### a/t: Prolif

#### Nuclear is dead now switch to energy efficiency means squo solves their prolif advantage

**Lovins 10** \*Amory B. Lovins (&) is Chairman and Chief Scientist of Rocky Mountain Institute and Chairman Emeritus of Fiberforge Corporation, he advises governments and major firms worldwide on advanced energy and resource efficiency, In 2009, Time named him one of the 100 most influential people in the world, and Foreign Policy, one of the 100 top global thinkers [“Profitable Solutions to Climate, Oil, and Proliferation”, Amory B. Lovins, June 10th 2010, PDF]

The market-driven and politically popular shift to micropower also speeds global development by freeing up attention and capital for better buys. For example, producing efficient lamps and windows in developing counties takes nearly a thousand times less capital, and repays it about 10-fold faster, than expanding the supply of electricity to provide more lighting and comfort by inefficient methods.25 The resulting four-orders-of-magnitude reduction in the capital needed by the power sector—the most capitalintensive sector, gobbling roughly one-fourth of the world’s development capital—may be the strongest macroeconomic lever for global development, though one not yet recognized by the development and financial communities. A best-buys-first strategy would also improve global security by smoking out the proliferators of nuclear weapons.26 Taking economics seriously would mean no longer providing, let alone subsidizing, do-it-yourself bomb kits wrapped in innocent-looking civilian disguise. Removing those bomb kits from ordinary commerce would make their ingredients harder, more conspicuous, and politically costlier to get, and would make timely detection more likely because intelligence resources could focus on needles, not haystacks. Politically, the obligation to provide secure and affordable energy under Article IV of the Non- Proliferation Treaty could be satisfied better—in light of modern technical knowledge and market experience—by freely providing the technologies of ‘‘negawatts’’ and micropower (before China sells them to everyone) (Lovins 2010c). This is precisely the demand of developing countries expressed in Copenhagen: financial help to get off fossil fuels and protect the climate. Incidental but important benefits of these more granular technologies would be to reduce procurement corruption, increase transparency, advance the role and education of women, strengthen the social periphery vis-a`-vis the center, and slow or reverse rural-to-urban migration.

### a/t: Grid

#### Overwhelmingly solves the grid

**Cowart and Raynolds 2000** – \*JD and MCP degrees from UC Berkeley, where he was editor-in-chief of the Ecology Law Quarterly, Principal and European Programmes Director for The Regulatory Assistance Project, \*\*Alliance to Save Energy (Richard and Ned, Alliance to Save Energy, Electricity Reliability White Paper, “The Contribution of Energy Efficiency to the Reliability of the U.S. Electric System”, http://ase.org/resources/electricity-reliability-white-paper, WEA)

Energy Efficiency Cost-Effectively Saves Energy and Reduces Peak Demand

As described earlier, utility sponsored DSM programs came about because state regulators realized and energy efficiency advocates demonstrated that saving energy could be less expensive than producing it (Lovins 1976, SERI 1981). Although the performance of utilities varied widely in the cost-effectiveness of their design and administration of energy efficiency programs, several rigorous studies showed that overall, they were cost-effective. EIA analysis of utility reported 1994 data on DSM programs showed that the mean utility cost for energy efficiency programs fell to 2.9 cents per kWh saved, and a number of utilities were able to achieve substantial energy savings at costs below 2 cents per kWh saved (EIA 1994). Although some analysts cast doubt on these figures, arguing that variances in utility accounting, measurement, and reporting practices can vary widely and that in some cases, customer costs were not included in reported program costs, a thorough examination of 40 of the largest U.S. utility commercial-sector DSM programs verified the initial findings of cost-effectiveness (Eto, Kito, Shown, and Sonnenblick 1995). This study accounted for all customer costs and all overhead and administrative expenses, including financial incentives paid to utilities as well as the cost of measuring savings. It also examined the savings evaluation methods used by utilities and found that the choice of method did not introduce a statistically significant bias in the results. On average, DSM programs were found to have saved energy at a cost of 3.2 cents per kWh and that, on average, they were highly cost effective when compared to the original avoided costs used by utilities when designing the programs. The range of program costs and the energy saved by those programs are illustrated by Figure 3 on the next page.

Moreover, evaluation of energy efficiency program costs on the basis of the average cost-per kWh of energy saved can dramatically understate the value of the peak demand reductions delivered by those programs. Demand reductions avoid the monetary (and environmental) costs of generation on the margin. An individual customer that reduces demand receives the private benefit of reduced energy bills, but since the market-clearing price for delivered energy at any time is a function of overall system demand, individual load reductions reduce this price, providing monetary benefits to all (Ferguson 1999). A situation that occurred in the Pennsylvania-New Jersey-Maryland (PJM) power pool on July 6, 1999 illustrates this phenomena very well. PJM’s load that day reached an all-time high, and as a consequence, it deployed its active load management program to reduce demand during the mid-day hours. The program cut demand by an average of 1% during nine peak-load hours. Because electricity prices reached $920/MWh during these hours, this demand reduction cut electricity costs by $10 million. (Were it not for these demand reductions, electricity prices would have been even higher!) This $920/MWh price was 20 times higher than the average price in PJM between June and September, 1999 (Hirst 2000).

Figure 3. The Cost of the Largest Utility Commercial Sector DSM Programs 1992

By "Lightening the Load" Energy Efficiency Has Enhanced Reliability

Energy efficiency, by reducing demand, unquestionably contributes to system reliability, primarily in terms of supply adequacy. Quite simply, energy efficiency measures implemented within a particular service area or region can reduce both the base load, the amount of energy required to be supplied to that area or region, as well as the peak power demand. The contribution of energy efficiency measures to reducing base or peak load depends on the technologies targeted: lighting and refrigeration efficiency, for example, would reduce base load, while air conditioner efficiency gains would help reduce summertime peak load. (Of course, any reduction in base load reduces the "height" of the peak load.) Thus, energy efficiency measures in the aggregate help to maintain adequate margins of generation supply adequacy.

However, efficiency can also contribute to the security aspect of reliability, at the level of local transmission and distribution networks. The well-publicized outages of the summer of 1999 in both New York and Chicago were caused by failures and weaknesses in the distribution system, not generation supply inadequacy. The thermal failures in distribution transformers and feeder cables were the result of high, sustained peak demand, demand that could have been mitigated by more aggressive end-use efficiency programs in those areas. Thus, to the degree that energy efficiency reduces the load and stress induced on various points in the power distribution network, it also can enhance the security of the system by decreasing the likelihood of failures at those points in the system.

#### Efficiency solves grid reliability—top experts agree

**Siemens 2012** (4/17, Sustainable Cities News, “Smart grid technologies supporting energy efficiency, electric grid reliability”, http://www.usa.siemens.com/en/news\_events/sustainable\_cities\_article.php?id=800755050, WEA)

An important U.S. official is continuing to support the adoption of energy efficiency technologies in the nation's electric grid. Jon Wellinghoff, the chairman of the Federal Energy Regulatory Commission (FERC), is one of only a handful of officials tasked with overseeing the nation's sweeping power supply network. FERC often serves as a deciding voice on issues pertaining to the U.S. electric grid, and Wellinghoff has increasingly supported demand response initiatives as a means of improving overall functionality and reliability. Under such an energy efficiency scheme, companies forge agreements with utility ratepayers. Large companies often participate in demand response systems, agreeing to curtail their energy usage during periods of peak demand. Typically, energy demand spikes during the summer months, with residential electricity consumption levels surging in the late afternoon to early evening.<br /><br /> "Utilities are going to have to change or die. Traditionally, their business model has been vertically integrated; they generate, distribute, and sell energy. Now, you're seeing opportunities for utility customers – commercial building owners, the Walmarts and Safeways of the world – to fully participate in energy markets and go head to head with utilities," Wellinghoff told Tech Review.<br /><br /> "Ultimately, you'll have companies helping homeowners install technologies to facilitate their participation. Because of this competition, utilities will have to determine how they are going to continue to make a profit," he added.<br /><br /> As it stands, the nation's electric grid is a largely antiquated system that was constructed decades ago. As a result, power supply disruptions are rather common, and utilities are often limited in their ability to both prevent and patch such outages. According to Wellinghoff, as more consumers and businesses work to improve <a href="http://www.technologyreview.com/business/40020/?p1=BI">energy efficiency</a>, such reliability issues will become less common.<br /><br /> Moreover, Wellinghoff said that the continued adoption and implementation of such smart grid and energy efficiency systems would ultimately help solve more significant energy problems.<br /><br /> "It can get us a long way. Utility commissioners in Massachusetts recently told me they are looking at potentially zero energy-load growth, because they're using smart meters and other devices and have very aggressive energy efficiency programs," Wellinghoff told MIT's Technology Review. "I think we're seeing a dramatic shift in the whole energy dynamic in the country. In the next five to 10 years, we'll have the ability to manage our energy so that we need very few new traditional resources."<br /><br />

