch limited federal dollars further through state matching. Not only do states benefit from increased research capacity and growth, but our nation benefits from the rich and diverse pool of talent that our entire country can provide. In a time that 33 percent of all bachelors degree in China are in engineering, compared to 4.5 percent in the US, if we are going to remain globally competitive, instead of restricting ourselves to a few states and institutions, we need to be training and harnessing all of our nation's brainpower, and EPSCoR is working to achieve this goal.

**Space add on**

***Space propulsion can’t be a spinoff tech—explicitly funding fusion propulsion’s key***

**McCarthy, et al., 2** (Kathryn, director of Nuclear Science and Engineering at the Idaho National Engineering and Environmental Laboratory, Charles Baker, director of the Virtual Laboratory for Technology at UC San Diego, Edward Cheng, president of TSI Institute, and others, Nonelectric Applications of Fusion, Journal of Fusion Energy, December, Vol. 21, No. 3/4, Springerlink, p.147)

**Because the technical priorities are sufficiently different, an independent program directed at researching fusion propulsion separately**¶ **funded from the terrestrial fusion electric program would be needed to pursue space propulsion**. The two programs, however,¶ would have many overlaps in underlying physics and engineering, and would likely involve the same community of researchers. The DOE fusion program¶ should be responsive to any NASA request for support on evaluating (and subsequently developing) space fusion propulsion¶ systems. DOE could provide the management and technical expertise in fusion and plasma sciences, especially in¶ the early phases of the program. As a first step, we recommend that a joint NASA-DOE (with NASA in the lead, and providing funding for anything¶ more than “consultation” type of work) program be undertaken to perform conceptual studies of the potential and the feasibility of fusion for propulsion at the systems¶ level, and to develop a long-range research and development plan for its development. **The pursuit of the** two synergistic but **independent**¶ **applications will stimulate researchers** and management to think “out of the box,” with the potential for new¶ discoveries for both approaches. In particular, we suggest that the intellectual challenge of deep space exploration will inspire young scientists to enter¶ fusion and plasma science, thus enriching the future work force for both applications.

***We can survive here on Earth --- not try or die --- our impacts outweigh***

We have 5 billion years to get off the rock --- intervening actors and technological fixes will prevent their vague laundry list of scenarios from killing us off. Our impacts are more urgent and more likely.

Try or die calculus is also incoherent --- we could still be fried by gamma ray bursts in space, and there are other hidden disads to leaving Earth that could cause extinction if we get off the rock.

**Williams 10 –** (Lynda, M.S. in Physics and a physics faculty member at Santa Rose Junior College, “Irrational Dreams of Space Colonization,” Peace Review: A Journal of Social Justice, 22.1, Spring, pg 7-8)

**According to scientific theory, the destruction of Earth is a certainty**. About five billion years from now, when our sun exhausts its nuclear fuel, it will expand in size and envelope the inner planets, including Earth, and burn them into oblivion. **So yes, we are doomed, but we have five billion years, plus or minus a few hundred million, to plan our extraterrestrial escape. The need to colonize the moon or Mars to guarantee our survival is not pressing.** **There are** also real **risks due to collisions with asteroids** and comets, **although none are of immediate threat and do not necessitate extraterrestrial colonization.** **There are many Earth-based technological strategies that can be developed in time to mediate such astronomical threats, such as gravitational tugboats that drag the objects out of range**. **The solar system could also potentially be exposed to galactic sources of highenergy gamma ray bursts that could fry all life on Earth; any moon or Mars base would face a similar fate**. Thus, human-based **colonies on the moon or Mars would not protect us from any of these astronomical threats in the near future. Life on Earth is more urgently threatened by the destruction of the biosphere and its life-sustaining habitat due to environmental catastrophes such as climate change, ocean acidification, disruption of the food chain, bio-warfare, nuclear war, nuclear winter, and myriads of other manmade doomsday possibilities**. **If we accept these threats as inevitabilities on par with real astronomical dangers and divert our natural, intellectual, political, and technological resources from solving these problems into escaping them, will we be playing into a self-fulfilling prophesy of our own planetary doom**? Seeking spacebased solutions to our earthly problems may actually exacerbate the planetary threats we face. This is the core of the ethical dilemma posed by space colonization: should we put our resources into developing human colonies on other worlds to survive natural and manmade catastrophes, or should we focus all of our energies on solving and mitigating the problems that create these threats on Earth?

**pltx**

**1NR Overview --- India**

***Indo Pak war outweighs --- causes extinction***

**Robock and Toon ‘09** [Alan and Owen Brian, “Local Nuclear War, Global Suffering”, Scientific American, <http://climate.envsci.rutgers.edu/pdf/RobockToonSciAmJan2010.pdf>]

***\*we don’t endorse ableist language***

 Twenty-five years ago international teams of scientists showed that **a nuclear war between the U.S. and the Soviet Union could produce a “nuclear winter.” The smoke from vast fires started by bombs dropped on cit­ies and industrial areas would envelop the planet and absorb so much sunlight that the earth’s sur­face would get cold, dark and dry, killing plants worldwide and eliminating our food supply. Sur­face temperatures would reach winter values in the summer.** International discussion about this prediction, fueled largely by astronomer Carl Sa­gan, forced the leaders of the two superpowers to confront the possibility that **their arms race endangered not just themselves but the entire hu­man race**. Countries large and small demanded disarmament. Nuclear winter became an important factor in ending the nuclear arms race. Looking back later, in 2000, former Soviet Union leader Mikhail S. Gorbachev observed, “Models made by Russian and American scientists showed that **a nuclear war would result in a nuclear winter that would be extremely destructive to all life on earth**; the knowledge of that was a great stimulus to us, to people of honor and mo­rality, to act.” Why discuss this topic now that the cold war has ended? Because **as other nations continue to acquire nuclear weapons, smaller, regional nu­clear wars could create a similar global catastro­phe.** New analyses reveal that a **conflict be­tween India and Pakistan**, for example, **in which 100 nuclear bombs were dropped on cities and industrial areas—only 0.4 percent of the world’s more than 25,000 warheads—would produce enough smoke to ~~cripple~~ global agriculture. A regional war could cause widespread loss of life even in countries far away from the conflict.**

***And, relations are key to accessing every impact***

**Asia Society Task Force ‘09**[Delivering on the Promise: Advancing US Relations With India, January, <http://www.asiasociety.org/policy-politics/task-forces/delivering-promise-advancing-us-relations-india>, Acccessed, 9-19-09, p. 7-8]

India matters to virtually every major foreign policy issue that will confront the United States in the years ahead. A broad-based, close relationship with India will thus be necessary to solve complex global challenges, achieve security in the critical South Asian region, reestablish stability in the global economy, and overcome the threat of violent Islamic radicalism which has taken root across the region and in India. The members of this task force believe that the US relationship with India will be among our most important in the future, and will at long last reach its potential for global impact—provided that strong leadership on both sides steers the way. The new relationship rests on a convergence of US and Indian national interests, and never in our history have they been so closely aligned. With India, we can harness our principles and power together to focus on the urgent interconnected challenges of our shared future: economic stability, expanded trade, the environment and climate change, innovation, nonproliferation, public health, sustainability, and terrorism. Together our two countries will be able to take on some of the most vexing problems facing the world today, and improve the lives and security of our citizens in doing so. But to get there, we must set broad yet realistic goals to be shared by both countries.

