# ASU Round 4 vs. Wake Forest CD (Aff)

## 1AC

### Inherency

#### Observation One: Inherency

#### Obama pushing nuclear incentives now.

Pistilli 12 (Melissa, reporting on market-shaking news in the resource and mining investment sector with Resource Investing News since 2008, 10-11-12, “Nuclear Power Prominent in US Presidential Candidates’ Energy Policies” 10/11 <http://uraniuminvestingnews.com/12783/nuclear-power-united-states-energy-policies-romney-obama-election.html>)

The Obama administration’s energy policy supports the expansion of nuclear energy. Under Obama, the government’s 2012 budget allocated $36 billion in loan guarantees for new nuclear reactors and more than $800 million in loan guarantees for nuclear research, an IBISWorld report states. The research report also highlights Obama’s Clean Electricity Standard and its push for more electricity to be produced from zero-carbon sources. “These climate-change policies will lead to a boost in nuclear-energy production,” said IBISWorld. New nuclear reactors approved This year, the US approved construction of reactors for the first time in nearly 30 years; they are expected to come online by 2017. The Southern Company (NYSE:SO) won approval from the US Nuclear Regulatory Commission (NRC) to construct two new reactors at its Vogtle power plant near Waynesboro, Georgia. Currently, another 16 plants across the country have applied to the NRC to build 25 more reactors. Last month, the NRC issued a license that allows General Electric-Hitachi Global Laser Enrichment (GLE) to build and operate the first uranium enrichment plant with classified laser technology, a more cost-effective process than employing centrifuges. The plant “could provide a steady supply of uranium enriched right here in the US to the country’s nuclear reactors,” GLE CEO Chris Monetta said. The US Department of Energy (DOE) “has played a pivotal role in advancing a public-private cost-sharing program that supports the development of smaller reactors,” according to former Environmental Protection Agency administrator and former New Jersey Governor Christine Todd Whitman and Dr. Patrick More, co-founder and former leader of Greenpeace — current co-chairs of the Clean and Safe Energy Coalition. Where will waste go? However, the US nuclear revival has been held up by the fact that the country lacks a long-term plan for dealing with nuclear waste. Currently, most plants keep waste onsite in temporary storage pools, but that is only a short-term solution to a long-term problem. In June 2012, a federal appeals court ruled that the NRC has not provided “reasonable assurance” that it has a long-term waste-management solution — as a result, the NRC will not be approving any new projects for some time. The plan had been to move waste to a repository at Nevada’s Yucca Mountain. The US government has already signed contracts with several utilities, including Southern, for waste disposal at Yucca Mountain. The repository was supposed to open in 1998, but politics and legal issues stalled the project for years. Obama put the project on ice in 2010, appointing the Blue Ribbon Commission on America’s Nuclear Future to develop recommendations for creating a safe, long-term solution to nuclear waste management and storage. The Commission delivered its final report in January of this year, calling for the creation of a federal agency aimed at soliciting and evaluating voluntary proposals from states interested in hosting nuclear disposal areas. The idea is similar to what Romney proposed in October 2011 and would involve states offering disposal sites in exchange for monetary compensation. What next? The freeze on new reactor approvals hasn’t stopped the Obama administration from pushing forward on nuclear energy research and development. In late September, the US Department of Energy announced $13 million in funding for university-led nuclear innovation projects under the Nuclear Energy University Programs (NEUP). “The awards … build upon the Obama Administration’s broader efforts to promote a sustainable nuclear industry in the U.S. and cultivate the next generation of scientists and engineers,” the DOE press release states. The funding was awarded to research groups at the Georgia Institute of Technology, the University of Illinois at Urbana-Champaign and the University of Tennessee.

#### There’s global expansion of nuclear now – Fukushima doesn’t matter.

Marketwire 12 (5/3/12, – Part of the Paragon Report on uranium ore stock future

<http://finance.yahoo.com/news/nuclear-renaissance-back-track-122000381.html>)

NEW YORK, NY--(Marketwire -05/03/12)- Last year the Fukushima disaster in Japan started a downward spiral for companies in the Uranium Industry. Approximately one year later the industry looks to be finally recovering as the Global X Uranium ETF (URA) is up nearly 12 percent year-to-date. "Fukushima put a speed bump on the road to the nuclear renaissance," Ganpat Mani, president of Converdyn, said at a nuclear industry summit. "It's not going to delay the programs around the world." The Paragon Report examines investing opportunities in the Uranium Industry and provides equity research on Cameco Corporation (CCJ - News) and Uranium One, Inc. (UUU.TO - News). Approximately 650 million people in China and India currently are living without electricity. With the high costs of fossil fuel the most viable options for these countries would be nuclear power. Indonesia, Egypt, and Chile are among some of the nations that have plans to build their first nuclear power station, the list of countries operating atomic plants currently stands at 30. According to numbers released by the World Nuclear Association there are 61 reactors that are presently under construction, and plans to build another 162. "In two years, there will be very strong demand on the market, as new reactors start operating, and as new contracts with the existing fleet kick in," Areva SA's Chief Commercial Officer Ruben Lazo said in a previous interview.

#### But, the US is not reversing course on reprocessing.

Saillan 10 (Charles, attorney with the New Mexico Environment Department, Harvard Environmental Law Review, 2010, “DISPOSAL OF SPENT NUCLEAR FUEL IN THE UNITED STATES AND EUROPE: A PERSISTENT ENVIRONMENTAL PROBLEM”, Vol. 34, RSR)

The U.S. government’s position on reprocessing changed in 1974 when India exploded a nuclear weapon in the state of Rajasthan. 150 The weapon’s plutonium was isolated with reprocessing equipment imported for “peaceful purposes.” 151 Rightly concerned about the dangers of nuclear proliferation, President Ford announced that the United States would no longer view reprocessing as a necessary step in the nuclear fuel cycle. He called on other nations to place a three-year moratorium on the export of reprocessing technology. 152 In 1977, President Carter indefinitely deferred domestic efforts at reprocessing and continued the export embargo. 153 Although President Reagan reversed the ban on domestic reprocessing in 1981, 154 the nuclear industry has not taken the opportunity to invest in the technology. In 2006, the George W. Bush Administration proposed a Global Nuclear Energy Partner ship (“GNEP”) for expanded worldwide nuclear power production. 155 As a key component of the GNEP proposal, the United States would provide other nations with a reliable supply of nuclear fuel, and it would take back the spent fuel for reprocessing at a commercial facility in the United States, thus avoiding the spread of reprocessing technology. 156 However, the Obama Administration substantially curtailed GNEP in 2009, and is “no longer pursuing domestic commercial reprocessing.” 157

### Observation 2

#### Observation Two: Peak Uranium

#### Peak uranium is coming by 2016.

Keen 12 (Kip, Uranium supply crunch by 2016 - nuclear expert says, Mineweb, 24 January 2012, http://www.mineweb.co.za/mineweb/view/mineweb/en/page72103?oid=143915&sn=Detail&pid=102055, da 8-27-12)

A nuclear expert gave uranium supply three more years - at most - before it seriously falls behind demand from the nuclear power industry.¶ "2016: We have to have supply in the market or the lights will gradually go out in the nuclear system," said Thomas Drolet, the president of Drolet & Associates Energy Services, during a presentation at Cambridge House's Vancouver Resource Investment conference on Monday.¶ A uranium supply crunch is widely anticipated to hit the nuclear industry starting next year as Cold War era sources of uranium dry up. To illustrate the severity of the shortage that the nuclear industry faces, Drolet highlighted 2010 uranium production from mining - 118 million pounds - versus consumption: 190 million pounds.¶ "You can do the delta difference yourself," Drolet said, referring to how much of a supply gap miners will have to make up for in coming years. ¶ That uranium is "going to have to come from somewhere," he said.¶ The Fukushima nuclear disaster in Japan, Drolet argued, only delayed the onset of the coming pinch on uranium supply. But even in his "downside" analysis the uranium deficit still comes by 2015.