#### Solves grid reliability

**Levine and Kendall**, Senior Attorney Conservation Law Foundation and Ralph C. Menapace Fellow in Environmental and Land Use Law, **2006** [Sandra and Katie Energy Efficiency and Conservation: Opportunities, Obstacles, and Experiences LexisNexis fall 2006 Fu]

There are many benefits to meeting our power needs with less energy. Some are obvious. Using less power avoids the cost and pollution of new power plants. [n2](http://www.lexisnexis.com/us/lnacademic/frame.do?tokenKey=rsh-20.124355.55614413241&target=results_DocumentContent&reloadEntirePage=true&rand=1216060926842&returnToKey=20_T4157208328&parent=docview#n2) It also lowers overall energy costs and improves system reliability. [n3](http://www.lexisnexis.com/us/lnacademic/frame.do?tokenKey=rsh-20.124355.55614413241&target=results_DocumentContent&reloadEntirePage=true&rand=1216060926842&returnToKey=20_T4157208328&parent=docview#n3) Investing in energy efficiency results in achieving energy needs for about one-third to one-half the cost of buying more power on the open market. [n4](http://www.lexisnexis.com/us/lnacademic/frame.do?tokenKey=rsh-20.124355.55614413241&target=results_DocumentContent&reloadEntirePage=true&rand=1216060926842&returnToKey=20_T4157208328&parent=docview#n4) **More efficiency also reduces load, wear, and maintenance needs on the entire electrical system, allowing improved reliability of our** power **grid**. [n5](http://www.lexisnexis.com/us/lnacademic/frame.do?tokenKey=rsh-20.124355.55614413241&target=results_DocumentContent&reloadEntirePage=true&rand=1216060926842&returnToKey=20_T4157208328&parent=docview#n5)

The benefits from energy efficiency and conservation also extend beyond benefits to those who reduce consumption and have lower energy bills. Improving efficiency lowers overall demand on the system and can thereby lower the wholesale market clearing price for electricity because less energy is needed. [n6](http://www.lexisnexis.com/us/lnacademic/frame.do?tokenKey=rsh-20.124355.55614413241&target=results_DocumentContent&reloadEntirePage=true&rand=1216060926842&returnToKey=20_T4157208328&parent=docview#n6) A lower clearing price allows lower electric prices for all customers. [n7](http://www.lexisnexis.com/us/lnacademic/frame.do?tokenKey=rsh-20.124355.55614413241&target=results_DocumentContent&reloadEntirePage=true&rand=1216060926842&returnToKey=20_T4157208328&parent=docview#n7) This is particularly important in places like Vermont where the long-term contracts for two-thirds of the State's energy supply, from Hydro Quebec and Vermont Yankee, will expire in the next decade, and will most likely be replaced with more expensive power from the wholesale market. [n8](http://www.lexisnexis.com/us/lnacademic/frame.do?tokenKey=rsh-20.124355.55614413241&target=results_DocumentContent&reloadEntirePage=true&rand=1216060926842&returnToKey=20_T4157208328&parent=docview#n8)

### a/t: Nuclear Energy Now

#### 1). All of our evidence is future predictive and says that funding for new reactors will tradeoff with current resources

#### 2). No market for new reactors now

**Lovins 10** \*Amory B. Lovins (&) is Chairman and Chief Scientist of Rocky Mountain Institute and Chairman Emeritus of Fiberforge Corporation, he advises governments and major firms worldwide on advanced energy and resource efficiency, In 2009, Time named him one of the 100 most influential people in the world, and Foreign Policy, one of the 100 top global thinkers [“Profitable Solutions to Climate, Oil, and Proliferation, Amory B. Lovins, June 10th 2010, PDF]

This shift toward no- and low-carbon sources of electricity speeds climate protection. Not all such sources are equally effective: a new nuclear plant does save carbon, but \*2–20 times less and \*20–40 times slower than buying micropower instead, so nuclear investment would reduce and retard climate protection (Lovins et al. 2008). Few governments understand this opportunity cost, so some now favor nuclear revival. However, they are finding the private capital markets unwilling to finance new nuclear build,23 so its financing and risk must generally fall on taxpayers—an approach ranging from politically unattractive to illegal (in the EU)—or on captive customers.24

#### No renaissance now

**Rose, 11** [Michael, Michael Rose has directed, written, and or produced over two hundred television programs that have aired around the world. His most recent film, Elvis: Return to Tupelo, premiered last Fall on the bio channel and will be shown on PBS starting this Spring. March 15th, Too Cheap to Meter: The Top 10 Myths of Nuclear Power, <http://www.huffingtonpost.com/michael-rose/too-cheap-to-meter-the-to_b_835730.html>]

Myth #4: The U.S. is in the midst of a nuclear renaissance. We've had a nuclear bubble but "when builders came to realize the costs it started to dissolve," said Bradford. The myth of the nuclear renaissance has been an effective public relations ploy of the nuclear industry but we've seen the operators at the Calvert Cliffs, Maryland reactor pull out and the backers behind a proposed reactor in Houston, Texas have also pulled out. Things are sputtering. "If this is what the original renaissance looked like then we never would have had Michelangelo or Leonardo da Vinci," said Hirsch.

No nuclear power expansion now – claims of a renaissance are overblown

**Becker, 7/23/12** [Becker is chairman of the Koeberg Alert Alliance, “PETER BECKER: Nuclear industry ‘rebirth’ is instead stillborn”, <http://www.businessday.co.za/articles/Content.aspx?id=176811>]

THE nuclear power industry is deeply troubled, with little cause for optimism. There is growing worldwide public resistance to nuclear power stations, US President Barack Obama has terminated government subsidies for nuclear power, and Germany and Switzerland have committed to shutting down all their reactors. While the renewable energy industry has seen dramatic growth and constantly falling costs, the nuclear industry grapples with spiralling costs, the seemingly intractable waste-disposal issue, and the huge economic and human costs of the Fukushima nuclear disaster in Japan. We have heard from the nuclear lobby that a "nuclear renaissance" is just around the corner and, as evidence of this, we are told 65 reactors are "under construction" worldwide. Examination of this list reveals some interesting details. The International Atomic Energy Association maintains a database of all commercial reactors, the Power Reactor Information System (PRIS). In March this year, it listed 65 reactors as "under construction". It is instructive to look at the number of years some of these have been "under construction". For example, Lungmen 1 and 2 in China were begun in 1997 and have so far taken 15 years to build. In the Slovak Republic, construction of Mochovce 3 and 4 was started in 1987, making 25 years so far. For Atucha 2 in Argentina, it’s 31 years. Moving from the disappointing to the ludicrous, Watts Bar 2 in the US has been "under construction" since 1972. It is likely these long-delayed projects will eventually be cancelled, and almost certainly they will never be an economic success. Even if they are ever completed, the designs will be frighteningly outdated and their safety features unlikely to satisfy current regulatory requirements or public concerns. It is therefore disingenuous to include these in a list of "success stories" about nuclear power. Eliminating the reactors that have been "under construction" for 15 years or more reduces the list of 65 to 52. Another item in the PRIS data is the estimated start-up year. It is interesting that for many of these reactors across South Korea, India, France, Brazil and China, the PRIS database does not list an estimated start-up year. It is unusual, to say the least, for a construction project to have no estimated completion date. This can be interpreted as either a lack of commitment to the project or a sign that problems have arisen that will delay construction. These can hardly be considered success stories and eliminating them from the list of 52 reactors leaves just 10 reactors. Of these 10, most are in pairs and they are spread over six different nuclear plants. And of these plants, only two (Vogtle in the US and Flamville in France) are in the West. What is more, Vogtle is likely to be the last nuclear plant built in the US and was viable only because of subsidies from the Bush administration. Another statistic offered by the World Nuclear Association is that nuclear power is being "considered" by 45 countries that do not currently use it. At first glance, this seems to be impressive evidence of the nuclear "renaissance". However, any country that is considering using nuclear power is, by definition of the word "considering", also considering not using it. An analysis of the 45 countries reveals interesting examples. It includes Namibia and Mongolia, which both consume about 3000GWh a year. A small nuclear power station such as Koeberg, if operated at 80% capacity, would produce more than 12000 GWh a year. Is it likely any country will pay for generating capacity that will produce more than four times the electricity they need? Including these countries in the "considering" list is a distortion of the facts by the World Nuclear Association, perhaps born of a desperation to conceal the decline of the industry. Nuclear power plants are very long-term commitments. It is therefore important to have a healthy global nuclear industry in place so that services such as maintenance, spare parts, decontamination after a leak, plant decommissioning and waste handling are available at reasonable prices when they are required, decades from now. The sad truth is that even according to the optimistic International Atomic Energy Agency data from the PRIS data, the number of reactors on which construction was started fell 75% from 2010 to last year, and again 75% from last year to this year. Far from a renaissance, this is a catastrophic collapse. SA would do well to wait a few years to see if this trend reverses before locking itself into the nuclear energy option.