***Immigration liberalization key to nuclear renaissance***

**Hoskin Davis 08** Management Consulting Firm, provides strategic workforce planning, change management and executive search services, “Staffing the Nuclear Renaissance” online, jj

It is generally believed that over the next twenty years **demographic trends will produce a serious personnel supply-demand gap in the developed world, particularly in the United States. We have been studying the situation in the nuclear power industry, which is poised for a renaissance**. This industry provides an interesting case study of what other industries may face and what kinds of solutions they should embrace.

The **nuclear power talent supply constraints are caused by several factors**. **First and foremost is the aging workforce as the baby boom generation nears retirement. Birth rates in developed countries have been historically low. There has been a softening in our educational system’s emphasis on math and science education and lower enrollments in these majors relative to, say, the days of the space race.**

In addition, **cultural trends have emphasized the virtues of a four-year college degree and de-emphasized the importance of technical and craft careers. Plumbers, mechanics, welders, pipe-fitters, electricians, construction workers, and the like are not viewed as great occupations, even though the pay rates are very substantial**. **Finally, in spite of the forces propelling immigration,** **security concerns since 9/11 have created real restrictions on the international movement of labor, particularly for high-security endeavors such as nuclear plant construction.**

***CIR solves the deficit***

**Tucker 10** Cynthia is a columnist for The Atlanta Journal-Constitution. “We need immigrants to help pay the deficit,” Nov 19, <http://blogs.ajc.com/cynthia-tucker/2010/11/19/we-need-immigrants-to-help-pay-the-deficit/>

**Recommendations for taming the deficit include** raising the retirement age, raising the federal gas tax and ending the mortgage interest deduction for homeowners. Ouch!¶ But there is **a palliative** **that would ease the pain: Put 11 million illegal immigrants on a path to legalization**. And don’t touch birthright citizenship!¶ Yes, you heard that right: **Granting legal residency to illegal immigrants will eventually help sop up some of the federal budget’s red ink.** I know that’s counterintuitive since so many citizens have come to believe that Mexican landscapers and Guatemalan maids are a drain on the treasury. But the fact is **that their relative youth is just what the U.S. economy needs.**¶ **The explosion of the long-term deficit is largely the consequence of an aging population, with more retirees depending on taxes from fewer workers.** While the recession, two unfunded wars and Bush-era tax cuts fueled the immediate deficit, **a tsunami of long-term red ink will swamp the budget** in about ten years, **as a massive wave of baby boomers leaves the workplace**.¶ **So we need as many younger workers as we can find to help support the coming crush of senior citizens**. The U.S. is lucky enough to have a higher birthrate than many other Westernized democracies, even among native-born women. **Immigrants are an added demographic bonus.**¶ “When some people think of immigrants, they think of people coming in and immediately absorbing our resources,” said Emory economist Jeffrey Rosensweig. “**Most immigrants come here to work. They’re young workers, and they’re paying taxes.” Why not add all of them to the federal tax rolls?**

***Deficit reduction key to prevent economic collapse, abrupt retrenchment and great power war***

**Khalilzad 11** — Zalmay Khalilzad, the one and only, was the United States ambassador to Afghanistan, Iraq, and the United Nations during the presidency of George W. Bush and the director of policy planning at the Defense Department from 1990 to 1992. National Review Online, 2-8, The Economy and National Security, <http://www.nationalreview.com/articles/259024/economy-and-national-security-zalmay-khalilzad?pg=3>, jj

Today, **economic and fiscal trends pose the most severe long-term threat to the United States’ position as global leader**. While the United States suffers from **fiscal imbalances** and low economic growth, the economies of rival powers are developing rapidly. The continuation of these two trends **could lead to a shift from American primacy toward a multi-polar global system, leading in turn to increased geopolitical rivalry and even war among the great powers.**

**The current recession is the result of a deep financial crisis**, not a mere fluctuation in the business cycle. Recovery is likely to be protracted. **The crisis was preceded by the buildup over two decades of enormous amounts of debt throughout the U.S. economy** — ultimately totaling almost 350 percent of GDP — and the development of credit-fueled asset bubbles, particularly in the housing sector. When the bubbles burst, huge amounts of wealth were destroyed, and unemployment rose to over 10 percent. **The decline of tax revenues and massive countercyclical spending put the U.S. government on an unsustainable fiscal path**. **Publicly held national debt rose from 38 to over 60 percent of GDP in three years.**

**Without** faster economic growth and **actions to reduce deficits, publicly held national debt is projected to reach dangerous proportions**. **If interest rates were to rise significantly, annual interest payments** — which already are larger than the defense budget — **would crowd out other spending or require substantial tax increases that would undercut economic growth**. Even worse, **if unanticipated events trigger what economists call a “sudden stop” in credit markets for U.S. debt, the United States would be unable to roll over its outstanding obligations, precipitating a sovereign-debt crisis that would almost certainly compel a radical retrenchment of the United States internationally.**

**Such scenarios would reshape the international order**. **It was the economic devastation of Britain and France** during World War II, as well as the rise of other powers, **that led both countries to relinquish their empires**. In the late 1960s, British leaders concluded that they lacked the economic capacity to maintain a presence “east of Suez.” Soviet economic weakness, which crystallized under Gorbachev, contributed to their decisions to withdraw from Afghanistan, abandon Communist regimes in Eastern Europe, and allow the Soviet Union to fragment. **If the U.S. debt problem goes critical, the United States would be compelled to retrench, reducing its military spending and shedding international commitments.**

We face this domestic challenge while other major powers are experiencing rapid economic growth. Even though countries such as China, India, and Brazil have profound political, social, demographic, and economic problems, their economies are growing faster than ours, and this could alter the global distribution of power. **These trends could in the long term produce a multi-polar world. If U.S. policymakers fail to act** and other powers continue to grow, **it is not a question of whether but when a new international order will emerge. The closing of the gap between the United States and its rivals could intensify geopolitical competition among major powers, increase incentives for local powers to play major powers against one another, and undercut our will to preclude or respond to international crises because of the higher risk of escalation.**

**The stakes are high. In modern history, the longest period of peace among the great powers has been the era of U.S. leadership**. By contrast, **multi-polar systems have been unstable, with their competitive dynamics resulting in frequent crises and major wars among the great powers. Failures of multi-polar international systems produced both world wars.**