#### Increased domestic production of uranium is key to our tritium supply – foreign sources cannot solve.

Rowny 12 [edward, retired Lieutenant General, was chief negotiator with the rank of ambassador in the START arms control negotiations with the Soviet Union and has served as an arms control adviser and negotiator for five presidents, Roll Call, 3-29-2012,

http://www.rollcall.com/issues/57\_118/edward-rowny-safe-uranium-enrichment-should-be-us-priority-213505-1.html]

Oil may grab headlines, but nuclear power for civilian use is growing, as it should. It is efficient, extremely safe and friendly to the environment. As with oil, the U.S. would be wise to produce its own supply of enriched uranium, the fuel for nuclear power plants. Farming out the process to other nations — or to companies headquartered overseas — is risky and increases our vulnerabilities. The U.S. government should pay more attention than it has in recent years to the nation’s dwindling ability to enrich its own uranium. The consequences of doing otherwise could be dramatic. Our country could find itself at the mercy of foreigners who do not have our best interests at heart. Energy independence, a laudable aspiration for oil, is even more essential for nuclear power. Domestically produced supplies of enriched uranium are already running short. The U.S. once produced most of the world’s enriched uranium. Now we’re down to about a quarter of the world’s supply. For reasons of national security, we shouldn’t dip further. That’s why the president should be praised for requesting $150 million in next year’s National Nuclear Security Administration budget to keep uranium enrichment alive on our soil. In the meantime, Chu has asked Congress for the authority to reallocate his current budget resources for that purpose until next year’s budget is enacted. Without this cash infusion, American technology at a major facility in rural Ohio will face an uncertain future. We can’t afford the uncertainty. Military considerations also play a role here. Nuclear weapons, while thankfully on the decline, still exist and must be maintained and updated. International treaties mandate that tritium, a rare, radioactive isotope that’s a byproduct of enriched uranium use in nuclear reactors and is critical to the proper, safe functioning of nuclear weapons, must be made with U.S. technology. Unless U.S. technology is available to make the enriched uranium needed to produce tritium, our national security will be at risk.

#### That’s key to the usefulness of our nuclear weapons.

Gaffney 10 (Frank, founder and president of the Center for Security Policy, “There Goes the Nuclear Deterrent”, Breitbart, 10-14-2010, <http://www.breitbart.com/Big-Peace/2010/10/14/There-Goes-the-Nuclear-Deterrent>)

The House Armed Services Committee warned in 1993 that the deterrent was being subjected to “erosion by design” – and thanks to these sorts of deliberate actions – those chickens are coming home to roost today, with a vengeance. ¶ Now, we learn that the stockpile is literally running out of gas. ¶ A key ingredient used to boost the explosive power of thermonuclear devices is a gas called tritium. Unlike other radioactive materials used in such weapons (notably, plutonium and uranium), the usefulness of tritium degrades fairly quickly – its “half-life” is only about 12 years. As a result, the tritium reservoirs in our bombs and missile warheads must be regularly refueled in order for those weapons to remain operable.

#### Reliability underpins the effectiveness of our deterrent.

Caves 10 (John, Senior Research Fellow in the Center for the Study of Weapons of Mass Destruction at the National Defense University, “Avoiding a Crisis of Confidence in the U.S. Nuclear Deterrent”, January , Strategic Forum, No. 252, Institute for National Strategic Studies¶ National Defense University,

<http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ada514285>)

As an emerging nuclear-armed near peer like China narrows the wide military power gap that currently separates it from the United States, Washington could find itself more, rather than less, reliant upon its nuclear forces to deter and contain potential challenges from great power competitors. The resulting security dynamics may resemble the Cold War more than the U.S. “unipolar moment” of the 1990s and early 2000s. Concerns about Longterm Reliability With continuing U.S. dependence upon nuclear forces to deter conflict and contain challenges from (re-)emerging great power(s), perceptions of the reliability, adequacy, and credibility of those forces will determine how well they serve those purposes. Perception is all important when it comes to nuclear weapons, which have not been operationally employed since 1945 and not tested (by the United States) since 1992, and, hopefully, will never have to be employed or tested again. If U.S. nuclear forces are to deter other nuclear-armed great powers, the individual weapons must be perceived to work as intended (reliability), the overall forces must be perceived as adequate to deny the adversary the achievement of his goals regardless of his actions (adequacy), and U.S. leadership must be perceived as prepared to employ the forces under conditions that it has communicated via its declaratory policy (credibility) These perceptions must be, of course, those of the leadership of adversaries that we seek to deter (as well as of the allies that we seek to assure), but they also need to be those of the U.S. leadership lest our leaders fail to convey the confidence and resolve necessary to shape adversaries’ perceptions to achieve deterrence. Weapons reliability is the essential foundation for deterrence since there can be no adequacy or credibility without it. Reliability is a serious emerging issue for U.S. nuclear weapons. As Secretary of Defense Robert Gates observed, “No one has designed a nuclear weapon in the United States since the 1980s, and no one has built a new one since the early 1990s.” 8 Indeed, the United States is the only nuclear weapons state party to the Nuclear Nonproliferation Treaty (NPT) that does not have the capability to produce a new nuclear warhead. 9 Russia, China, and France currently are modernizing their nuclear weapons systems, and the United Kingdom has decided to replace its current Vanguard-class ballistic missile submarines and is investing in the sustainment of its nuclear warhead maintenance and replacement capabilities. 10 In lieu of a nuclear weapons production infrastructure and nuclear testing, the United States relies upon its Stockpile Stewardship Program (utilizing computer simulation and component testing) to evaluate and validate the continued viability of existing warheads; service life extension programs to prolong the operational life of warheads (and delivery vehicles); and a stockpile of nonoperationally deployed warheads to provide spares for destructive component testing under the Stockpile Stewardship Program and a reserve to be pressed back into service to augment operationally deployed warheads, if deemed necessary. The Achilles’ heel of this current approach to ensuring the reliability of U.S. nuclear forces is the possible advent of critical systemic failure(s) in entire classes of aging warheads. That such failures could occur can be anticipated as a general matter for any aging system, particularly one that is no longer physically tested as a complete assembly. Specific failures, however, cannot be accurately forecast since the United States has no prior experience with warheads of this age. The potential for such failures emerging is increased by the relatively narrow performance margins to which the warheads were engineered by Cold War nuclear weapons designers tasked with maximizing the number and explosive power of warheads that could be delivered by a ballistic missile. 11 U.S. nuclear weapons scientists have warned of this problem for years. 12 The preceding administration proposed to address this problem by reconstituting and exercising the infrastructure needed to develop and produce nuclear weapons. The proposal involved both facilities (consolidation, refurbishment, and replacement), work force (maintenance of highly specialized nuclear weapons skills), and nuclear weapons design, development, and production work (for refurbishment and replacement of existing warheads). The Department of Energy’s National Nuclear Security Administration, which is responsible for the nuclear weapons infrastructure, expected that the infrastructure transformation plan could be implemented within its existing budget projections if the savings realized from the plan were allowed to be reinvested into the infrastructure. 13 While some aspects of the proposed new infrastructure have moved forward (for example, the National Ignition Facility), much of the plan has not because Congress has declined to provide the requisite funding.