### 2NC Efficiency Link Run

#### The plan destroys efficiency tech:

#### a.) Funding – investment in nuclear energy takes funding away from energy efficiency measures that are comparatively more beneficial – limited resources means that the two are an opportunity cost to one another

#### b.) Focus – nuclear tech distracts policymakers and creates the false belief that they don’t need to take other measures

#### c.) Private Investment – the plan diverts the private sector’s desire to invest in efficiency

**Roche\* 7 – \***Site editor, no direct author given, but N02 Nuclear Power.org is a site created and run by Pete Roche who is an energy consultant based in Edinburgh and policy adviser to the Scottish Nuclear Free Local Authorities, and the National Steering Committee of [UK NFLA](http://nfznsc.gn.apc.org/). Pete was co-founder of the Scottish Campaign to Resist the Atomic Menace (SCRAM), he has represented Greenpeace at international meetings and is active in several other areas relating to environmental protection and nuclear power [http://www.no2nuclearpower.org.uk/reports/Opportunity\_Costs\_Nuclear.pdf, January 2007 “Opportunity Costs of Nuclear Power]

So it is important that our capacity to implement other carbon abatement measures is not damaged by a decision to go ahead with the construction of new reactors. Warwick Business School (UK) (WBS) argues that, far from complementing the necessary shift to a low carbon economy, the scale of the financial and institutional arrangements needed for new nuclear stations means they would fatally undermine the implementation of low carbon technologies and measures such as demand management, and therefore will ultimately undermine the shift to a true low carbon economy. (12) The SDC says a new nuclear programme would give out the wrong signal to consumers and businesses, implying that a major technological fix is all that’s required, weakening the urgent action needed on energy efficiency. The Commission says a decision to proceed with a new reactor programme will require “a substantial slice of political leadership … political attention would shift, and in all likelihood undermine efforts to pursue a strategy based on energy efficiency, renewables and more CHP.” (13) Sir Jonathon Porritt, chair of the Commission, says nuclear power is seriously diverting attention from the hard decisions required to solve the UK's energy challenges. (14) There needs to be sufficient development of renewable energy and energy efficiency to start switching the 97.5% of world energy consumption to a low carbon system. At best a decision to promote new reactors might replace existing nuclear capacity, but have no impact on how the other 97.5% of energy consumption is supplied. At worst the decision might not even result in existing stations being replaced because of construction delays or public opposition, but the development of a low carbon energy system is stalled, because resources have been drained from the alternatives, as the Environment Agency (of England and Wales) warns could happen. (15)

#### Empirics vote neg

**Roche\* 7 – \***Site editor, no direct author given, but N02 Nuclear Power.org is a site created and run by Pete Roche who is an energy consultant based in Edinburgh and policy adviser to the Scottish Nuclear Free Local Authorities, and the National Steering Committee of [UK NFLA](http://nfznsc.gn.apc.org/). Pete was co-founder of the Scottish Campaign to Resist the Atomic Menace (SCRAM), he has represented Greenpeace at international meetings and is active in several other areas relating to environmental protection and nuclear power [http://www.no2nuclearpower.org.uk/reports/Opportunity\_Costs\_Nuclear.pdf, January 2007 “Opportunity Costs of Nuclear Power]

The Finnish experience Very soon after the Finnish Parliament voted in 2002 to build a new reactor, Olkiluoto 3, many people – industry and trade union leaders - who had argued that because of Finland’s Kyoto commitments a new nuclear power station was necessary, started to say that the Kyoto agreement was a big mistake, unfair to Finland, and far too costly. After falling in 2001 and 2002, Finland’s carbon emissions are now rising. Measures promised in the climate report of 2001 have not been implemented, for example, energy taxation. The tone in Finland is now that Kyoto is in practice, impossible. (16) According to Finland's former environment minister, Satu Hassi MEP, once the decision was made, the country lost interest in alternative energy sources. (17) Under the Kyoto Protocol, Finland has agreed to keep its greenhouse gas emissions at 1990 levels during the 2008-2012 target period. Emissions were around 9% above 1990 levels in 2002. Measures will have to be implemented to address this issue given that business-as-usual projections by the government indicate further increases in greenhouse gases, reaching 15% above 1990 levels during the first target window. The International Energy Agency highlights the risk to Finland of relying on carbon dioxide reductions coming from the operation of the new reactor. It says this may inhibit Finland’s ability to meet its greenhouse gas reduction targets under Kyoto, if the operation of the plant is in any way delayed. (18) In fact construction of Olkiluoto 3 has now fallen eighteen months behind schedule. (19) It’s original target date for completion was 2009, so there is a danger that it will not be available in time to contribute to meeting Finland’s target.

#### decentralized energy link

**Transition to a decentralized power system now- new reactors entrench the centralized system which is a massive cause of warming independent of nuclear’s carbon reductions**

**N02NP.org 7 \***N02 Nuclear Power.org is a site created and run by Pete Roche who is an energy consultant based in Edinburgh and policy adviser to the Scottish Nuclear Free Local Authorities, and the National Steering Committee of [UK NFLA](http://nfznsc.gn.apc.org/). Pete was co-founder of the Scottish Campaign to Resist the Atomic Menace (SCRAM), he has represented Greenpeace at international meetings and is active in several other areas relating to environmental protection and nuclear power [http://www.no2nuclearpower.org.uk/reports/Opportunity\_Costs\_Nuclear.pdf, January 2007 “Opportunity Costs of Nuclear Power]

Centralised vs decentralised energy The developed world is currently dominated by centralised electricity generating systems, which are the embodiment of technological inertia, performing little better today than in the 1970s. This centralised system is hugely wasteful and environmentally damaging. Technological advances over the past 30 years suggest an optimum model of electricity supply and distribution, which is entirely different. Around two thirds of the energy in the fuels used is thrown away as waste heat, and in the electricity transmission wires. So 65% of the energy is lost before it even reaches consumers. If we could make use of this waste heat it would make a very large contribution to tackling climate change and improving security of supply. Within the 25 (pre-2007) European Union nations, for example, the electricity sector is responsible for releasing more than 1.2 billion tonnes of carbon dioxide (CO2) and over 2600 tonnes of dangerous radioactive waste every year. At the same time more than half of Europe’s power plants are more than 20 years old, and will need to be replaced over the next decade or so, offering an opportunity to move towards a more sustainable system which protects the climate and provides future generations with secure energy. (20) Nuclear power stations are the epitome of centralised generation. In contrast, renewable generation and combined heat and power stations lend themselves towards a more decentralised system and a greater use of demand management. Projects tend to be smaller and sited closer to the point of demand, with greater flexibility. Customer involvement - a key aspect to behavioural change is easier to achieve. The question for policy makers is whether support for nuclear power, which will bolster the centralised model of electricity distribution, will also damage efforts to shift to a more sustainable, low carbon, model which maximizes use of renewables and demand management. Warwick Business School concludes that support for new reactors is more likely to strengthen the momentum of the conventional energy system than enable a decentralised energy system to develop. This is because it would: • Reduce the pressure for appropriate network infrastructure development; • Reduce the pressure for policy measures to ensure the removal of barriers within economic regulation for small-scale technologies; • Reduce the pressure for policy measures to ensure greater links within an energy system between supply and demand reduction, for example a move to a service culture or a push for metering reform, and • Reduce the pressure for behavioural change. If governments are serious about wishing to combat climate change and moving towards a low carbon energy system, then they must choose between a centralised energy system and a decentralised one. A low carbon energy system would be a decentralised energy system. Governments need to implement policies which all work in the same direction, and ensure that the broader political and institutional support, socio-cultural attitudes and trends are all in line. Cherry picking, say nuclear power, from a centralised system and trying to get it to work in concert with a decentralised sustainable system will not work. A portfolio of least-cost investments in efficiency and decentralized generation will be cheaper, than nuclear power and faster to implement. According to Lovins, this isn’t hypothetical; it’s what today’s marketplace is proving decisively. Nuclear power has already died of an incurable attack of market forces, with no credible prospect of revival. Current efforts to deny this reality will only waste money, further distort markets, and reduce and retard carbon dioxide displacement. Cheaper, faster, abundant decentralized alternatives are now being bought an order of magnitude faster, and offer far greater ultimate potential. (21) Investing in new nuclear power stations would have a huge opportunity cost – the opportunity to kick-start a new approach to energy, in which every building and community contributes to generating the power they need. The closure of nuclear, as well as fossil fuel plant across the world over the next twenty years provides us all with an exciting opportunity to develop a decentralised low-carbon energy system more compatible with the needs of the post Kyoto world. (22)

### 2NC Uniqueness Run

#### Energy efficiency is coming now but more is needed

**Bendewald 11** \*Master of Science in Civil Engineering, Building Systems Program, University of Colorado at Boulder, Michael Bendewald is a Consultant on RMI’s Buildings Team [http://blog.rmi.org/Pushing\_Energy\_efficient\_Retrofits\_Closer\_Tipping\_Point\_blog, Pushing Energy-efficient Retrofits Closer to the Tipping Point December 22nd 2011]