**American retrenchment could have devastating consequences. Without an American security blanket, regional powers could rearm in an attempt to balance against emerging threats**. Under this scenario, **there would be a heightened possibility of arms races, miscalculation, or other crises spiraling into all-out conflict**. Alternatively, in seeking to accommodate the stronger powers, weaker powers may shift their geopolitical posture away from the United States. Either way, **hostile states would be emboldened to make aggressive moves in their regions.**

As rival powers rise, **Asia in particular is likely to emerge as a zone of great-power competition**. **Beijing’s economic rise has enabled a dramatic military buildup focused on acquisitions of naval, cruise, and ballistic missiles, long-range stealth aircraft, and anti-satellite capabilities**. **China’s strategic modernization is aimed, ultimately, at denying the United States access to the seas around China. Even as cooperative economic ties in the region have grown, China’s expansive territorial claims** — and provocative statements and actions following crises in Korea and incidents at sea — **have roiled** its **relations** with South Korea, Japan, India, and Southeast Asian states. Still, **the United States is the most significant barrier facing Chinese hegemony and aggression.**

Given the risks, **the United States must focus on restoring its economic and fiscal condition** while checking and managing the rise of potential adversarial regional powers such as China. While we face significant challenges, the U.S. economy still accounts for over 20 percent of the world’s GDP. American institutions — particularly those providing enforceable rule of law — set it apart from all the rising powers. Social cohesion underwrites political stability. U.S. demographic trends are healthier than those of any other developed country. A culture of innovation, excellent institutions of higher education, and a vital sector of small and medium-sized enterprises propel the U.S. economy in ways difficult to quantify. Historically, Americans have responded pragmatically, and sometimes through trial and error, to work our way through the kind of crisis that we face today.

**The policy question is how to enhance economic growth and employment while cutting discretionary spending** in the near term and curbing the growth of entitlement spending in the out years. Republican members of Congress have outlined a plan. Several think tanks and commissions, including President Obama’s debt commission, have done so as well. Some consensus exists on measures to pare back the recent increases in domestic spending, restrain future growth in defense spending, and reform the tax code (by reducing tax expenditures while lowering individual and corporate rates). These are promising options.

The key remaining question is whether the president and leaders of both parties on Capitol Hill have the will to act and the skill to fashion bipartisan solutions. Whether we take the needed actions is a choice, however difficult it might be. It is clearly within our capacity to put our economy on a better trajectory. In garnering political support for cutbacks, the president and members of Congress should point not only to the domestic consequences of inaction — but also to the geopolitical implications.

As the United States gets its economic and fiscal house in order, it should take steps to prevent a flare-up in Asia. The United States can do so by signaling that its domestic challenges will not impede its intentions to check Chinese expansionism. This can be done in cost-efficient ways.

While China’s economic rise enables its military modernization and international assertiveness, it also frightens rival powers. The Obama administration has wisely moved to strengthen relations with allies and potential partners in the region but more can be done.

Some Chinese policies encourage other parties to join with the United States, and the U.S. should not let these opportunities pass. China’s military assertiveness should enable security cooperation with countries on China’s periphery — particularly Japan, India, and Vietnam — in ways that complicate Beijing’s strategic calculus. China’s mercantilist policies and currency manipulation — which harm developing states both in East Asia and elsewhere — should be used to fashion a coalition in favor of a more balanced trade system. Since Beijing’s over-the-top reaction to the awarding of the Nobel Peace Prize to a Chinese democracy activist alienated European leaders, highlighting human-rights questions would not only draw supporters from nearby countries but also embolden reformers within China.

**Since the end of the Cold War, a stable economic and financial condition at home has enabled America to have an expansive role in the world. Today we can no longer take this for granted. Unless we get our economic house in order, there is a risk that domestic stagnation** in combination with the rise of rival powers **will undermine our ability to deal with growing international problems. Regional hegemons in Asia could seize the moment, leading the world toward a new, dangerous era of multi-polarity.**

**1NR A2: Relations resilient/Immigration Not Key**

***\*\*\*Relations collapse inevitable without immigration liberalization***

--- even if the overall relationship is inevitable cooperation isn’t

**Davis ’10** (Ted, School of Public Policy @ George Mason University, Association for Public Policy Analysis and Management, 2/18-20, “The Global Dynamic: of High-Skill Migration: The Case of U.S./India Relations”, https://www.appam.org/conferences/international/maastricht2010/sessions/downloads/389.1.pdf)

There is no reason to think that the present system of governing migration is optimal. Migration is a dynamic process, while the migration policy-making machinery is slow and cumbersome. The possibility that policy-makers will fail to capitalize on opportunities for mutual gain among sending and receiving countries is especially large for high-skill migration. At first glance, the case of **India – U.S. relations** would appear to contradict this point. As noted, both India and the U.S. have **experienced significant benefits from migration and circulation**. Yet many Indians still live in poverty and many Americans see India, its immigrants and offshore services, as a threat to their jobs and wages. Thus there is a **growing tension** between these countries that could **impede, if not derail**, further progress. Absent a program of cooperation, and perhaps exacerbated by the economic downturn, there is a risk that each country would be inclined to act unilaterally in pursuit of its own interests. However, these typically protectionist or nationalistic actions may impede the flow of immigrants, but it could impede the flow of ideas, reduce knowledge spillovers, and ultimately inhibit innovation and growth. Cooperation on migration offers an opportunity for countries to address the tensions that arise from immigration while opening avenues for pursuing common objectives and mutual prosperity. Though it may be desirable to consider a common system of migration across countries that transcend bilateral arrangements, such a system may not be able to address the unique dynamics that exist between countries. Nor should these relationships be viewed uniformly. Differences exist between sectors, such as technology services and medical services that call for their own strategies. This paper represents only a beginning point for understanding these ideas. Further research is planned to explore high-skill migration, the conditions that distinguish sectoral and country characteristics that contribute to the diverse nature of migration, and the varying governance mechanisms and their abilities to produce win-win results for high-skill migrants, domestic workers, firms, and countries.

**A2: deterrence checks**

***Their ev assumes India pays attention to the US deterrent --- wont happen in a world without rels --- Escalation is highly probable.***

**Geller 2005** (Daniel S. – Professor and Chair of the Department of Political Science at Wayne State University, The India-Pakistan Conflict: An Enduring Rivalry, Ed. T. V. Paul, p. 99)

In fact, **both the May-July 1999 military engagement** between India and Pakistan over Kashmir **and the crisis of December 2001-June 2002** after the terrorist attack on the Indian Parliament **mirrored the conflict escalation pattern for nuclear-armed states**. Each side initiated troop mobilization and general military alerts, coupled with the evacuation of civilians from border-area villages. **However, the outcome of the future confrontations for India and Pakistan may not adhere to the pattern established by other nuclear dyads. Elements are present in this dyad that were largely absent between other nuclear-armed antagonists and that make the escalation of war more probable. Among those factors are the presence of a contiguous border between India and Pakistan, a history of multiple wars, and an ongoing territorial dispute. These factors**, among others,79 **increase the likelihood that an Indo-Pakistani dispute will turn violent and that the violence will escalate** to war **irrespective of the presence of nuclear weapons**.