#### Nuclear deterrence necessary to deter rogue states, CBW attacks, power challengers, and allied proliferation - impact is extinction.

Schneider 9 (Mark, Senior Analyst with the National Institute for Public Policy, May/April 2009 “The Future of the US Nuclear Deterrent” Comparative Strategy, p345-360)

According to the Pentagon’s Quadrennial Defense Review, the United States must maintain a “robust nuclear deterrent, which remains a keystone of U.S. national power.”98 The reason should be self evident—without a nuclear deterrent the United States could be destroyed as an industrial civilization and our conventional forces could be defeated by a state with grossly inferior conventional capability but powerful WMD. We cannot afford to ignore existing and growing threats to the very existence of the United States as a national entity. Missile defenses and conventional strike capabilities, while critically important elements of deterrence and national power, simply can’t substitute for nuclear deterrence. In light of the emerging “strategic partnership” between Russia and China and their emphasis on nuclear weapons it would be foolish indeed to size U.S. strategic nuclear forces as if the only threat we face is that of rogue states and discard the requirement that the U.S. nuclear deterrent be “second to none.” Ignoring the PRC nuclear threat because of Chinese “no first use” propaganda is just as irresponsible. Absent a nuclear deterrent to their WMD use, rogue states could defeat our forces by the combination of few nuclear EMP weapons and large chemical and biological attacks. The situation would be much worse if they build a more extensive nuclear strike capability as has been reported. Freezing U.S. nuclear forces at the technical level of the Reagan administration will assure that, within two decades, Russia, China, India, and probably others will be technically superior and U.S. deterrence ability against CBW attack will be reduced. United States nuclear forces must be modernized and tailored to enhance deterrence and damage limitation against the rogue WMD threat. WMD capabilities have given otherwise inconsequential states the ability to kill millions of people. The right combination of missile defense and conventional and nuclear strike capabilities provide the best deterrent and damage limiting capability against the rogue state threat. We must not ignore the requirement to provide extended deterrence to our allies. British and French nuclear forces are not large enough, and these nations are not perceived as tough enough, to provide a deterrent for NATO Europe against Russia. In the Far East, there is literally no nuclear deterrent capability against China other than that provided by the United States. Failure to provide a credible deterrent will result in a wave of nuclear proliferation with serious national security implications. When dealing with the rogue states, the issue is not the size of the U.S. nuclear deterrent but the credibility of its use in response to chemical or biological weapons use and its ability to conduct low collateral damage nuclear attacks against WMD capabilities and delivery systems including very hard underground facilities for purposes of damage limitation. We must also have the capability to respond promptly. The United States nuclear guarantee is a major deterrent to proliferation. If we do not honor that guarantee, or devalue it, many more nations will obtain nuclear weapons. If arms control really becomes a substitute for nuclear deterrence and defense, it may very well precipitate the most destructive war in history. Effective verification is essentially impossible, and verification is not a substitute for compliance. Today, arms control has become part of the problem rather than a solution to the problem. The abolition of the in-kind deterrent to CBW use—which deterred CBW use in World War II—is making the world more unsafe almost on a daily basis. The START and Intermediate-Range Nuclear Forces (INF) Treaties prevent or inhibit the development of conventional strike capabilities with enhanced ability to counter WMD. The demise of the ABM Treaty, while very useful, does not completely address the problem of legacy arms control and its constraints upon U.S. conventional capabilities.

#### Adoption of reprocessing solves U.S. uranium needs

Sayre 11 (Edwin, engineering consultant, “Commercial Value of Used Nuclear Fuel Reprocessed with Elements Separated, Purified and Reduced to Metals”, NIST, 2011, <http://www.nist.gov/tip/wp/pswp/upload/164_commercial_value_used_nuclear_fuel_reprocessed.pdf>)

The commercial value of the elements in the used fuel as indicated in Table 1 is a big ¶ surprise for most people. The commercial value of over twenty million dollars a year each 1000 MW reactor is based on today’s value for the rare metals in the fission ¶ products and the fissile metals to be recycled in fuel. The accelerated use of these ¶ elements with future technology will probably make them worth more than double that ¶ commercial value in 2050.¶ The United States should be interested in determining the cost of reprocessing the used ¶ fuel and preparing the elements for commercial use. It is estimated roughly that there ¶ will be a considerable profit in the processing of the elements in the used fuel. DOE is ¶ supporting technical proposals for the Advanced Fuel Cycle Initiative (AFCI) for ¶ computing and simulating the operations required for processing the used fuel and ¶ separating out the commercial elements to determine the cost. There will be further ¶ programs to optimize the technology for the processing and establishing the required ¶ facilities. It would be economically ideal to start up the first reprocessing facilities by ¶ 2020 to start using the used fuel with over 50 years of aging. ¶ Many other countries are moving forward in the reprocessing and recycling the actinides ¶ in fast breeder reactors to make fuel from all low enriched fuel for the future use in the ¶ thermal reactor power plants. There is enough used nuclear fuel and the uranium 238 ¶ stored away to meet all of the US energy requirements for the next 500 years with the ¶ proper technical planning and program operation.

### Observation 3

#### Observation Three: Warming

#### Warming is real and anthropogenic – carbon dioxide increase, polar ice records, melting glaciers, sea level rise all prove.

Prothero 12 (Donald, Lecturer in Geobiology at Cal Tech and Professor of Geology at Occidental College, 3-1-12, “How We Know Global Warming is Real and Human Caused," Skeptic, vol 17 no 2, EBSCO)