It is not often these days that a public initiative, mired as many governments are in partisan and fiscal gridlock, holds promise to create a positive tipping point. President Obama’s call for $4 billion worth of deep retrofit work resulting in energy-efficient buildings, half in the private sector, could be such a step. This commitment, which will be paid for by energy savings at no cost to the federal government, will accelerate growth of the energy retrofit industry with better processes and skill sets, making building retrofits more cost effective. And, the benefits of making buildings more energy efficient extend far beyond the energy cost savings. Buildings use 42 percent of the nation’s energy—much of which is wasted. By aggressively adopting efficiency solutions, we can transform our buildings from energy hogs to more comfortable, liveable and workable spaces that can help usher in an efficient and [renewable energy era](http://rmi.org/rmi/ReinventingFireInfographic). Admittedly, the task is daunting. America’s 120 million buildings are staggeringly diverse, and upgrades can be done only one building at a time. Huge barriers stand in the way, from regulatory rules that penalize utilities for making buildings more efficient to an overall lack of awareness of the many benefits of energy efficiency among building owners and occupants. But we’re not starting from scratch. There’s already good headway in making existing buildings more efficient in both the public and private sectors, with clear and measurable benefits to our economy and job creation. Proving the economic case and creating jobs: Empire State Building The hugely successful [Empire State Building](http://www.retrofitdepot.org/casestudies/TrueStories/CaseStudy-EmpireStateBuilding#tabs) retrofit—a joint effort between the Clinton Global Initiative, Jones Lang LaSalle, Johnson Controls and Rocky Mountain Institute—led to $4.4 million in annual savings and a three-year payback. This project not only serves as an example of the economics of efficiency, it shows how retrofit projects can create jobs (Newsweek breaks down the [252 jobs created by the project](http://esbnyc.com/sustainability_energy_efficiency.asp)) and attract and retain building tenants. Stimulating the Economy through Government Buildings: Byron Rogers A retrofit of the [Byron Rogers Federal Building](http://retrofitdepot.org/BROverview) in Denver is expected to make the building one of the most energy-efficient office buildings in the nation—resulting in a projected 61 percent reduction from existing energy use from efficiency alone. To ensure that successes from this project could be replicated in future retrofits, RMI recently advised the U.S. General Services Administration on a [Net Zero Renovation Challenge](http://blog.rmi.org/Five+Ways+Federal+Buildings+Can+Get+to+Net+Zero+Energy). The challenge will help energy service companies develop skill sets for energy retrofits that lead to deeper cost savings. Demonstrating these skills will allow them to change their business models and create a competitive advantage. Reaching the Tipping Point These projects are by no means outliers. Commercially valued rating systems such as LEED (total square feet of existing LEED-certified building space exceeded the square feet of LEED new construction this month) and ENERGY STAR—which helped deliver net energy savings of $17 billion in 2009 alone—continue to gain momentum, and grow the market for efficiency technologies and services. Also, a [new report](http://newbuildings.org/sites/default/files/NEEA_Meta_Report_Deep_Savings_NBI_Final8152011.pdf) from Better Bricks and New Buildings Institute demonstrates retrofits can achieve far beyond the 20 percent energy savings by 2020 sought by Obama’s initiative. This report analyzes 50 recent [deep energy retrofits](http://retrofitdepot.org/Deep-Retrofits) that achieved 30–80 percent energy cost savings. In each case, integrative design was more critical to project success than any particular technology. Now, the challenge is to dramatically accelerate these nascent trends, and take deep retrofits to scale. That will take both a leap in awareness of the potential for efficiency gains and leadership from energy service companies, building owners, regulators, politicians and consumers. These players might be motivated for many reasons, ranging from dollar savings and job creation to energy security and public health. I was recently reminded, in an e-mail conversation with my college philosophy professor, that accomplishing the important results of this work transcends personal ideology or motivation. Our discussion was about RMI’s new book, [Reinventing Fire](http://rmi.org/reinventingfire), which maps pathways for running a 158 percent-bigger U.S. economy in 2050 with no oil, no coal, and no nuclear energy. My friend liked our vision, but expressed qualms about our focus on America being first in the clean energy race. In the end, we agreed that finding ways to motivate powerful potential drivers of change, such as business leaders, was key to achieving the bigger vision. “Sometimes accomplishing something may be more important than whether it fits my ideological framework,” my professor said. Retrofits are a key part of that progress. The techniques, partly with Rocky Mountain Institute’s help, are being refined. If Obama’s initiative helps them become widespread, we will have made strides toward enabling the needed energy infrastructure of the 21st century.

#### Executive order and economic factors will cause investment in efficiency now-solves any barriers

**Aden and Bradbury 9/6 –** \*James Bradbury is a Senior Associate in WRI’s Climate and Energy Program, conducting research and analysis on U.S. federal and state climate and clean energy policies, Nate Aden is a Research Fellow with WRI’s Climate and Energy Program [http://www.greenbiz.com/blog/2012/09/06/white-house-energy-efficiency-plan-boost-manufacturing, White House energy efficiency plan will up output, curb emissions

Last week, President Obama [signed an Executive Order](http://www.whitehouse.gov/the-press-office/2012/08/30/executive-order-accelerating-investment-industrial-energy-efficiency) establishing a national goal of deploying 40 gigawatts (GW) of new industrial [combined heat and power](http://www.greenbiz.com/blog/2012/01/10/combined-heat-power-finally-ready-prime-time) (CHP) and waste heat recovery (WHR) by the end of 2020, a 56 percent increase from 2010 levels. The actions outlined by the order will help spur investment in U.S. industrial energy efficiency, [which will](http://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_report_12-08.pdf) reduce greenhouse gas emissions, create jobs, and strengthen manufacturing competitiveness by decreasing energy bills. A Substantial Target This executive order reinforces domestic energy market and regulatory developments that are converging to make [conditions for CHP investments](http://insights.wri.org/news/2012/02/new-snapshot-energy-use-midwest-manufacturing) more favorable than they have been for decades. Key contributing factors include federal environmental regulations and rapidly [changing energy economics](http://www.wri.org/publication/us-electricity-markets-increasingly-favor-alternatives-to-coal), particularly regarding U.S. shale gas development. As a result of converging resource, economic, and regulatory circumstances, U.S. base-load power generation capacity is projected to drop just as manufacturing facilities with older boilers are considering compliance options for reducing toxic air emissions. Under the right policy conditions, this confluence of factors can facilitate deployment of natural gas-fired industrial CHP/WHR. The Oak Ridge National Laboratory [estimated](http://info.ornl.gov/sites/publications/files/Pub13655.pdf) in 2008 that CHP amounted to 8.6 percent of U.S. electricity generation capacity and 12.6 percent of electricity generation, compared to Denmark’s CHP utilization of more than 50 percent of electricity generation. Reports [estimate](http://www.uschpa.org/files/public/USCHPA%20WADE_ITC_Report_FINAL%20v4.pdf) that the U.S. has approximately 64 GW of remaining industrial CHP technical potential. Within the U.S., the Midwest has [particularly large opportunities](http://www.wri.org/publication/midwest-manufacturing-snapshot) for increased CHP utilization. While there is large potential, the ambition of President Obama’s 40 GW goal is illustrated by its juxtaposition with the current [Department of Energy Annual Energy Outlook 2012](http://www.eia.gov/forecasts/aeo/) reference case forecast for industrial CHP. As illustrated below, the new CHP goal is 13 percent higher than the reference case forecast for 2020 installed capacity. Achievement of the 2020 CHP goal would result in 56 percent growth of U.S. industry CHP capacity compared to 2010 levels. How Will the Executive Order Help Move Industrial Energy Efficiency Forward? The Executive Order aims to help address persistent regulatory, policy, and institutional barriers that have long-prevented proven efficiency technologies from being more fully utilized in the United States. While recent conditions have become more favorable, key barriers to investment have included unfavorable market prices for energy, electricity sector rate structures that discourage utilities from supporting end-use efficiency and self-generation, and high up-front costs that may be viewed as risky to manufacturers concerned about future economic conditions. It also facilitates increased industrial energy efficiency investment through interagency coordination and convening of national and regional stakeholders. Industrial companies, policy makers, and regulators are encouraged to identify, develop, and implement state best practice policies, as well as technical assistance programs and public education programs. For example, the U.S. Department of Energy has established eight regional [Clean Energy Application Centers](http://www1.eere.energy.gov/manufacturing/distributedenergy/ceacs.html) that provide information, education, and technical assistance in the application of CHP.

# warming

**Left unchecked, warming will cause extinction**

**Sify 2010** – Sydney newspaper citing Ove Hoegh-Guldberg, professor at University of Queensland and Director of the Global Change Institute, and John Bruno, associate professor of Marine Science at UNC (Sify News, “Could unbridled climate changes lead to human extinction?”, <http://www.sify.com/news/could-unbridled-climate-changes-lead-to-human-extinction-news-international-kgtrOhdaahc.html>, WEA)

The findings of the comprehensive report: 'The impact of climate change on the world's marine ecosystems' emerged from a synthesis of recent research on the world's oceans, carried out by two of the world's leading marine scientists.