**A2: Obama Uses XO**

***Obama won’t do major immigration changes through XOs***

Mark **Krikorian**, National Review Online, 8/15/**12**, The president’s unconstitutional DREAM amnesty gets rolling., cis.org/OpedsandArticles/DREAM-Amnesty-Begins-Krikorian-National-Review

**The president** **knows what he’s doing is unconstitutional**. We don’t have to read his mind to know this — he’s said it repeatedly. In July of last year, **he told** the National Council of **La Raza, “The idea of doing things on my own is very tempting**, I promise you, not just **on immigration reform.** But that’s not how our system works. That’s not how our democracy functions.” In September he told some journalists: I just have to continue to say **this notion that** somehow **I can just change the laws unilaterally is just not true**. We are doing everything we can administratively. But the fact of the matter is there are laws on the books that I have to enforce. And I think **there’s been a great disservice done to the cause of** getting the DREAM Act passed and getting **comprehensive immigration passed by perpetrating the notion that somehow**, by myself, I **can go and do these things. It’s just not true.**

***XO can’t solve the impact***

Ben **Winograd**, Immigration Impact, 8/15/**12**, Busting Myths About Deferred Action , immigrationimpact.com/2012/08/15/busting-myths-about-deferred-action/

Myth: Deferred action is “amnesty.” As we explained on Monday, **deferred action is not “amnesty**.” Recipients of deferred action are neither placed on a path to citizenship nor given any formal immigration status. Even though the government has temporarily pledged not to deport them, and they are considered to be lawfully present, **they have no legal “right” to remain in the country**. They cannot sponsor family members to come to the United States; may not travel abroad without receiving advance permission from the government; and do not receive a “green card.” Myth: Deferred action provides “immunity” from deportation. Many commentators have said that recipients of deferred action will receive “immunity” from deportation, implying that the government may not revoke the protection. In truth, **deferred action is a purely discretionary form of relief that can be rescinded at any time** by this or any future administration. Myth: Deferred action will allow undocumented immigrants to get jobs that could have gone to unemployed natives. Most of the **immigrants** who are currently or **potentially eligible for deferred action are** still **in school** (K-12) **and will not be competing for jobs** against anyone. In fact, **only around half a million are not currently in school, which amounts to** between **0.3**% and 0.5% **of the total U.S. workforce**. Moreover, the DACA initiative will enable more undocumented youth to go to college and then to join the labor force as skilled workers. And economists have found that highly educated immigrant workers are not in job competition with the vast majority of native-born workers.

**2NC/1NR – UQ**

***CIR will pass now --- extend Boston Herald --- Obama’s leak was a savvy maneuver to keep the heat on the GOP --- they are coming around now --- prefer the direction of the link --- PC creates momentum***

Steven **Benen 2/6/13**, MSNBC-the Maddow Blog, <http://maddowblog.msnbc.com/_news/2013/02/06/16868677-defining-the-extremes-in-the-immigration-debate>, jj

At the surface, **there's ample reason for optimism on c**omprehensive **i**mmigration **r**eform. President **Obama is investing considerable political capital into the issue**; **the public strongly supports the reform efforts; a bipartisan bill is already progressing in the Senate; and every Republican strategist and consultant is warning the party not to further alienate the fastest-growing voting constituency in the country**.

**Even** House Speaker John **Boehner** (R-Ohio) **recently declared, "This issue has been around far too long. A comprehensive approach is long overdue, and I'm confident that the president, myself, others can find the common ground to take care of this issue once and for all."**

***GOP will cave on citizenship in the status quo***

**Narayanswamy 2/13**/2013, Anupama, Projects Editor for Real Time Investigations, a Sunlight Foundation Project, former researcher with the Center for public Integrity; “Key players in immigration debate have support of special interests,” Sunlight Foundation, <http://reporting.sunlightfoundation.com/2013/immigration-reform/>

On the Republican side, **gang-of-eighters** Jeff **Flake**, R-Ariz. **and** Lindsey **Graham**, R-S.C., **each worked on immigration** reform bills **in the past. Despite indication from Republican rank and file that any provision to grant citizenship to undocumented people will not see the light of day, the pair, joined by** Sen. John **McCain**, R-Ariz., **have indicated they believe the GOP is warming up to the idea and will come around**. McCain received $17 million from the sectors most likely to be involved in the immigration talks, although a vast majority of the money came when he was running for President in 2008. Flake has received more than $1.2 million over the years from the industry and Graham received $2.36 million.

***Obama pushing --- it’s bipartisan***

Katrina **Trinko, 2/19/13**, National Review, Rubio Still Optimistic about Bipartisan Immigration Reform, <http://www.nationalreview.com/corner/341070/rubio-still-optimistic-about-bipartisan-immigration-reform-katrina-trinko>, jj

Despite the flurry of negative press coverage suggesting that immigration reform is in jeopardy, **the Rubio team remains optimistic that bipartisan legislation can pass.**

While Senate Republicans who aren’t part of the immigration Senate gang have been fairly quiet on the topic of immigration, **Rubio’s team stresses that the legislation** — which won’t be released until March — **is not dead**. **“Private conservations have been very positive**,” says Rubio press secretary Alex Conant of other Republican senators. “People are understandably waiting to see the legislation before they commit one way or the other.” But the White House immigration plan that was leaked this weekend didn’t help. “To the extent we’re trying to build a coalition of conservatives who will support this plan, conservatives are going to be less likely to want to support it if they think President Obama’s just going to pull the rug out from underneath us on it,” says Conant.