Converging Lines of Evidence¶ How do we know that global warming is real and primarily human caused? There are numerous lines of evidence that converge toward this conclusion.¶ 1. Carbon Dioxide Increase.¶ Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Little Ice Age in die 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, die timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil.¶ 2. Melting Polar Ice Caps.¶ The polar icecaps are thinning and breaking up at an alarming rate. In 2000, my former graduate advisor Malcolm McKenna was one of the first humans to fly over the North Pole in summer time and see no ice, just open water. The Arctic ice cap has been frozen solid for at least the past 3 million years (and maybe longer),4 but now the entire ice sheet is breaking up so fast that by 2030 (and possibly sooner) less than half of the Arctic will be ice covered in the summer.5 As one can see from watching the news, this is an ecological disaster for everything that lives up there, from the polar bears to the seals and walruses to the animals they feed upon, to the 4 million people whose world is melting beneath their feet. The Antarctic is thawing even faster. In February-March 2002, the Larsen B ice shelf - over 3000 square km (the size of Rhode Island) and 220 m (700 feet) thick- broke up in just a few months, a story typical of nearly all the ice shelves in Antarctica. The Larsen B shelf had survived all the previous ice ages and interglacial warming episodes over the past 3 million years, and even the warmest periods of the last 10,000 years- yet it and nearly all the other thick ice sheets on the Arctic, Greenland, and Antarctic are vanishing at a rate never before seen in geologic history.¶ 3. Melting Glaciers.¶ Glaciers are all retreating at the highest rates ever documented. Many of those glaciers, along with snow melt, especially in the Himalayas, Andes, Alps, and Sierras, provide most of the freshwater that the populations below the mountains depend upon - yet this fresh water supply is vanishing. Just think about the percentage of world's population in southern Asia (especially India) that depend on Himalayan snowmelt for their fresh water. The implications are staggering. The permafrost that once remained solidly frozen even in the summer has now Üiawed, damaging the Inuit villages on the Arctic coast and threatening all our pipelines to die North Slope of Alaska. This is catastrophic not only for life on the permafrost, but as it thaws, the permafrost releases huge amounts of greenhouse gases which are one of the major contributors to global warming. Not only is the ice vanishing, but we have seen record heat waves over and over again, killing thousands of people, as each year joins the list of the hottest years on record. (2010 just topped that list as the hottest year, surpassing the previous record in 2009, and we shall know about 2011 soon enough). Natural animal and plant populations are being devastated all over the globe as their environments change.6 Many animals respond by moving their ranges to formerly cold climates, so now places that once did not have to worry about disease-bearing mosquitoes are infested as the climate warms and allows them to breed further north.¶ 4. Sea Level Rise.¶ All that melted ice eventually ends up in the ocean, causing sea levels to rise, as it has many times in the geologic past. At present, the sea level is rising about 3-4 mm per year, more than ten times the rate of 0.10.2 mm/year that has occurred over the past 3000 years. Geological data show Üiat ttie sea level was virtually unchanged over the past 10,000 years since the present interglacial began. A few mm here or there doesn't impress people, until you consider that the rate is accelerating and that most scientists predict sea levels will rise 80-130 cm in just the next century. A sea level rise of 1.3 m (almost 4 feet) would drown many of the world's low-elevation cities, such as Venice and New Orleans, and low-lying countries such as the Netherlands or Bangladesh. A number of tiny island nations such as Vanuatu and the Maldives, which barely poke out above the ocean now, are already vanishing beneath the waves. Eventually their entire population will have to move someplace else.7 Even a small sea level rise might not drown all these areas, but they are much more vulnerable to the large waves of a storm surge (as happened with Hurricane Katrina), which could do much more damage than sea level rise alone. If sea level rose by 6 m (20 feet), most of die world's coastal plains and low-lying areas (such as the Louisiana bayous, Florida, and most of the world's river deltas) would be drowned.¶ Most of the world's population lives in lowelevation coastal cities such as New York, Boston, Philadelphia, Baltimore, Washington, D.C., Miami, and Shanghai. All of those cities would be partially or completely under water with such a sea level rise. If all the glacial ice caps melted completely (as they have several times before during past greenhouse episodes in the geologic past), sea level would rise by 65 m (215 feet)! The entire Mississippi Valley would flood, so you could dock an ocean liner in Cairo, Illinois. Such a sea level rise would drown nearly every coastal region under hundreds of feet of water, and inundate New York City, London and Paris. All that would remain would be the tall landmarks such as the Empire State Building, Big Ben, and the Eiffel Tower. You could tie your boats to these pinnacles, but the rest of these drowned cities would lie deep underwater.

#### Scientific consensus goes aff – 97% of the most qualified scientists in the field agree

Anderegg, et al. 10 (William (Department of Biology, Stanford University); James Prall (Electrical and Computer Engineering, University of Toronto); Jacob Harold (William and Flora Hewlett Foundation); and Stephen Schneider (Department of Biology, Stanford University and Woods Institute for the Environment, Stanford University), “Expert credibility in climate change”, PNAS, Vol. 17, No. 27, July 6, 2010, RSR

\*\*Note: ACC = Anthropogenic Climate Change, UE = those unconvinced by evidence and CE = those convinced by evidence.)

The UE group comprises only 2% of the top 50 climate researchers as ranked by expertise (number of climate publications), 3% of researchers of the top 100, and 2.5% of the top 200, excluding researchers present in both groups (Materials and Methods). This result closely agrees with expert surveys, indicating that ≈97% of self-identiﬁed actively publishing climate scientists agree with the tenets of ACC (2). Furthermore, this ﬁnding complements direct polling of the climate researcher community, which yields qualitative and self-reported researcher expertise (2). Our ﬁndings capture the added dimension of the distribution of researcher expertise, quantify agreement among the highest expertise climate researchers, and provide an independent assessment of level of scientiﬁc consensus concerning ACC. In addition to the striking difference in number of expert researchers between CE and UE groups, the distribution of expertise of the UE group is far below that of the CE group (Fig. 1). Mean expertise of the UE group was around half (60 publications) that of the CE group (119 publications; Mann–Whitney U test: W = 57,020; P < 10 −14 ), as was median expertise (UE = 34 publications; CE = 84 publications). Furthermore, researchers with fewer than 20 climate publications comprise ≈80% the UE group, as opposed to less than 10% of the CE group. This indicates that the bulk of UE researchers on the most prominent multisignatory statements about climate change have not published extensively in the peer-reviewed climate literature. We examined a subsample of the 50 most-published (highestexpertise) researchers from each group. Such subsampling facilitates comparison of relative expertise between groups (normalizing differences between absolute numbers). This method reveals large differences in relative expertise between CE and UE groups (Fig. 2). Though the top-published researchers in the CE group have an average of 408 climate publications (median = 344), the top UE researchers average only 89 publications (median = 68; Mann– Whitney U test: W = 2,455; P < 10 −15 ). Thus, this suggests that not all experts are equal, and top CE researchers have much stronger expertise in climate science than those in the top UE group. Finally, our prominence criterion provides an independent and approximate estimate of the relative scientiﬁc signiﬁcance of CE and UE publications. Citation analysis complements publication analysis because it can, in general terms, capture the quality and impact of a researcher’s contribution—a critical component to overall scientiﬁc credibility—as opposed to measuring a researcher’s involvement in a ﬁeld, or expertise (Materials and Methods). The citation analysis conducted here further complements the publication analysis because it does not examine solely climaterelevant publications and thus captures highly prominent researchers who may not be directly involved with the climate ﬁeld. We examined the top four most-cited papers for each CE and UE researcher with 20 or more climate publications and found immense disparity in scientiﬁc prominence between CE and UE communities (Mann–Whitney U test: W = 50,710; P < 10 −6 ; Fig. 3). CE researchers’ top papers were cited an average of 172 times, compared with 105 times for UE researchers. Because a single, highly cited paper does not establish a highly credible reputation but might instead reﬂect the controversial nature of that paper (often called the single-paper effect), we also considered the average the citation count of the second through fourth most-highly cited papers of each researcher. Results were robust when only these papers were considered (CE mean: 133; UE mean: 84; Mann–Whitney U test: W = 50,492; P < 10 −6 ). Results were robust when all 1,372 researchers, including those with fewer than 20 climate publications, were considered (CE mean: 126; UE mean: 59; Mann–Whitney U test: W = 3.5 × 10 5 ; P < 10 −15 ). Number of citations is an imperfect but useful benchmark for a group’s scientiﬁc prominence (Materials and Methods), and we show here that even considering all (e.g., climate and nonclimate) publications, the UE researcher group has substantially lower prominence than the CE group. We provide a large-scale quantitative assessment of the relative level of agreement, expertise, and prominence in the climate researcher community. We show that the expertise and prominence, two integral components of overall expert credibility, of climate researchers convinced by the evidence of ACC vastly overshadows that of the climate change skeptics and contrarians. This divide is even starker when considering the top researchers in each group. Despite media tendencies to present both sides in ACC debates (9), which can contribute to continued public misunderstanding regarding ACC (7, 11, 12, 14), not all climate researchers are equal in scientiﬁc credibility and expertise in the climate system. This extensive analysis of the mainstream versus skeptical/contrarian researchers suggests a strong role for considering expert credibility in the relative weight of and attention to these groups of researchers in future discussions in media, policy, and public forums regarding anthropogenic climate change.