One of the authors of the report is Ove Hoegh-Guldberg, professor at The University of Queensland and the director of its Global Change Institute (GCI).

'We may see sudden, unexpected changes that have serious ramifications for the overall well-being of humans, including the capacity of the planet to support people. This is further evidence that we are well on the way to the next great extinction event,' says Hoegh-Guldberg.

'The findings have enormous implications for mankind, particularly if the trend continues. The earth's ocean, which produces half of the oxygen we breathe and absorbs 30 per cent of human-generated carbon dioxide, is equivalent to its heart and lungs. This study shows worrying signs of ill-health. It's as if the earth has been smoking two packs of cigarettes a day!,' he added.

'We are entering a period in which the ocean services upon which humanity depends are undergoing massive change and in some cases beginning to fail', he added.

The 'fundamental and comprehensive' changes to marine life identified in the report include rapidly warming and acidifying oceans, changes in water circulation and expansion of dead zones within the ocean depths.

These are driving major changes in marine ecosystems: less abundant coral reefs, sea grasses and mangroves (important fish nurseries); fewer, smaller fish; a breakdown in food chains; changes in the distribution of marine life; and more frequent diseases and pests among marine organisms.

Study co-author John F Bruno, associate professor in marine science at The University of North Carolina, says greenhouse gas emissions are modifying many physical and geochemical aspects of the planet's oceans, in ways 'unprecedented in nearly a million years'.

'This is causing fundamental and comprehensive changes to the way marine ecosystems function,' Bruno warned, according to a GCI release.

These findings were published in Science

**Warming risks extinction, turns every impact**

**Cummins and Allen 10** (Ronnie, Int’l. Dir. – Organic Consumers Association, and Will, Policy Advisor – Organic Consumers Association, “Climate Catastrophe: Surviving the 21st Century”, 2-14, http://www.commondreams.org/view/2010/02/14-6)

The hour is late. Leading climate scientists such as James Hansen are literally shouting at the top of their lungs that the world needs to reduce emissions by 20-40% as soon as possible, and 80-90% by the year 2050, if we are to avoid climate chaos, **crop failures, endless wars, melting of the polar icecaps, and a disastrous rise in ocean levels**. Either we radically reduce CO2 and carbon dioxide equivalent (CO2e, which includes all GHGs, not just CO2) pollutants (currently at 390 parts per million and rising 2 ppm per year) to 350 ppm, including agriculture-derived methane and nitrous oxide pollution, or else **survival for the present and future generations is in jeopardy**. As scientists warned at Copenhagen, business as usual and a corresponding 7-8.6 degree Fahrenheit rise in global temperatures means that the carrying capacity of the Earth in 2100 will be reduced to one billion people. **Under this hellish scenario, billions will die** of thirst, cold, heat, disease, war, and starvation. If the U.S. significantly reduces greenhouse gas emissions, other countries will follow. One hopeful sign is the recent EPA announcement that it intends to regulate greenhouse gases as pollutants under the Clean Air Act. Unfortunately we are going to have to put tremendous pressure on elected public officials to force the EPA to crack down on GHG polluters (including industrial farms and food processors). Public pressure is especially critical since "just say no" Congressmen-both Democrats and Republicans-along with agribusiness, real estate developers, the construction industry, and the fossil fuel lobby appear determined to maintain "business as usual."

#### Prefer our impact—most likely because it’s scientifically backed

**Sullivan 7** (Gen. Gordon, Chair of CNA Corporation Military Advisory Board and Former Army Chief of Staff, in "National Security and the Threat of Climate Change", http://securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf)

“We seem to be standing by and, frankly, asking for perfectness in science,” Gen. Sullivan said. “People are saying they want to be convinced, perfectly. They want to know the climate science projections with 100 percent certainty. Well, we know a great deal, and even with that, there is still uncertainty. But the trend line is very clear.” “We never have 100 percent certainty,” he said. “We never have it. If you wait until you have 100 percent certainty, something bad is going to happen on the battlefield. That’s something we know. You have to act with incomplete information. You have to act based on the trend line. You have to act on your intuition sometimes.” In discussing how military leaders manage risk, Gen. Sullivan noted that significant attention is often given to the low probability/high consequence events. These events rarely occur but can have devastating consequences if they do. American families are familiar with these calculations. Serious injury in an auto accident is, for most families, a low probability/high consequence event. It may be unlikely, but we do all we can to avoid it. During the Cold War, much of America’s defense efforts focused on preventing a Soviet missile attack—the very definition of a low probability/high consequence event. Our effort to avoid such an unlikely event was a central organizing principle for our diplomatic and military strategies. When asked to compare the risks of climate change with those of the Cold War, Gen. Sullivan said, “The Cold War was a specter, but climate change is inevitable. If we keep on with business as usual, we will reach a point where some of the worst effects are inevitable.” “If we don’t act, this looks more like a high probability/high consequence scenario,” he added. Gen. Sullivan shifted from risk assessment to risk management. “In the Cold War, there was a concerted effort by all leadership—political and military, national and international—to avoid a potential conflict,” he said. “I think it was well known in military circles that we had to do everything in our power to create an environment where the national command authority—the president and his senior advisers—were not forced to make choices regarding the use of nuclear weapons.

#### Even 1% risk outweighs

**Strom 7** (Robert, Prof. Emeritus Planetary Sciences @ U. Arizona and Former Dir. Space Imagery Center of NASA, “Hot House: Global Climate Change and the Human Condition”, Online: SpringerLink, p. 246)

Keep in mind that the current consequences of global warming discussed in previous chapters are the result of a global average temperature increase of only 0.5 'C above the 1951-1980 average, and these consequences are beginning to accelerate. Think about what is in store for us when the average global temperature is 1 °C higher than today. That is already in the pipeline, and there is nothing we can do to prevent it. We can only plan strategies for dealing with the expected consequences, and reduce our greenhouse gas emissions by about 60% as soon as possible to ensure that we don't experience even higher temperatures. There is also the danger of eventually triggering an abrupt climate change that would accelerate global warming to a catastrophic level in a short period of time. If that were to happen we would not stand a chance. Even if that possibility had only a 1% chance of occurring, the consequences are so dire that it would be insane not to act. Clearly we cannot afford to delay taking action by waiting for additional research to more clearly define what awaits us. The time for action is now.

**Makes nuke war inevitable**

Campbell et al 2007 [Kurt, “The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change,” CSIS, November, p. 3, <http://www.csis.org/media/csis/pubs/071105_ageofconsequences.pdf>]

In the case of severe climate change, corresponding to an average increase in global temperature of 2.6°C by 2040, massive non-linear events in the global environment give rise to massive nonlinear societal events. In this scenario, addressed in Chapter IV, nations around the world will be overwhelmed by the scale of change and pernicious challenges, such as pandemic disease. The internal cohesion of nations will be under great stress, including in the United States, both as a result of a dramatic rise in migration and changes in agricultural patterns and water availability. The flooding of coastal communities around the world, especially in the Netherlands, the United States, South Asia, and China, has the potential to challenge regional and even national identities. Armed conflict between nations over resources, such as the Nile and its tributaries, is likely and nuclear war is possible. The social consequences range from increased religious fervor to outright chaos. In this scenario, climate change provokes a permanent shift in the relationship of humankind to nature.

#### Warming leads to global inequality risking nuclear war

#### Stott in ‘7

(Robin, Vice Chair @ Grayson Centre, Journal of the Royal Society of Medicine, “Climate change, poverty and war”, 100:9, p. 399-402)

These alterations in global ecology are aggravating the already parlous state of the world's most vulnerable populations, and if not tackled will lead to widespread social and economic devastation; the consequences of which, though caused by the rich, fall most heavily on the poor, in an all too familiar story. The impact of climate change is to widen the already substantial resource gulf between the rich and the poor. This gap is increasingly recognized as a significant cause of the increasing levels of despair and desperation among the dispossessed,2 emotions which frequently spiral into violent conflict. The widening gap is mirrored in the deteriorating health status of the poor (Box 3). The security implications of climate change have been debated in the UN Security Council; Margaret Beckett, the UK Foreign Secretary at the time, stated that ‘An unstable climate will exacerbate some of the core drivers of conflict’.3 The US Senate is debating a Bill to have climate change recognized as a security concern,4 and in a report on US National Security, senior American military personnel described climate change as a ‘threat multiplier’ for instability.5 It is not surprising that when considering the major threats to the health of humanity, the interrelated problems of climate change and the gulf between the rich and poor are seen as triggers for war, risking the ultimate health crisis of nuclear war. Resolving these interrelated risks is therefore the key to reducing the possibilities of violent conflict and improving global public health. The Intergovernmental Panel on Climate Change, the World Bank and the World Health Organization (WHO), amongst others, unequivocally state that these global problems can only be resolved through the development and implementation of a global framework.6-8 One framework which fulfils the demanding requirements of controlling atmospheric carbon dioxide levels at the same time as reducing the inequity between rich and poor is Contraction and Convergence, developed by the Global Commons Institute.9