Today President Obama called Rubio, who is in the Middle East, to talk immigration. “Senator Rubio appreciated receiving President Obama’s phone call to discuss immigration reform late tonight in Jerusalem,” said Rubio’s office in a statement. “**The senator told the president that he feels good about the ongoing negotiations in the Senate, and is hopeful the final product is something that can pass the Senate with strong bipartisan support.”**

**Obama also talked to Rubio’s fellow immigration-gang members Senators John McCain and Lindsey Graham, and plans to place a call to Senator Jeff Flake.**

**PC Key – General**

***PC is key to immigration***

Chris **Weigant**, Political writer, **1/23**/13 [“Handicapping Obama's Second Term Agenda,” HuffPost, http://www.huffingtonpost.com/chris-weigant/obama-second-term\_b\_2537802.html]

The second big agenda item is immigration reform. President **Obama holds virtually all the cards, politically,** on this one. **All Republicans who can read** either **demographics or polling numbers know full well that this may be their party's last chance not to go the way of the Whigs. Their support among Latinos is dismal, and even that's putting it politely.** Some Republicans think they have come up with a perfect solution on how to defuse the issue, but they are going to be proven sadly mistaken in the end, I believe. **The Republican plan will be announced by Senator Marco Rubio at some point, and it will seem to mirror the Democratic plan -- with one key difference. Republicans -- even the ones who know their party has to do something on the immigration problem -- are balking at including a "path to citizenship**" for the 11 million undocumented immigrants who are already in America.¶ **The Republicans are trying to have their cake and eat it too -- and it's not going to work**. "Sure," they say, "we'll give some sort of papers to these folks, let them stay, and even let them work... but there's no need to give them the hope of ever becoming a full citizen." This just isn't going to be good enough, though. There are essentially two things citizens can do which green card holders cannot: serve on juries, and vote. The Republicans are not worried about tainted juries, in case that's not clear enough.¶ **Republicans will bend over backwards in an effort to convince Latinos that their proposal will work out just fine for everyone.** Latinos, however, aren't stupid. **They know that being denied any path to citizenship equals an effort to minimize their voice** on the national political stage. **Which is why, as I said, Obama holds all the cards in this fight. Because this is the one issue in his agenda which Republicans also have a big vested interest in making happen. Obama and the Democrats will,** I believe, **hold firm on their insistence on a path to citizenship**, **and** I think **a comprehensive immigration [CIR] bill will likely pass** some time this year, perhaps before the summer congressional break. **The path to citizenship** it includes **will be** long, expensive and **difficult** (Republicans will insist on at least that), **but it will be there**.¶ On gun control, I think **Obama** will win a partial victory. On immigration, I think he **will win an almost-total victory.** On global warming, however, he's going to be disappointed. In fact, I doubt -- no matter how much "bully pulpiting" Obama does -- that any bill will even appear out of a committee in either house of Congress. This will be seen as Obama's "overreach" -- a bridge too far for the current political climate. Anyone expecting big legislative action on global warming is very likely going to be massively disappointed, to put it quite bluntly. In fact, Obama will signal this in the next few months, as he approves the Keystone XL pipeline -- much to the dismay of a lot of his supporters.¶ Of course, I could be wrong about any or all of these predictions. I have no special knowledge of how things will work out in Congress in the immediate future. I'm merely making educated guesses about what Obama will be able to achieve in at least the first few years of his second term. **Obama has a lot of political capital right now, but that could easily change soon. The House Republicans seem almost demoralized right now, and Obama has successfully splintered them** and called their bluff on two big issues already -- **but they could regroup** and decide to block everything the White House wants, and damn the political consequences. **Unseen issues** will pop up both on the domestic and foreign policy stages, as they always do. But, for now, this is my take on how the next few years are going to play out in Washington. Time **will tell whether I've been too optimistic** or too pessimistic **on** any or all of **Obama's** main **agenda items**. We'll just have to wait and see.

**A2: General Thumpers – Top of Docket**

***CIR will pass --- top of the docket --- before gun control and economic issues***

**Pimentel 2/15/13**, JOSEPH PIMENTEL | AJPRESS, 15 FEBRUARY 2013, Asian Journal, Proponents of comprehensive immigration reform hope for resolution in August, <http://www.asianjournal.com/community/community-news/19469-proponents-of-comprehensive-immigration-reform-hope-for-resolution-in-august.html>, jj

Comprehensive immigration reform has been a polarizing issue, mired in Washington politics for years with both sides unable to get anything done. **This year it appeared CIR would once again take a backseat as other issues like gun control, and the economy have been placed on top.**

**Heading into his second term**, President Barack **Obama has placed immigration reform on top of his agenda** -- **doing a speech about the issue in Las Vegas and mentioning it again during his State of the Union address.**

“We know what needs to be done,” said Obama during his state of the union speech. “**As we speak, bipartisan groups in both chambers are working diligently to draft a bill**, and I applaud their efforts. Now let’s get this done. Send me a comprehensive immigration reform bill in the next few months, and I will sign it right away.”

**Obama is looking at his legacy and leading the charge on this issue**, said Kelley.

Frank Sharry of America’s Voice, an immigration policy group, said **unlike years past when Republicans and Democrats constantly butted heads over the issue, now “both parties have a political imperative to get comprehensive immigration reform passed the goal line**.”

Sharry said **Democrats realize the growth of Asian and Latino voters that deeply care about immigration issue and if they want to continue to receive their support, they have to act on passing a bill.**

**For Republicans**, Sharry said, **passing a CIR bill would “regain their competitiveness with the fastest growing groups in the country.”**

***\*\*\*Obama has priced in the rest of his agenda and will get immigration done – a new contentious topic ruins his strategy***

Prefer this ev, their ev only takes into account pieces of the agenda in isolation, this ev is assumptive of whole docket

**Zeleny**, writer for International Herald Tribune, **1/24/2013**

(Jeff, “For Obama, an ambitious agenda faces ticking clock,” Lexis)

The State of the Union address that Mr. **Obama** will deliver to Congress on Feb. 12 will offer the most definitive road map yet for how the White House **will set priorities in his second term** as well as how it intends **to avoid** **becoming mired in a heated debate over one contentious topic** **to the detriment of the full agenda**. ''There's no doubt you want to get off to a strong start, and we've got a pretty big dance card,'' said David Plouffe, a senior adviser to Mr. Obama who is leaving the White House this week. **He ticked through a list of agenda items that included guns, immigration and fiscal issues, but he disputed the suggestion that one item would overtake the others. ''We clearly have this moment where we can get immigration done,'' Mr. Plouffe added**. ''If we don't get it done, then shame on us. **We've got to seize this opportunity.''**

**A2: Sequestration**

***Their WP card does NOT say sequester --- no new 1ar cards on it --- I’m going to cover my bases anyway***

***Obama not spending PC on sequester***

**Newsmax, 2/19/13**, GOP Stands Firm Against Obama on Averting Sequester, <http://www.newsmax.com/Newsfront/Obama-sequester-ryan-gop/2013/02/19/id/490893>, jj

**Obama has been a detached leader who has been unable to provide the necessary leadership in Washington on pressing spending issues**, Rep. Jack Kingston told Newsmax.

**“He's still in campaign mode**,” said the Georgia Republican. “I think the president has no credibility and is on a fantasy tour. It's great politics. **It's poor leadership**.”

Republicans see the sequester as the best way possible to actually reduce government spending, which they see as the biggest threat to the nation. They also are ready to note the spending cuts will affect their own offices, The Hill pointed out.

“The bigger concern is what is good for the country,” Rep. Bruce Lamborn, R-Colo., told The Hill. He will have to lay off one of his own staffers because of the sequester.