#### We must act quickly with long term technological innovation to avoid the irreversible climate change triggered by 2°C.

Peters, et al. 12(Glen (Center for International Climate and Environmental Research – Oslo); Robbie Andrew (Center for International Climate and Environmental Research – Oslo); Tom Boden (Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory); Josep Canadell (Global Carbon Project, CSIRO Marine and Atmospheric Research, Canberra, Australia); Philippe Ciais (Laboratoire des Sciences du Climat et de l’Environnement, Gif sur Yvette, France); Corinne Le Quéré (Tyndall Centre for Climate Change Research, University of East Anglia, Norwich, UK); Gregg Marland (Research Institute for Environment, Energy, and Economics, Appalachian State University); Michael R. Raupach (Global Carbon Project, CSIRO Marine and Atmospheric Research, Canberra, Australia); and Charlie Wilson (Tyndall Centre for Climate Change Research, University of East Anglia, Norwich, UK), “The challenge to keep global warming below 2 °C”, Nature Climate Change, 12-2-12, RSR)

It is important to regularly re-assess the relevance of emissions scenarios in light of changing global circumstances3,8. In the past, decadal trends in CO2 emissions have responded slowly to changes in the underlying emission drivers because of inertia and path dependence in technical, social and political systems9. Inertia and path dependence are unlikely to be affected by short-term fluctuations2,3,9 — such as financial crises10 — and it is probable that emissions will continue to rise for a period even after global mitigation has started11. Thermal inertia and vertical mixing in the ocean, also delay the temperature response to CO2 emissions12. Because of inertia, path dependence and changing global circumstances, there is value in comparing observed decadal emission trends with emission scenarios to help inform the prospect of different futures being realized, explore the feasibility of desired changes in the current emission trajectory and help to identify whether new scenarios may be needed. Global CO2 emissions have increased from 6.1±0.3 Pg C in 1990 to 9.5±0.5 Pg C in 2011 (3% over 2010), with average annual growth rates of 1.9% per year in the 1980s, 1.0% per year in the 1990s, and 3.1% per year since 2000. We estimate that emissions in 2012 will be 9.7±0.5 Pg C or 2.6% above 2011 (range of 1.9–3.5%) and 58% greater than 1990 (Supplementary Information and ref. 13). The observed growth rates are at the top end of all four generations of emissions scenarios (Figs 1 and 2). Of the previous illustrative IPCC scenarios, only IS92-E, IS92-F and SRES A1B exceed the observed emissions (Fig. 1) or their rates of growth (Fig. 2), with RCP8.5 lower but within uncertainty bounds of observed emissions. Observed emission trends are in line with SA90-A, IS92-E and IS92-F, SRES A1FI, A1B and A2, and RCP8.5 (Fig. 2). The SRES scenarios A1FI and A2 and RCP8.5 lead to the highest temperature projections among the scenarios, with a mean temperature increase of 4.2–5.0 °C in 2100 (range of 3.5–6.2 °C)14, whereas the SRES A1B scenario has decreasing emissions after 2050 leading to a lower temperature increase of 3.5 °C (range 2.9–4.4°C)14. Earlier research has noted that observed emissions have tracked the upper SRES scenarios15,16 and Fig. 1 confirms this for all four scenario generations. This indicates that the space of possible pathways could be extended above the top-end scenarios to accommodate the possibility of even higher emission rates in the future. The new RCPs are particularly relevant because, in contrast to the earlier scenarios, mitigation efforts consistent with longterm policy objectives are included among the pathways2,. RCP3-PD (peak and decline in concentration) leads to a mean temperature increase of 1.5 °C in 2100 (range of 1.3–1.9 °C)14. RCP3–PD requires net negative emissions (for example, bioenergy with carbon capture and storage) from 2070, but some scenarios suggest it is possible to stay below 2 °C without negative emissions17–19. RCP4.5 and RCP6 — which lie between RCP3–PD and RCP8.5 in the longer term — lead to a mean temperature increase of 2.4 °C (range of 1.0–3.0 °C) and 3.0 °C (range of 2.6–3.7 °C) in 2100, respectively14. For RCP4.5, RCP6 and RCP8.5, temperatures will continue to increase after 2100 due to on-going emissions14 and inertia in the climate system12. Current emissions are tracking slightly above RCP8.5, and given the growing gap between the other RCPs (Fig. 1), significant emission reductions are needed by 2020 to keep 2 °C as a feasible goal18–20. To follow an emission trend that can keep the temperature increase below 2 °C (RCP3-PD) requires sustained global CO2 mitigation rates of around 3% per year, if global emissions peak before 202011,19. A delay in starting mitigation activities will lead to higher mitigation rates11, higher costs21,22, and the target of remaining below 2 °C may become unfeasible18,20. If participation is low, then higher rates of mitigation are needed in individual countries, and this may even increase mitigation costs for all countries22. Many of these rates assume that negative emissions will be possible and affordable later this century11,17,18,20. Reliance on negative emissions has high risks because of potential delays or failure in the development and large-scale deployment of emerging technologies such as carbon capture and storage, particularly those connected to bioenergy17,18. Although current emissions are tracking the higher scenarios, it is still possible to transition towards pathways consistent with keeping temperatures below 2 °C (refs 17,19,20). The historical record shows that some countries have reduced CO2 emissions over 10-year periods, through a combination of (non-climate) policy intervention and economic adjustments to changing resource availability. The oil crisis of 1973 led to new policies on energy supply and energy savings, which produced a decrease in the share of fossil fuels (oil shifted to nuclear) in the energy supply of Belgium, France and Sweden, with emission reductions of 4–5% per year sustained over 10 or more years (Supplementary Figs S17–19). A continuous shift to natural gas — partially substituting coal and oil — led to sustained mitigation rates of 1–2% per year in the UK in the 1970s and again in the 2000s, 2% per year in Denmark in the 1990–2000s, and 1.4% per year since 2005 in the USA (Supplementary Figs S10–12). These examples highlight the practical feasibility of emission reductions through fuel substitution and efficiency improvements, but additional factors such as carbon leakage23 need to be considered. These types of emission reduction can help initiate a transition towards trajectories consistent with keeping temperatures below 2 °C, but further mitigation measures are needed to complete and sustain the reductions. Similar energy transitions could be encouraged and co-ordinated across countries in the next 10 years using available technologies19, but well-targeted technological innovations24 are required to sustain the mitigation rates for longer periods17. To move below the RCP8.5 scenario — avoiding the worst climate impacts — requires early action17,18,21 and sustained mitigation from the largest emitters22 such as China, the United States, the European Union and India. These four regions together account for over half of global CO2 emissions, and have strong and centralized governing bodies capable of co-ordinating such actions. If similar energy transitions are repeated over many decades in a broader range of developed and emerging economies, the current emission trend could be pulled down to make RCP3‑PD, RCP4.5 and RCP6 all feasible futures. A shift to a pathway with the highest likelihood to remain below 2 °C above preindustrial levels (for example, RCP3-PD), requires high levels of technological, social and political innovations, and an increasing need to rely on net negative emissions in the future11,17,18. The timing of mitigation efforts needs to account for delayed responses in both CO2 emissions9 (because of inertia in technical, social and political systems) and also in global temperature12 (because of inertia in the climate system). Unless large and concerted global mitigation efforts are initiated soon, the goal of remaining below 2 °C will very soon become unachievable.