**Warming turns Earth into Mars ---- runaway carbon will bake the planet to death  
Brandenburg and Paxson ’99** (John, Visiting Prof. Researcher @ Florida Space Institute, and Monica Rix, Science Writer, “Dead Mars, Dying Earth”, p. 232-233)

One can imagine a scenario for global catastrophe that runs similarly. If the human race adopted a mentality like the crew aboard the ship Californian—as some argue, saying that both ozone hole and global warming will disappear if statistics are properly examined, and we need do nothing about either—the following scenario could occur. The earth goes on its merry way and fossil fuels continue to power it. Rather than making painful or politically difficult choices, such as investing in fusion research or enacting a rigorous plan of conserving, the industrial world chooses to muddle through the temperature climb. Let’s imagine that America and Europe are too worried about economic dislocation to change course. The ozone hole expands, driven by a monstrous synergy with global warming that puts more catalytic ice crystals into the stratosphere, but this affects the far north and south and not the major nations’ heartlands. The seas rise, the tropics roast but the media networks no longer cover it. The Amazon rainforest becomes the Amazon desert. Oxygen levels fall, but profits rise for those who can provide it in bottles. An equatorial high pressure zone forms, forcing drought in central Africa and Brazil, the Nile dries up and the monsoons fail. Then inevitably, at some unlucky point in time, a major unexpected event occurs—a major volcanic eruption, a sudden and dramatic shift in ocean circulation or a large asteroid impact (those who think freakish accidents do not occur have paid little attention to life or Mars), or a nuclear war starts between Pakistan and India and escalates to involve China and Russia… Suddenly the gradual climb in global temperatures goes on a mad excursion as the oceans warm and release large amounts of dissolved carbon dioxide from their lower depths into the atmosphere. Oxygen levels go down precipitously as oxygen replaces lost oceanic carbon dioxide. Asthma cases double and then double again. Now a third of the world fears breathing. As the oceans dump carbon dioxide, the greenhouse effect increases, which further warms the oceans, causing them to dump even more carbon. Because of the heat, plants die and burn in enormous fires which release more carbon dioxide, and the oceans evaporate, adding more water vapor to the greenhouse. Soon, we are in what is termed a runaway greenhouse effect, as happened to Venus eons ago. The last two surviving scientists inevitably argue, one telling the other, “See! I told you the missing sink was in the ocean!” Earth, as we know it, dies. After this Venusian excursion in temperatures, the oxygen disappears into the soil, the oceans evaporate and are lost and the dead earth loses its ozone layer completely. Earth is too far from the Sun for it to be the second Venus for long. Its atmosphere is slowly lost—as is its water—because of ultraviolet bombardment breaking up all the molecules apart from carbon dioxide. As the atmosphere becomes thin the Earth becomes colder. For a short while temperatures are nearly normal, but the ultraviolet sears any life that tries to make a comeback. The carbon dioxide thins out to form a thin veneer with a few whispy clouds and dust devils. Earth becomes the second Mars—red, desolate, with perhaps a few hardy microbes surviving.

**Because climate change is irreversible we must err on the side of preventing it even if the scientific evidence is debatable**

**Sunstein 2007** Cass R.—Professor in the Department of Political Science and at the Law School of the University of Chicago (“Worst-Case Scenarios”, Harvard University Press)

Most worst-case scenarios appear to have an element of irreversibility. Once a species is lost, it is lost forever. The special concern for endangered species stems from the permanence of their loss (outside of Jurassic Park). One of the most serious fears associated with genetically modified organisms is that they might lead to irreversible ecological harm. Because some greenhouse gases stay in the atmosphere for centuries, the problem of climate change may be irreversible, at least for all practical purposes. Transgenic crops can impose irreversible losses too, because they can make pests more resistant to pesticides. If we invest significant wealth in one source of energy and neglect others, we may be effectively stuck forever, or at least for a long time. One objection to capital punishment is that errors cannot be reversed. In ordinary life, our judgments about worst-case scenarios have everything to do with irreversibility. Of course an action may be hard but not impossible to undo, and so there may be a continuum of cases, with different degrees of difficulty in reversing. A marriage can be reversed, but divorce is rarely easy; having a child is very close to irreversible; moving from New York to Paris is reversible, but moving back may be difficult. People often take steps to avoid courses of action that are burdensome rather than literally impossible to reverse. In this light, we might identify an Irreversible Harm Precautionary Principle, applicable to a subset of risks.' As a rough first approximation, the principle says this: Special steps should be taken to avoid irreversible harms, through precautions that go well beyond those that would be taken if irreversibility were not a problem. The general attitude here is "act, then learn," as opposed to the tempting alternative of "wait and learn." In the case of climate change, some people believe that research should be our first line of defense. In their view, we should refuse to commit substantial resources to the problem until evidence of serious harm is unmistakably clear.' But even assuming that the evidence is not so clear, research without action allows greenhouse gas emissions to continue, which might produce risks that are irreversible, or at best difficult and expensive to reverse. For this reason, the best course of action might well be to take precautions now as a way of preserving flexibility for future generations. In the environmental context in general, this principle suggests that regulators should proceed with far more aggressive measures than would otherwise seem justified.

**Warming causes hydrate burps ---- leads to extinction  
Atcheson 2004 (John, Geologist at several federal agencies, Baltimore Sun, “Ticking time bomb”, 12-15, L/N)**

The Arctic Council's recent report on the effects of global warming in the far north paints a grim picture: global floods, extinction of polar bears and other marine mammals, collapsed fisheries. But it ignored a ticking time bomb buried in the Arctic tundra. There are enormous quantities of naturally occurring greenhouse gasses trapped in ice-like structures in the cold northern muds and at the bottom of the seas. These ices, called clathrates, contain 3,000 times as much methane as is in the atmosphere. Methane is more than 20 times as strong a greenhouse gas as carbon dioxide. Now here's the scary part. A temperature increase of merely a few degrees would cause these gases to volatilize and "burp" into the atmosphere, which would further raise temperatures, which would release yet more methane, heating the Earth and seas further, and so on. There's 400 gigatons of methane locked in the frozen arctic tundra – enough to start this chain reaction – and the kind of warming the Arctic Council predicts is sufficient to melt the clathrates and release these greenhouse gases into the atmosphere. Once triggered, this cycle could result in runaway global warming the likes of which even the most pessimistic doomsayers aren't talking about. An apocalyptic fantasy concocted by hysterical environmentalists? Unfortunately, no. Strong geologic evidence suggests something similar has happened at least twice before. The most recent of these catastrophes occurred about 55 million years ago in what geologists call the Paleocene-Eocene Thermal Maximum (PETM), when methane burps caused rapid warming and massive die-offs, disrupting the climate for more than 100,000 years. The granddaddy of these catastrophes occurred 251 million years ago, at the end of the Permian period, when a series of methane burps came close to wiping out all life on Earth. More than 94 percent of the marine species present in the fossil record disappeared suddenly as oxygen levels plummeted and life teetered on the verge of extinction. Over the ensuing 500,000 years, a few species struggled to gain a foothold in the hostile environment. It took 20 million to 30 million years for even rudimentary coral reefs to re-establish themselves and for forests to regrow. In some areas, it took more than 100 million years for ecosystems to reach their former healthy diversity. Geologist Michael J. Benton lays out the scientific evidence for this epochal tragedy in a recent book, When Life Nearly Died: The Greatest Mass Extinction of All Time. As with the PETM, greenhouse gases, mostly carbon dioxide from increased volcanic activity, warmed the earth and seas enough to release massive amounts of methane from these sensitive clathrates, setting off a runaway greenhouse effect. The cause of all this havoc? In both cases, a temperature increase of about 10.8 degrees Fahrenheit, about the upper range for the average global increase today's models predict can be expected from burning fossil fuels by 2100. But these models could be the tail wagging the dog since they don't add in the effect of burps from warming gas hydrates. Worse, as the Arctic Council found, the highest temperature increases from human greenhouse gas emissions will occur in the arctic regions – an area rich in these unstable clathrates. If we trigger this runaway release of methane, there's no turning back. No do-overs. Once it starts, it's likely to play out all the way. Humans appear to be capable of emitting carbon dioxide in quantities comparable to the volcanic activity that started these chain reactions. According to the U.S. Geological Survey, burning fossil fuels releases more than 150 times the amount of carbon dioxide emitted by volcanoes – the equivalent of nearly 17,000 additional volcanoes the size of Hawaii's Kilauea. And that is the time bomb the Arctic Council ignored. How likely is it that humans will cause methane burps by burning fossil fuels? No one knows. But it is somewhere between possible and likely at this point, and it becomes more likely with each passing year that we fail to act. So forget rising sea levels, melting ice caps, more intense storms, more floods, destruction of habitats and the extinction of polar bears. Forget warnings that global warming might turn some of the world's major agricultural areas into deserts and increase the range of tropical diseases, even though this is the stuff we're pretty sure will happen. Instead, let's just get with the Bush administration's policy of pre-emption. We can't afford to have the first sign of a failed energy policy be the mass extinction of life on Earth. We have to act now.