Republicans are also getting ready to battle by reminding voters it was the White House that came up with the sequester.

The cuts were meant to serve as an incentive for a supercommittee of lawmakers to produce a different deficit-reduction plan, Lamborn and other Republicans point out. But the supercommittee failed, and now sequester looks very likely.

It's doing exactly what it was designed to do: impose painful cuts on both defense and nondefense spending so that Republicans and Democrats would feel political pain.

“It was his [Obama’s] idea. We know that there are elections coming in 2014 — we know that the president and the party will be all out to reclaim the House — but we have acted in good faith, so the president can put all this on Republicans all he wants, but that's just not the fact,” Womack earlier told The Hill.

Conservative groups like the Club for Growth and the Heritage Foundation have urged lawmakers not to waiver from their stance, and predict political advantage from the cuts taking effect.

“If [Republicans] don't shy away from this, if they don't run from their own shadows and they don't [buckle] at the last minute, I think it's a battle they can win,” conservative Heritage Action spokesman Dan Holler said.

“The reason [Republicans] lose the battling war to the president so often is they can't get themselves on a clear path as to where they want to go. This is pretty easy, this is law,” he added.

“President **Obama opposes** any substantive **spending cuts while calling for new government programs and spending**, with ever higher taxes to pay for the excesses of his administration,” added Americans for Prosperity President Tim Phillips.

***\*\*\*GOP will fold on sequestration, PC’s not key, doesn’t affect immigration***

**Todd et. al 2/21** Chuck Todd, Mark Murray, Domenico Montanaro, and Brooke Brower, NBC News, 2/21/13, First Thoughts: GOP's weak position on the sequester, <http://firstread.nbcnews.com/_news/2013/02/21/17043492-first-thoughts-gops-weak-position-on-the-sequester?lite>, jj

\*\*\* **GOP’s weak position on the sequester**: Yesterday we asked this question about the political back-and-forth regarding the looming automatic budget cuts that are set to take place on March 1: What if the sky doesn’t fall? But here’s the opposite question: What if it does? And if that’s the case, **Republicans stand to pay the steepest political price**. **It’s not even close right now**. For starters, **look at the numbers from the first two national polls taken after the State of the Union**. The new USA Today/Pew poll: “President **Obama starts his second term with a clear upper hand over GOP leaders on issues from guns to immigration** that are likely to dominate the year**… On the legislation rated most urgent — cutting the budget deficit — even a majority of Republican voters endorse Obama's approach of seeking tax hikes as well as spending cuts**.” Also in this poll, **the president’s approval rating is at 51%, while the approval for congressional GOPers is at 25%**. And here’s Bloomberg’s poll: **“… Obama enters the latest budget showdown with Congress with his highest job- approval rating in three years** [55%] **and public support for his economic message, while his Republican opponents’ popularity stands at a record low** [35%].” So these are the numbers when the White House’s P.R. campaign to avert the sequester has only begun and before the expected layoffs and furloughs.

\*\*\* Where’s the compromise? Besides the polling numbers, **Republicans find themselves in a weak position -- politically -- because they’ve yet to propose ANY kind of compromise that recognizes they don’t control the White House or the U.S. Senate**. By contrast, **Obama has offered up entitlement cuts** (chained CPI for Social Security is apparently still on the table**), and he has indicated a willingness to make additional cuts to Medicare** (he said so in the State of the Union). **But Republicans are refusing to budge on any tax revenues** (via closing loopholes, etc.), even though House Speaker John Boehner offered them up during the fiscal-cliff debate. “House Republicans, shrugging off rising pressure from President Obama, are resolutely opposing new tax increases to head off $85 billion in across-the-board spending reductions, all but ensuring the cuts will go into force March 1 and probably remain in place for months, if not longer,” the New York Times says. Interestingly, Karl **Rove has proposed a sort of compromise for House Republicans to offer: “pass a continuing resolution next week to fund the government for the balance of the fiscal year at the lower level dictated by the sequester—with language granting the executive branch the flexibility to move funds from less vital activities to more important ones**.” In other words, force the Obama administration to choose which programs and entities get funded. Of course, this comes with political risk as many Republicans will fear that the Obama administration will essentially fund what he wants at the expense of programs or projects important to Republicans.

**A2: tax reform**

***No tax reform thumper***

Daniel **Gross**, **12/31**/12, Washington May Have a Deal on Taxes, but the Toughest Problems Remain, www.thedailybeast.com/articles/2012/12/31/washington-may-have-a-deal-on-taxes-but-the-toughest-problems-remain.html

Simply put, **there is no political climate or constituency for a grand bargain**. **The fault lies overwhelmingly** (although not entirely) **with Republicans**. A grand bargain would involve agreeing to raise tax revenues through boosting rates or loopholes while cutting entitlement and defense spending. But **Republicans** generally **don’t believe in raising tax revenues (they’re never willing to name the loopholes they’d close), don’t want to cut entitlements for those who now receive them, and don’t want to cut defense spendin**g. **Democrats** believe in raising tax revenues, but **don’t want to cut entitlement for current and future recipients, and are ambivalent about defense cuts. Do you see the political common ground for a deal there? Me neither.**

**A2: Gun Control**

***No momentum for gun control anymore --- immigration first***

NRA means the issue won’t even get brought up --- no fights

**Cramer & Kaczynski 2/20** Ruby Cramer, BuzzFeed Staff, Andrew Kaczynski, BuzzFeed Staff, BuzzFeed, Gun Control Forces Should Take A Page From Immigration Fight, Top Democrat Says, 2/20/13, <http://www.buzzfeed.com/rubycramer/gun-control-forces-should-take-a-page-from-immigration-fight>, jj

**House Minority Whip** Steny **Hoyer has** a blunt bit of **advice for gun control activists**: **get your people to the polls** to make lawmakers pay, **and one day you may be in the place where immigration reform advocates now find themselves.**

**"There is a great voting activism for immigration reform**," Hoyer said in an interview Tuesday afternoon at BuzzFeed's New York office. "**There's public awareness on gun violence, but whether there is an activism behind it like there is with immigration — there's not as broad and active support, which makes a difference."**

**What pushed immigration to the top of the legislative list for** President Barack **Obama and for Congress**, said Hoyer, **was the call for immediate action on the issue following last year's election, in which 71 percent of Latinos voted for the president over Republican candidate Mitt Romney.**

"Democracy works. Nor should we be cynical about that," said Hoyer, a veteran member from Maryland. "**When a large group of people want something and come to the polls and vote that way, politicians take notice. That's what democracy is all about."**

Hoyer added that with the kind of sweeping gun control legislation called for by President Obama — an ambitious package that would include a reinstated assault weapons ban, universal background checks on gun sales, and a 10-round limit on gun magazines — Congress would face the added difficulty of opposition from Second Amendment advocates like the National Rifle Association.