#### Scenario one is biodiversity

#### Warming and CO2 emissions kill biodiversity – newest research shows that ecosystems are on the brink due to human activity.

Barnosky et al 12 (Anthony (Department of Integrative Biology, University of California, Berkeley); Elizabeth Hadly (Department of Biology, Stanford University); Jordi Bascompte (Integrative Ecology Group, Estacion Biologica de Donana, Sevilla, Spain); Eric Berlow (TRU NORTH Labs, Berkeley, California); James H. Brown (Department of Biology, The University of New Mexico); Mikael Fortelius (Department of Geosciences and Geography and Finnish Museum of Natural History); Wayne Getz (Department of Environmental Science, Policy, and Management, University of California, Berkeley); John Harte (Department of Environmental Science, Policy, and Management, University of California, Berkeley); Alan Hastings (Department of Environmental Science and Policy, University of California – Davis); Pablo Marquet (Departamento de Ecologıa, Facultad de Ciencias Biologicas, Pontificia Universidad Catolica de Chile); Neo Martinez (Pacific Ecoinformatics and Computational Ecology Lab); Arne Mooers (Department of Biological Sciences, Simon Fraser University); Peter Roopnarine (California Academy of Sciences); Geerta Vermeij (Department of Geology, University of California – Davis); John W. Williams (Department of Geography, University of Wisconsin); Rosemary Gilespie (Department of Environmental Science, Policy, and Management, University of California, Berkeley); Justin Kitzes (Department of Environmental Science, Policy, and Management, University of California, Berkeley); Charles Marshall (Department of Integrative Biology, University of California, Berkeley); Nicholas Matzke (Department of Integrative Biology, University of California, Berkeley); David Mindell ( Department of Biophysics and Biochemistry, University of California, San Francisco); Eloy Revilla (Department of Conservation Biology, Estacion Biologica de Donana); and Adam B. Smith (Center for Conservation and Sustainable Development, Missouri Botanical Garden), “Approaching a state shift in Earth’s biosphere”, Nature, May 2012, RSR)

As a result of human activities, direct local-scale forcings have accumulated to the extent that indirect, global-scale forcings of biological change have now emerged. Direct forcing includes the conversion of ,43% of Earth’s land to agricultural or urban landscapes, with much of the remaining natural landscapes networked with roads 1,2,34,35 . This exceeds the physical transformation that occurred at the last global-scale critical transition, when ,30% of Earth’s surface went from being covered by glacial ice to being ice free. The indirect global-scale forcings that have emerged from human activities include drastic modification of how energy flows through the global ecosystem. An inordinate amount of energy now is routed through one species, Homo sapiens. Humans commandeer ,20–40% of global net primary productivity 1,2,35 (NPP) and decrease overall NPP through habitat degradation. Increasing NPP regionally through atmospheric and agricultural deposition of nutrients (for example nitrogen and phosphorus) does not make up the shortfall 2 . Second, through the release of energy formerly stored in fossil fuels, humans have substantially increased the energy ultimately available to power the global ecosystem. That addition does not offset entirely the human appropriation of NPP, because the vast majority of that ‘extra’ energy is used to support humans and their domesticates, the sum of which comprises large-animal biomass that is far beyond that typical of pre-industrial times 27 . A decrease in this extra energy budget, which is inevitable if alternatives do not compensate for depleted fossil fuels, is likely to impact human health and economies severely 28 , and also to diminish biodiversity 27 , the latter because even more NPP would have to be appropriated by humans, leaving less for other species 36 . By-products of altering the global energy budget are major modifications to the atmosphere and oceans. Burning fossil fuels has increased atmospheric CO2 concentrations by more than a third (,35%) with respect to pre-industrial levels, with consequent climatic disruptions that include a higher rate of global warming than occurred at the last global-scale state shift 37 . Higher CO2 concentrations have also caused the ocean rapidly to become more acidic, evident as a decrease in pH by ,0.05 in the past two decades 38 . In addition, pollutants from agricultural run-off and urban areas have radically changed how nutrients cycle through large swaths of marine areas 16 . Already observable biotic responses include vast ‘dead zones’ in the near-shore marine realm39 , as well as the replacement of .40% of Earth’s formerly biodiverse land areas with landscapes that contain only a few species of crop plants, domestic animals and humans 3,40 . Worldwide shifts in species ranges, phenology and abundances are concordant with ongoing climate change and habitat transformation 41 . Novel communities are becoming widespread as introduced, invasive and agricultural species integrate into many ecosystems 42 . Not all community modification is leading to species reductions; on local and regional scales, plant diversity has been increasing, owing to anthropogenic introductions 42 , counter to the overall trend of global species loss 5,43 . However, it is unknown whether increased diversity in such locales will persist or will eventually decrease as a result of species interactions that play out over time. Recent and projected 5,44 extinction rates of vertebrates far exceed empirically derived background rates 25 . In addition, many plants, vertebrates and invertebrates have markedly reduced their geographic ranges and abundances to the extent that they are at risk of extinction 43 . Removal of keystone species worldwide, especially large predators at upper trophic levels, has exacerbated changes caused by less direct impacts, leading to increasingly simplified and less stable ecological networks 39,45,46 . Looking towards the year 2100, models forecast that pressures on biota will continue to increase. The co-opting of resources and energy use by humans will continue to increase as the global population reaches 9,500,000,000 people (by 2050), and effects will be greatly exacerbated if per capita resource use also increases. Projections for 2100 range from a population low of 6,200,000,000 (requiring a substantial decline in fertility rates) to 10,100,000,000 (requiring continued decline of fertility in countries that still have fertility above replacement level) to 27,000,000,000 (if fertility remains at 2005–2010 levels; this population size is not thought to be supportable; ref. 31). Rapid climate change shows no signs of slowing. Modelling suggests that for ,30% of Earth, the speed at which plant species will have to migrate to keep pace with projected climate change is greater than their dispersal rate when Earth last shifted from a glacial to an interglacial climate 47 , and that dispersal will be thwarted by highly fragmented landscapes. Climates found at present on 10–48% of the planet are projected to disappear within a century, and climates that contemporary organisms have never experienced are likely to cover 12–39% of Earth 48 . The mean global temperature by 2070 (or possibly a few decades earlier) will be higher than it has been since the human species evolved. The magnitudes of both local-scale direct forcing and emergent globalscaleforcing are much greater than those that characterized the last globalscale state shift, and are not expected to decline any time soon. Therefore, the plausibility of a future planetary state shift seems high, even though considerable uncertainty remains about whether it is inevitable and, if so, how far in the future it may be. The clear potential for a planetary-scale state shift greatly complicates biotic forecasting efforts, because by their nature state shifts contain surprises. Nevertheless, some general expectations can be gleaned from the natural experiments provided by past global-scale state shifts. On the timescale most relevant to biological forecasting today, biotic effects observed in the shift from the last glacial to the present interglacial (Box 1) included many extinctions 30,49–51 ; drastic changes in species distributions, abundances and diversity; and the emergence of novel communities 49,50,52–54 . New patterns of gene flow triggered new evolutionary trajectories 55–58 , but the time since then has not been long enough for evolution to compensate for extinctions. At a minimum, these kinds of effects would be expected from a globalscale state shift forced by present drivers, not only in human-dominated regions but also in remote regions not now heavily occupied by humans (Fig. 1); indeed, such changes are already under way (see above 5,25,39,41–44 ). Given that it takes hundreds of thousands to millions of years for evolution to build diversity back up to pre-crash levels after major extinction episodes 25 , increased rates of extinction are of particular concern, especially because global and regional diversity today is generally lower than it was 20,000 yr ago as a result of the last planetary state shift 37,50,51,54,59 . This large-scale loss of diversity is not overridden by historical increases in plant species richness in many locales, owing to human-transported species homogenizing the world’s biota 42 . Possible too are substantial losses of ecosystem services required to sustain the human population 60 . Still unknown is the extent to which human-caused increases in certain ecosystem services—such as growing food—balances the loss of ‘natural’ ecosystem services, many of which already are trending in dangerous directions as a result of overuse, pollutants and climate change 3,16 . Examples include the collapse of cod and other fisheries 45,61,62 ; loss of millions of square kilometres of conifer forests due to climate-induced bark-beetle outbreaks; 63 loss of carbon sequestration by forest clearing 60 ; and regional losses of agricultural productivity from desertification or detrimental land-use practices 1,35 . Although the ultimate effects of changing biodiversity and species compositions are still unknown, if critical thresholds of diminishing returns in ecosystem services were reached over large areas and at the same time global demands increased (as will happen if the population increases by 2,000,000,000 within about three decades), widespread social unrest, economic instability and loss of human life could result 64 .