**Warming implicates the environment on a much bigger order of magnitude.**

**Coates 2009** – former adjunct professor at George Washington University, President of the Kanawha Institute for the Study of the Future and was President of the International Association for Impact Assessment and was President of the Association for Science, Technology and Innovation, M.S., Hon D., FWAAS, FAAAS, (Joseph F., Futures 41, 694-705, "Risks and threats to civilization, humankind, and the earth”, ScienceDirect, WEA)

6.1. Greenhouse warming

The most important high-probability risks that the world faces in the next decades and running on indefinitely into the longer-term future, are the consequences of greenhouse warming.

Some of the effects of greenhouse warming proposed over the last 15 years, by climatologists, are: a rise in atmospheric temperature; a smearing out of the seasons—that is, an indefinite transition from spring to summer and summer to fall, and so on. A third effect is that the weather will be much spikier, deeper droughts, heavier rainfalls, heavier snow, longer frosts and longer heat waves. The rise of ocean water will occur, just from direct solar heating since warm water is less dense than cold water. The melting of the Greenland icecap and later, the melting of the Antarctic icecap will drastically enhance the effects of ocean rise. The melting could easily raise the ocean level 20 feet within a few decades. That suggests several things: Bangladesh will disappear; the Florida Everglades will be history; and, around the world, low-lying island countries will be submerged or laid low by hurricanes. The coastal areas everywhere will be more severely hit by hurricanes or their regional equivalents.

The more frightening anticipation is that **somewhere in the next five decades, the Antarctic icecap will begin to melt on a grand scale. Then the oceans could rise as much as 200–300 feet** when most of the ice in Antarctica is converted into ocean water. Relatively little has been written on the effects on the oceanic biota by enormous dilution and cooling. A specific effect we may be able to see soon is that as Greenland glaciers melt they pour cold water into the ocean. That water gradually moves out from the straits into the Atlantic itself and will intersect the Gulf Stream. To make a fairly complex story straightforward, the Gulf Stream is part of what is called the Conveyor [5]. Warm water, in the tropical zones moves north along the Central American and Florida coasts, as far as Iceland, under the label ‘‘the Gulf Stream.’’ That warm water has for many years been thought to be what gives Europe its generally mild climate. (Recent research challenges that belief.) [6]. As the Greenland glacier melt intersects the Conveyor—that is the Gulf Stream—it will dilute the salt water and also change its temperature and, thereby, interfere with the present process in which as the warm Gulf Stream gradually cools, giving up its heat to the atmosphere, and falls to the bottom of the ocean where it flows back to the tropical zones. Hence the term ‘‘Conveyor.’’ What that new development means for Europe’s climate is difficult to say precisely but it is not likely to be good. A further consequence of global warming will be a large scale shift in agricultural and ecological zones. We already have a great deal of evidence that a shift is occurring. In California, they are monitoring the spontaneous migration of plants and animals. Animals and plants in any particular latitude are moving north exactly as you would expect as their ideal climates move north. The serious implication for humankind is that virtually all the crops in the world—and certainly all the major ones that provide the bulk of our food—are grown as a complex balance in the last 70 years to optimize crop production. Factors in that balancing are gene type, soil type, rainfall, pesticides and other soil and plant treatments. All of that will have to be rebalanced in a timely way as the agricultural belts shift.

### XT – Not Too Late

**We can stop positive feedback mechanisms by curbing current emissions  
Hansen 7 –** head of NASA Goddard Institute and professor of Environmental Sciences, Columbia University [James E. Hansen. Head of the NASA Goddard Institute for Space Studies in New York City and adjunct professor in the Department of Earth and Environmental Science at Columbia University. Al Gore’s science advisor. Briefing http://arxiv.org/pdf/0706.3720, “How Can We Avert Dangerous Climate Change?” delivered to the Select Committee on Energy Independence and Global Warming, United States House of Representatives, revised 25 June 2007]

We have solved or are solving those pollution problems, at least in developed countries. But we did not address them until they hit us with full force. That approach, to wait and see and fix the problems post facto, unfortunately, will not work in the case of global climate change. On the contrary, the inertia of the climate system, the fact that much of the climate change due to gases already in the air is still ‘in the pipeline’, and the time required for economically-sensible phase-out of existing technologies together have a profound implication. They imply that ignoring the climate problem at this time, for even another decade, would serve to **lock in** future catastrophic climatic change and impacts that will unfold during the remainder of this century and beyond (references A and B). Yet this is not a reason for gloom and doom. On the contrary, there are many bright sides to the conclusion that the ‘dangerous’ level of CO2 is no more than 450 ppm, and likely much less than that. It means that we, humanity, are forced to find a way to limit atmospheric CO2 more stringently than has generally been assumed. In so doing, **many consequences of high CO2 that were considered inevitable can be avoided**. We will be able to avoid acidification of the ocean with its destruction of coral reefs and other ocean life, retain Arctic ice, limit species extinctions, prevent the U.S. West from become intolerably hot, and avoid other undesirable consequences of large global warming. It is becoming clear that we must make a choice. We can resolve to move rapidly to the next phase of the industrial revolution, and in so doing help restore wonders of the natural world, of creation, while maintaining and expanding benefits of advanced technology. Or we can continue to ignore the problem, creating a different planet, with eventual chaos for much of humanity as well as the other creatures on the planet.

**It’s not too late but if we don’t act in the next couple years we’re screwed.**

Jagger 8 – chair of the World Future Council (3/6, Bianca, Testimony to the House Select Energy Independence and Global Warming Committee, "Renewable energy", CQ Congressional Testimony, Lexis Congressional, WEA)

The threat of a global climate disaster is no longer up for debate. The majority of scientists are in agreement. Governments have previously been reluctant to accept this reality. However, notwithstanding all this sobering information, the agreements reached in Bali, were extremely weak and inadequate. I am sure we all agree with UN Secretary General Ban Ki-moon when he says that climate change is "the defining challenge of our age". How to meet that challenge, while dealing with the already devastating consequences of floods, droughts and rising temperatures, remains the great unanswered question. And the time to answer it is running out. In its final report, the United Nations Intergovernmental Panel on Climate Change stated that the world must reverse the growth of greenhouse gas emissions by 2015 to avert a global climate disaster. "If there's no action before 2012, that's too late," said Rajendra Pachauri, who headed the panel, which shared the Nobel Peace Prize in October with former U.S. Vice President Al Gore. "What we do in the next two to three years will determine our future."

**Slowing the rate is key**

Harald **Winkler et al**, Energy Research Centre, University of Cape Town, South Africa; Kevin Baumert, World Resources Institute, Washington, DC, USA; Odile Blanchard, Laboratoire d’Economie de la Production et de l’Intégration Internationale- Energie et Politiques de l’Environnement, Grenoble, France; and Sarah Burch, John Robinson University of British Columbia, Vancouver, Canada, **2007** [“What factors influence mitigative capacity?,” *Energy Policy* 35 (2007. 692–703

http://www.erc.uct.ac.za/publications/Winkler%20et%20al%202007%20mitigative%20capacity.pdf]

The concept of ‘‘responsibility’’ is well known and has been examined widely. The industrialised countries, home to about 20% of the world’s population, have contributed approximately 75% of the total of CO 2 emissions from energy sources since 1850. Since 1950, if CO 2 from deforestation is also included in the calculation, this figure shifts to just over 50% (WRI, 2003.. At the same time, it is clear that annual emissions of developing countries are growing rapidly, and will **need to be slowed** in order to promote sustainable development. On the other hand, the concept of ‘‘capability’’ to mitigate climate change is not well understood in the climate policy community, and has been less-frequently examined in the literature. This paper explores the concept of mitigative capacity, and seeks to advance the existing literature on this topic in several ways. The concept of mitigative capacity needs to be under- stood within the broader context of promoting sustainable development, a consideration that will remain essential for both the developed and developing world (Winkler et al., 2002; Munasinghe and Swart, 2005; Shukla et al., 2002; Davidson, 2002; Gupta and Bhandari, 1999; Pan, 2002; Heller and Shukla, 2003.. The IPCC’s work on emission scenarios shows that different future development path- ways will have a very large influence on eventual emission levels. Accordingly, in achieving the Convention objective, development paths are at least as important as climate policy—a factor that should not be overlooked in the efforts to broaden the participation in emission-reduction efforts in the international climate regime (see overviews in Blanchard, 2002; Bodansky et al., 2004; Höhne et al., 2004; Swart et al., 2003.. Mitigative capacity may provide an important link between development pathways and mitigation. While alternative development pathways lead to different levels of emissions, it is the capacity to change from one pathway to another—either through mitigation policy, but also through non-climate policy—that is important (Robinson et al., 2006.. Understanding the factors that influence mitigative capacity may help illuminate how the shift of development paths might occur. A closer examination of the factors should make clear where capacities are applied to climate change specifically, and where broader development policies are more influential.