"**You have people who oppose immigration reform but they're nowhere near as focused and energized [and] politically [influential] as the NRA," he said.**

Of the measures proposed by President Obama, the magazine limit and background checks, said Hoyer, will fare the best in Congress. Asked if the assault weapons ban would have little chance of passing the Republican-controlled House of Representatives, Hoyer said, "I don't know that, but I assume it."

"The public will have an effect," Hoyer continued, adding that recent public opinion polling shows the vast majority of Americans — 91 percent according to a Quinnipiac poll this month — support universal background checks. "Assault weapons are less so in terms of public support," said Hoyer.

"I think [Senate Majority Leader **Harry] Reid is not that all sure an assault weapons ban could pass the Senate**," Hoyer said. "I think he does believe that magazines and background checks can."

**Link**

***Plan causes backlash—political support for increased fusion funding has evaporated***

**Broad, 9/29**

(NYT Columnist, “So Far Unfruitful, Fusion Project Faces a Frugal Congress,” http://www.nytimes.com/2012/09/30/science/fusion-project-faces-a-frugal-congress.html?\_r=2&pagewanted=all)

For more than 50 years, physicists have been eager to achieve controlled fusion, an elusive goal that could potentially offer a boundless and inexpensive source of energy. To do so, American scientists have built a giant laser, now the size of a football stadium, that takes target practice on specks of fuel smaller than peppercorns. The device has so far cost taxpayers more than $5 billion, making it one of the most expensive federally financed science projects ever. But so far, it has not worked. Unfortunately, the due date is Sunday, the last day of the fiscal year. And Congress, which would need to allocate more money to keep the project alive, is going to want some explanations. “We didn’t achieve the goal,” said Donald L. Cook, an official at the National Nuclear Security Administration who oversees the laser project. Rather than predicting when it might succeed, he added in an interview, “we’re going to settle into a serious investigation” of what caused the unforeseen snags. The failure could have broad repercussions not only for the big laser, which is based at the Lawrence Livermore National Laboratory in California, but also for federally financed science projects in general. On one hand, the laser’s defenders point out, hard science is by definition risky, and no serious progress is possible without occasional failures. On the other, federal science initiatives seldom disappoint on such a gargantuan scale, and the setback comes in an era of tough fiscal choices and skepticism about science among some lawmakers. The laser team will have to produce a report for Congress about what might have gone wrong and how to fix it if given more time.

***Dems and environmentalists hate it***

Leo **Hickman**, The Guardian, 8/23/**11**, Fusion power: is it getting any closer?, [www.guardian.co.uk/environment/2011/aug/23/fusion-power-is-it-getting-closer](http://www.guardian.co.uk/environment/2011/aug/23/fusion-power-is-it-getting-closer)

But ITER's projected costs are already rocketing, and politicians across Europe have expressed concern, demanding that budgets be capped. Fusion energy also has its environmental detractors. When the ITER project was announced in 2005, **Greenpeace said it "deplored" the project, arguing that the money could be better spent building** offshore **wind** turbines. "Advocates of fusion research predict that the first commercial fusion electricity might be delivered in 50-80 years from now," said Jan Vande Putte, Greenpeace International's nuclear campaigner. "But most likely, it will lead to a dead end, as the technical barriers to be overcome are enormous." Meanwhile, there is criticism from some plasma physicists that the design of ITER is wrong and alternative designs might produce better results for much less money.

***Plan’s unpopular – Congress sees fusion as a money vacuum***

**Rogers 12** – The Wisconsin Engineer is published by the Wisconsin Engineering Journal Association (Nathan, September, “Congress' Fusion Cutter,” http://wisconsinengineer.com/magazine/11/42/)

From what I learned, this seems to be a **reoccurring theme** in the field of fusion research here. The U.S. was once the leader in the field, but with constant cuts to funding we are quickly losing our title as ‘king of the hill.’ “You’ll hear the joke ‘fusion’s 40 years away; always has been, always will be’. What’s really been the problem is we said it was 40 years away when we looked at the funding level that was going on in the 60s and 70s when they were on track. But then you get **political figures** [that] aren’t seeing the progress that’s going to get recognition right away so they don’t maintain the funding level. This sets back fusion and sort of mothballs things and slows down the programs…” says Alexis Briesemeister, one of the graduate students working on HSX. It appears **history is repeating itself** as there has been a recent proposal to cut $50 million dollars from the fusion research budget. Not only that, but larger portions of the decreased budget have been promised to the International Thermonuclear Experimental Reactor (ITER) project being constructed in France. This combination has led to the need to shut down domestic research programs like the Alcator C-Mod over at MIT. Cuts like this have many concerned about the future of domestic fusion research. “Some of the best scientists end up leaving [the U.S.] because they can’t count on support” says Alexis. This is a real fear that many physicists are starting to face. I asked a few of the graduate students at HSX what their stance on the subject was. The reaction was unanimous; though none were overly eager to leave the U.S. for work abroad they would if the opportunities were not present here.

***Causes a fight over wasteful spending***

Geoff **Brumfiel**, Scientific American, June 20**12**, Fusion's Missing Pieces, EBSCO

Supporters argue that ITER is the only hope, in the long term, of meeting the world's unquenchable demand for power. But even they have been forced to recalibrate their Utopian expectations. The project now seems to be propelled by institutional inertia -- it is easier for individual governments to stay the course rather than be the lone pariah who pulls out early. Critics, meanwhile, have more ammunition with each delay and cost overrun. ITER, they say, is a colossal waste of money at a time when funding is desperately needed in other areas of energy research. Both sides agree: when the project is finally completed, it had better work.

# 2nr

**PC Key – General**

***Will pass, but ‘06 proves presidential leadership is key***

**Brownstein 2/4/13**, Ronald Brownstein, a two-time finalist for the Pulitzer Prize for his coverage of presidential campaigns, is National Journal Group's Editorial Director, in charge of long-term editorial strategy. He also writes a weekly column and regularly contributes other pieces for both National Journal and The Atlantic, and coordinates political coverage and activities across publications produced by Atlantic Media. Brownstein also writes for 2012 Decoded. Prior to joining Atlantic Media, Brownstein was the National Affairs Columnist for the Los Angeles Times. He has also served as the Times' National Political Correspondent and the author of the weekly Washington Outlook column. Brownstein is a National Journal alumnus, having served as the magazine's White House and National Politics Correspondent from 1983-1986, and then as its West Coast Correspondent through 1989. He appears regularly on national television, including NBC, ABC, CBS, and MSNBC, and served as a political analyst for CNN from 1998 through 2004. His sixth and most recent book, The Second Civil War: How Extreme Partisanship Has Paralyzed Washington and Polarized America, was published by Penguin in November 2007. Brownstein was twice named a finalist for the Pulitzer Prize, receiving that recognition for his coverage of both the 1996 and 2004 presidential campaigns. In addition, he is the recipient of several journalism awards, including the Exceptional Merit in Media award from the National Women's Political Caucus, the Excellence in Media award from the National Council on Public Polls in 2005, and the Journalist of the Year award from the Los Angeles Press Club in 2005. In 2007, the American Political Science Association presented him its Carey McWilliams award for lifetime achievement, granted to honor a major journalistic contribution to our understanding of politics. National Journal, Bush's Immigration Failure Offers Obama a Lesson, <http://www.nationaljournal.com/thenextamerica/immigration/bush-s-immigration-failure-offers-obama-a-lesson-20130204>, jj