#### The risk of keystone species loss leads to extinction – outweighs on reversibility.

Chen 2k (Jim, Professor of Law at University of Minnesota and Dean of Law School at Louisville, “Globalization and Its Losers”:, 9 Minn. J. Global Trade 157’ LexisNexis Legal)

Conscious decisions to allow the extinction of a species or the destruction of an entire ecosystem epitomize the "irreversible and irretrievable commitments of resources" that NEPA is designed to retard.312 The original Endangered Species Act gave such decisions no quarter whatsoever;313 since 1979, such decisions have rested in the hands of a solemnly convened "God Squad."314 In its permanence and gravity, natural extinction provides the baseline by which all other types of extinction should be judged. The Endangered Species Act explicitly acknowledges the "esthetic, ecological, educational, historical, recreational, and scientific value" of endangered species and the biodiversity they represent.315 Allied bodies of international law confirm this view:316 global biological diversity is part of the commonly owned heritage of all humanity and deserves full legal protec- tion.317 Rather remarkably, these broad assertions understate the value of biodiversity and the urgency of its protection. A Sand County Almanac, the eloquent bible of the modern environmental movement, contains only two demonstrable bio- logical errors. It opens with one and closes with another. We can forgive Aldo Leopold's decision to close with that elegant but erroneous epigram, "ontogeny repeats phylogeny."318 What concerns erns us is his opening gambit: "There are some who can live without wild things, and some who cannot."319 Not quite. None of us can live without wild things. Insects are so essential to life as we know it that if they "and other land-dwelling anthropods ... were to disappear, humanity probably could not last more than a few months."320 "Most of the amphibians, reptiles, birds, and mammals," along with "the bulk of the flowering plants and ... the physical structure of most forests and other terrestrial habitats" would disappear in turn.321 "The land would return to" something resembling its Cambrian condition, "covered by mats of recumbent wind-pollinated vegetation, sprinkled with clumps of small trees and bushes here and there, largely devoid of animal life."322 From this perspective, the mere thought of valuing biodiver- sity is absurd, much as any attempt to quantify all of earth's planetary amenities as some trillions of dollars per year is ab- surd. But the frustration inherent in enforcing the Convention on International Trade in Endangered Species (CITES) has shown that conservation cannot work without appeasing Homo economicus, the profit-seeking ape. Efforts to ban the interna- tional ivory trade through CITES have failed to stem the slaugh- ter of African elephants.323 The preservation of biodiversity must therefore begin with a cold, calculating inventory of its benefits. Fortunately, defending biodiversity preservation in human- ity's self-interest is an easy task. As yet unexploited species might give a hungry world a larger larder than the storehouse of twenty plant species that provide nine-tenths of humanity's cur- rent food supply.324 "Waiting in the wings are tens of thousands of unused plant species, many demonstrably superior to those in favor."325 As genetic warehouses, many plants enhance the pro- ductivity of crops already in use. In the United States alone, the lates phylogeny" means that the life history of any individual organism replays the entire evolutionary history of that organism's species. genes of wild plants have accounted for much of "the explosive growth in farm production since the 1930s."326 The contribution is worth $1 billion each year.327 Nature's pharmacy demonstrates even more dramatic gains than nature's farm.328 Aspirin and penicillin, our star analgesic and antibiotic, had humble origins in the meadowsweet plant and in cheese mold.329 Leeches, vampire bats, and pit vipers all contribute anticoagulant drugs that reduce blood pressure, pre- vent heart attacks, and facilitate skin transplants.330 Merck & Co., the multinational pharmaceutical company, is helping Costa Rica assay its rich biota.33' A single commercially viable product derived "from, say, any one species among... 12,000 plants and 300,000 insects ... could handsomely repay Merck's entire investment" of $1 million in 1991 dollars.332 Wild animals, plants, and microorganisms also provide eco- logical services.333 The Supreme Court has lauded the pes- ticidal talents of migratory birds.334 Numerous organisms process the air we breathe, the water we drink, the ground we stroll.335 Other species serve as sentries. Just as canaries warned coal miners of lethal gases, the decline or disappearance of indicator species provides advance warning against deeper environmental threats.336 Species conservation yields the great- est environmental amenity of all: ecosystem protection. Saving discrete species indirectly protects the ecosystems in which they live.337 Some larger animals may not carry great utilitarian value in themselves, but the human urge to protect these charis- matic "flagship species" helps protect their ecosystems.338 In- deed, to save any species, we must protect their ecosystems.339 Defenders of biodiversity can measure the "tangible eco- nomic value" of the pleasure derived from "visiting, photograph- ing, painting, and just looking at wildlife."340 In the United States alone, wildlife observation and feeding in 1991 generated $18.1 billion in consumer spending, $3 billion in tax revenues, and 766,000 jobs.341 Ecotourism gives tropical countries, home to most of the world's species, a valuable alternative to subsis- tence agriculture. Costa Rican rainforests preserved for ecotour- ism "have become many times more profitable per hectare than land cleared for pastures and fields," while the endangered go- rilla has turned ecotourism into "the third most important source of income in Rwanda."342 In a globalized economy where commodities can be cultivated almost anywhere, environmen- tally sensitive locales can maximize their wealth by exploiting the "boutique" uses of their natural bounty. The value of endangered species and the biodiversity they embody is "literally . . . incalculable."343 What, if anything, should the law do to preserve it? There are those that invoke the story of Noah's Ark as a moral basis for biodiversity preser- vation.344 Others regard the entire Judeo-Christian tradition, especially the biblical stories of Creation and the Flood, as the root of the West's deplorable environmental record.345 To avoid getting bogged down in an environmental exegesis of Judeo- Christian "myth and legend," we should let Charles Darwin and evolutionary biology determine the imperatives of our moment in natural "history."346 The loss of biological diversity is quite arguably the gravest problem facing humanity. If we cast the question as the contemporary phenomenon that "our descend- ants [will] most regret," the "loss of genetic and species diversity by the destruction of natural habitats" is worse than even "energy depletion, economic collapse, limited nuclear war, or con- quest by a totalitarian government."347 Natural evolution may in due course renew the earth with a diversity of species approximating that of a world unspoiled by Homo sapiens - in ten mil- lion years, perhaps a hundred million.348

#### **Scenario two is agriculture**

#### Despite CO2 fertilization, massive rise of temperature due to warming causes food shortages —the result is extinction.