### a/t: Warming Irreversible

**Energy Efficiency can stop it at 2 degrees**

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One hundred and seventy billion dollars a year invested in efforts to boost energy efficiency from now until 2020 could halve the projected growth in global energy demand. What’s more, these investments could also deliver up to half of the emission abatement required to cap the long-term concentration of atmospheric greenhouse gases at 450 parts per million, the level experts suggest will be needed to prevent the global mean temperature from rising by more than two degrees centigrade.

**That’s key**

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[1] Avoiding the most serious climate change impacts will require informed policy decisions. This in turn will require information regarding the reduction of greenhouse gas emissions required to stabilize climate in a state not too much warmer than today. A new low emission scenario is simulated in a global climate model to show how some of the impacts from climate change can be averted through mitigation. Compared to a non-intervention reference scenario, emission reductions of about 70% by 2100 are required to prevent roughly half the change in temperature and precipitation that would otherwise occur. By 2100, the resulting stabilized global climate would ensure preservation of considerable Arctic sea ice and permafrost areas. Future heat waves would be 55% less intense, and sea level rise from thermal expansion would be about 57% lower than if a non-mitigation scenario was followed. 1. Introduction [2] Climate change is taking place and mankind is very likely the cause [Intergovernmental Panel on Climate Change (IPCC), 2007]. The climate models used in the Intergovernmental Panel on Climate Change Fourth Assessment Report (IPCC AR4) showed global mean warming values for the end of the 21st century as large as 6C compared to present for the highest emission scenarios. Projected warming was largest over the continents and in the northern polar region. Arctic sea ice extent and thickness was projected to substantially decrease with some models showing a sea icefree Arctic in summer by 2100 [IPCC, 2007] accompanied by decreases in the extent of near surface permafrost [Lawrence and Slater, 2005; Lawrence et al., 2008]. [3] Some climate scientists have argued that a warming of 2C above pre-industrial temperatures (i.e., about 1C above today) is the threshold for dangerous climate change [Hansen et al., 2007]. The Council of the European Union in 2007 reported that large cuts in emissions are ‘‘necessary to ensure that the world stays within the 2C limit. . .’’ [Council of the European Union, 2004]. To keep the probability of exceeding a warming of 2C at a third or less, the atmospheric equivalent CO2 concentration (i.e., taking into account other greenhouse gases) must be stabilized at 450 ppm or below [Knutti et al., 2005]. The effective CO2 stabilization level therefore needs to be well below 450 ppm, and current concentrations are already at roughly 380 ppm CO2. While uncertainties in the carbon cycle lead to uncertainties in the allowable emissions for a 2C stabilization, it is clear that emission reductions in the 21st century need to be large. There must be similar emission reductions in other greenhouse gases (GHGs) such as methane, nitrous oxide, and CFCs. This is not true for ozone because its changes are largely not caused by direct emissions. [4] Comprehensive atmosphere ocean general circulation models (AOGCMs) in the IPCC AR4 focused only on non-intervention (non-mitigation) scenarios put together in the IPCC Special Report on Emission Scenarios (SRES) [Nakicenovic and Swart, 2000]. Six of the 35 scenarios are used as ‘‘illustrative’’ scenarios or storylines, but no likelihood was attached to any of the scenarios. They are examples of ‘‘what-if’’ cases, not necessarily representative of all possible outcomes. These scenarios assume technological progress (e.g., increase in energy efficiency) and, for example, changes in the energy sector, but only to the extent that these are economically beneficial. However, these scenarios do not include political intervention in the form of mitigation policies to regulate emissions in order to reduce climate change. [5] To explore the global and regional distributions of future climate change that could be avoided with aggressive mitigation policies such as increased use of conservation, renewables and CO2 capture and storage, simulations with a comprehensive climate model are performed here with a new low emission mitigation scenario compared to a business-asusual non-mitigation scenario. These scenarios were prepared by United States Climate Change Science Program (CCSP) scientists as part of a series of assessment reports. The CCSP report 2.1 [Clarke et al., 2007] provides scenarios in which carbon dioxide and other greenhouse gas (GHG) emissions and radiative forcings can be substantially reduced if new energy technologies and strategies are put into place.

**Our interpretation is that the negative gets three conditional world**

**Prefer it—**

**1. Offense**

**a. Neg Flex- key to let the neg shape their strategy- or else everyone would go 3-3**

**b. 2AC strategic thinking- thinking about what arguments to read is critical to developing, real world critical thinking**

**c. Education-breadth outweighs because it incentivizes out of round research**

**2. Defense**

**a. condo forces better 1ac writing, it forces preempts that solve time skew**

**b. dispo or unconditionally forces debates down to core generics with impact - that kills topic education**

**c. condo has diminishing returns every conditional world trades off with case arguments we get to make**

**d. Permutations check- each is conditional world -skews our strat too**

### 2NC Solves Prolif

#### Non-nuclear NPT states have explicitly called for the counterplan – it’s vital to resolve U.S. hypocrisy on proliferation and fears of pre-emption.

Andy Butfoy, pub. date: 10-1-08, Sr. lecturer in IR @ Monash Univ., Survival, “Washington’s Apparent Readiness to Start Nuclear War,” accessed: 9-24-09, informa serve

But Washington’s first-use stance was supposedly constrained by ‘negative security assurances’ (NSAs). NSAs are agreements not to attack other states, and are closely associated with the Nuclear Non-Proliferation Treaty (NPT).8 Non-nuclear-weapons members of the NPT want clear NSAs protecting them from the brandishing of nuclear weapons by the officially privileged members of the nuclear club as recognized by the treaty (the United States, Russia, the United Kingdom, France and China). The idea is that this club ought not to preach nuclear abstinence to others while at the same time trying to get leverage from their own weapons. Over the years, international support of the NSA framework has been repeatedly reaffirmed, but Washington has shown increasing reluctance to see its strategy tied down by this sort of agreement and has advocated relatively flexible NSAs, which contain significant get-out clauses.US reluctance to endorse restrictive NSAs not only predates the Bush presidency, it may well survive it. It is true that Bush placed US nuclear strategy into a broad policy framework that many found especially worrying, and that he sharpened Washington’s opposition to multilateral constraints on the use of nuclear weapons, but it does not necessarily follow that a change of administration will reverse the US stance. While both main presidential hopefuls, Senators Barack Obama and John McCain, appear more accommodating than Bush of the multilateral underpinning of the NPT, and more likely to package US NSA policy in terms less objectionable to the international community, it is far from clear whether either candidate, once in office, will support unequivocal and binding prohibitions on the use of US nuclear forces against non-nuclear-armed states. Not only does resistance to stronger NSAs appear almost institutionalized in Washington, but the incoming administration will likely continue to face the sort of strategic challenges that have persistently held the United States back from ruling out first-use options.

#### This conclusively solves proliferation – prevents every 1aC breakout scenario and ensures a successful Review Conference.

Jean du Preez, pub. date: 2006, dir. of the international organizations and nonproliferation program @ the Center for Nonproliferation Studies @ the Monterey Institute, Article VI forum, “The Demise of Nuclear Negative Security Assurances,” accessed: 9-24-09, http://cns.miis.edu/programs/ionp/pdfs/visions\_of\_fission.pdf

Currently, there is little left of NSAs to dismantle. In February 2002 the current administration made it clear that it no longer felt bound by any pledges and, subsequently, noted it that there is no “justification” for legally binding assurances. Thus, the United States “has clearly decided to walk away from the concept of NSAs that have for more than 30 years been central to the deal embodied in the NPT.”These grim NSA policy reversals, however, pose a quandary for U.S. policymakers. For if the United States has any hope of irreversibly dismantling North Korea’s nuclear program, if it desires to truly forestall Iranian nuclear aspirations, and if it expects to avoid a nuclear “tipping point” that ushers in dozens of new nuclear states, it will need to shed much of its unilateralism and work to improve the health of the international nonproliferation regime. Because of its unique global security role after the end of the Cold War, it is reasonable that the United States seeks, “more security for itself than most other nations require.” Unfortunately, the United States has concluded that this security is best attained though a capability and commitment to employ nuclear weapons on NNWS. What this unilateral approach guarantees is not more security but less. As states deal with their own security considerations they will determine, as North Korea seemed to have done, that those needs are best actualized by having nuclear weapons of their own. The acrimonious debate over NSAs was among the leading reasons for the failed 2005 Review Conference, in large part due to strong U.S. opposition to even discuss the issue of NSAs. Ironically, at a time when many NPT state parties and allies of the United States are increasingly concerned about attempts by the Bush administration to continue its research and possible development of new types of nuclear, the U.S. position as stated at the 2004 Prep Com and reiterated in 2005, emphasized, that “the end of the Cold War has further lessened the relevance of non-use assurances from the P-5 to the security of NPT NNWS, particularly when measured against the very real nuclear threats from NPT violators and non-state actors” and that “legally binding assurance sought by the majority of states “has no relation to contemporary threats to the NPT.” What the United States does not recognize by this statement is that the “very real threats” to its security are in part generated by its own nuclear weapon policies.