**The prospects for major immigration reform are now the brightest in years, but for key players in Washington, a shadow still looms: the ghost of 2006.**

**That was the last time the stars were aligned for a breakthrough. Immigration reform that included a path to citizenship** for those in the United States illegally **had the support of** President **Bush, a broad labor-business-faith coalition, and a bipartisan Senate majority**. **Yet that armada ultimately splintered against the stony refusal of House Republican leaders to consider a bill opposed by a majority of their majority.**

Any of that sound familiar?

**Already many of the same dynamics are developing, with** President **Obama stamping immigration reform as a top priority, a bipartisan Senate coalition reassembling, a broad outside alliance of support groups coalescing—and most House Republicans rejecting anything that hints at “amnesty”** for illegal immigrants. **Yet the contrasts between now and 2006, particularly in the political climate**, are also significant. **Understanding both the similarities and the differences will be critical for reform advocates if they are to avoid replicating the disappointment they suffered under Bush.**

**Presidential interest was then, as it is now, critical in elevating immigration reform**. Since his days as Texas governor, Bush had courted Hispanics, and—even during the 2000 GOP presidential primary campaign—he strikingly defended illegal immigrants as “moms and dads” trying to make a better life for their children. Together with his political “architect,” Karl Rove, Bush saw comprehensive reform that coupled a path to citizenship with tougher enforcement as an opportunity to consolidate the beachhead that allowed him to capture more than 40 percent of Hispanic voters in his 2004 reelection.

**But Bush** largely **looked away** **when Republicans** **who controlled the House channeled that impulse in a very different direction**. In December 2005, they passed an enforcement-only bill drafted by Judiciary Committee Chairman Jim Sensenbrenner of Wisconsin, that, for the first time, designated all undocumented immigrants as felons. (Previously, illegal presence in the U.S. had been a civil, not criminal, violation.)

Initially, debate in the GOP-controlled Senate drifted. Majority Leader Bill Frist, considering a 2008 presidential bid, pushed his own enforcement-only bill. But amid the backdrop of huge public rallies against Sensenbrenner’s proposal, Sen. Arlen Specter unexpectedly joined with three other Republicans and all eight Judiciary Committee Democrats in late March to approve a comprehensive plan, including a path to citizenship, that followed a blueprint negotiated by Sens. Edward Kennedy and John McCain.

When broader Senate agreement teetered over the terms of legalization, Republican Sens. Chuck Hagel and Mel Martinez devised a compromise that divided illegal immigrants into three categories, requiring those here less than two years to leave but allowing those with deeper roots to eventually earn citizenship by paying fines and learning English. After **Bush finally delivered a national address on immigration, a bill embodying that plan cleared the Senate with 62 votes, including support from 23 Republicans.**

House Republicans immediately signaled their disinterest by refusing to appoint a conference committee and instead scheduled hearings in border communities to highlight security lapses. “Border security reigned supreme,” recalls Ron Bonjean, the communications director for then-Speaker Dennis Hastert. “I remember being in a meeting with … the leadership where pollsters came in and said border security was the key to our reelection.”

Even in 2006, something like the Senate plan likely could have attracted 218 votes in the House—but not a majority of Republicans. **Faced with a collision between his two political imperatives—courting Hispanics and mobilizing conservatives—Bush blinked, allowing House leaders to replace the Senate bill with enforcement-only legislation, which he signed that fall**. These choices began the GOP’s slide among Hispanics that continues unabated: Hispanic support for Republican House candidates plummeted from 44 percent in 2004 to just 29 percent in 2006, presaging Mitt Romney’s disastrous 27 percent showing among those voters in 2012.

That slippage is one of the two most important differences in the political environment around immigration between 2006 and today. Back then, as Bonjean notes, hardly any House Republicans argued that the GOP needed to pass a plan attractive to minorities. But many GOP leaders now see that as self-preservation. “The political imperative has shifted the tectonic plates,” says Frank Sharry, a key player in the 2006 debate who remains central as executive director of America’s Voice, which backs full citizenship for immigrants. “Immigration was viewed as a wedge issue for Republicans in 2006. Now it’s viewed as a wedge issue for Democrats.”

The “Gang of Eight” proposal released this week makes it likely that, **as in 2006, the Senate will eventually pass a bipartisan immigration bill**. **Once again, there are probably 218 House votes for such a plan, but not a majority of the majority Republicans**. That raises another key difference from 2006: Hastert faced little pressure to consider the Senate bill, because Bush bit his tongue when the speaker buried it. **If House Republicans shelve another bipartisan Senate plan in 2013, they should expect much more public heat, because Obama won’t be as deferential.**

***It’s at the top of the docket and PC is Key***

**Grant 1-25** (David, "Immigration reform: White House says promised push begins next week," Christian Science Monitor, [www.csmonitor.com/USA/Politics/2013/0125/Immigration-reform-White-House-says-promised-push-begins-next-week](http://www.csmonitor.com/USA/Politics/2013/0125/Immigration-reform-White-House-says-promised-push-begins-next-week))

President **Obama will begin his push for sweeping reform of the nation’s immigration laws** – a major campaign promise that was embraced by Latino voters in November – **on Tuesday** in Las Vegas, the White House announced on Friday.

The announcement that Mr. Obama would pursue legislation that, in the words of the White House, “must include a path to earned citizenship” for the more than 10 million undocumented immigrants in the country, came after a late morning meeting with congressional immigration reform advocates.

The president met with seven members of the Congressional Hispanic Caucus (CHC) – six House members and one senator, Bob Menendez (D) of New Jersey – to discuss strategy and policy for the coming immigration reform debate, according to broad details of the meeting provided by congressional aides and the White House.

**“The president is the quarterback and he will direct the team, call the play, and be pivotal if we succeed**,” said Rep. Luis Gutierrez (D) of Illinois, the House’s most seasoned immigration reform legislator.

“**I am very optimistic based on conversations with Republicans in the House and Senate that we will do more than just talk about the immigration issue this year**,” he added. Congressman Gutierrez was the leading Democratic House sponsor of the last drive for comprehensive immigration reform during the George W. Bush administration.