Strom 7 (Robert, Professor Emeritus of planetary sciences in the Department of Planetary Sciences at the University of Arizona, studied climate change for 15 years, the former Director of the Space Imagery Center, a NASA Regional Planetary Image Facility, “Hot House”, SpringerLink, p. 211-216)

THE future consequences of global warming are the least known aspect of the problem. They are based on highly complex computer models that rely on inputs that are sometimes not well known or factors that may be completely unforeseen. Most models assume certain scenarios concerning the rise in greenhouse gases. Some assume that we continue to release them at the current rate of increase while others assume that we curtail greenhouse gas release to one degree or another. Furthermore, we are in completely unknown territory. The current greenhouse gas content of the atmosphere has not been as high in at least the past 650,000 years, and the rise in temperature has not been as rapid since civilization began some 10,000 years ago. What lies ahead for us is not completely understood, but it certainly will not be good, and it could be catastrophic. We know that relatively minor climatic events have had strong adverse effects on humanity, and some of these were mentioned in previous chapters. A recent example is the strong El Nin~o event of 1997-1998 that caused weather damage around the world totaling $100 billion: major flooding events in China, massive fires in Borneo and the Amazon jungle, and extreme drought in Mexico and Central America. That event was nothing compared to what lies in store for us in the future if we do nothing to curb global warming. We currently face the greatest threat to humanity since civilization began. This is the crucial, central question, but it is very difficult to answer (Mastrandea and Schneider, 2004). An even more important question is: "At what temperature and environmental conditions is a threshold crossed that leads to an abrupt and catastrophic climate change?'' It is not possible to answer that question now, but we must be aware that in our ignorance it could happen in the not too distant future. At least the question of a critical temperature is possible to estimate from studies in the current science literature. This has been done by the Potsdam Institute for Climate Impact Research, Germany's leading climate change research institute (Hare, 2005). According to this study, global warming impacts multiply and accelerate rapidly as the average global temperature rises. We are certainly beginning to see that now. According to the study, as the average global temperature anomaly rises to 1 °C within the next 25 years (it is already 0.6'C in the Northern Hemisphere), some specialized ecosystems become very stressed, and in some developing countries food production will begin a serious decline, water shortage problems will worsen, and there will be net losses in the gross domestic product (GDP). At least one study finds that because of the time lags between changes in radiative forcing we are in for a 1 °C increase before equilibrating even if the radiative forcing is fixed at today's level (Wetherald et al., 2001). It is apparently when the temperature anomaly reaches 2 °C that serious effects will start to come rapidly and with brute force (International Climate Change Taskforce, 2005). At the current rate of increase this is expected to happen sometime in the middle of this century. At that point there is nothing to do but try to adapt to the changes. Besides the loss of animal and plant species and the rapid exacerbation of our present problems, there are likely to be large numbers of hungry, diseased and starving people, and at least 1.5 billion people facing severe water shortages. GDP losses will be significant and the spread of diseases will be widespread (see below). We are only about 30 years away from the 440 ppm CO2 level where the eventual 2'C global average temperature is probable. When the temperature reaches 3 'C above today's level, the effects appear to become absolutely critical. At the current rate of greenhouse gas emission, that point is expected to be reached in the second half of the century. For example, it is expected that the Amazon rainforest will become irreversibly damaged leading to its collapse, and that the complete destruction of coral reefs will be widespread. As these things are already happening, this picture may be optimistic. As for humans, there will be widespread hunger and starvation with up to 5.5 billion people living in regions with large crop losses and another 3 billion people with serious water shortages. If the Amazon rainforest collapses due to severe drought it would result in decreased uptake of CO2 from the soil and vegetation of about 270 billion tons, resulting in an enormous increase in the atmospheric level of CO2. This, of course, would lead to even hotter temperatures with catastrophic results for civilization. A Regional Climate Change Index has been established that estimates the impact of global warming on various regions of the world (Giorgi, 2006). The index is based on four variables that include changes in surface temperature and precipitation in 2080-2099 compared to the period 1960-1979. All regions of the world are affected significantly, but some regions are much more vulnerable than others. The biggest impacts occur in the Mediterranean and northeastern European regions, followed by high-latitude Northern Hemisphere regions and Central America. Central America is the most affected tropical region followed by southern equatorial Africa and southeast Asia. Other prominent mid-latitude regions very vulnerable to global warming are eastern North America and central Asia. It is entirely obvious that we must start curtailing greenhouse gas emissions now, not 5 or 10 or 20 years from now. Keeping the global average temperature anomaly under 2'C will not be easy according to a recent report (Scientific Expert Group Report on Climate Change, 2007). It will require a rapid worldwide reduction in methane, and global CO2 emissions must level off to a concentration not much greater than the present amount by about 2020. Emissions would then have to decline to about a third of that level by 2100. Delaying action will only insure a grim future for our children and grandchildren. If the current generation does not drastically reduce its greenhouse gas emission, then, unfortunately, our grandchildren will get what we deserve. There are three consequences that have not been discussed in previous chapters but could have devastating impacts on humans: food production, health, and the economy. In a sense, all of these topics are interrelated, because they affect each other. Food Production Agriculture is critical to the survival of civilization. Crops feed not only us but also the domestic animals we use for food. Any disruption in food production means a disruption of the economy, government, and health. The increase in CO2 will result in some growth of crops, and rising temperatures will open new areas to crop production at higher latitudes and over longer growing seasons; however, the overall result will be decreased crop production in most parts of the world. A 1993 study of the effects of a doubling of CO2 (550 ppm) above pre-industrial levels shows that there will be substantial decreases in the world food supply (Rosenzweig et al., 1993). In their research they studied the effects of global warming on four crops (wheat, rice, protein feed, and coarse grain) using four scenarios involving various adaptations of crops to temperature change and CO2 abundance. They found that the amount of world food reduction ranged from 1 to 27%. However, the optimistic value of 1% is almost certainly much too low, because it assumed that the amount of degradation would be offset by more growth from "CO2 fertilization." We now know that this is not the case, as explained below and in Chapter 7. The most probable value is a worldwide food reduction between 16 and 27%. These scenarios are based on temperature and CO2 rises that may be too low, as discussed in Chapter 7. However, even a decrease in world food production of 16% would lead to large-scale starvation in many regions of the world. Large-scale experiments called Free-Air Concentration Enrichment have shown that the effects of higher CO2 levels on crop growth is about 50% less than experiments in enclosure studies (Long et al., 2006). This shows that the projections that conclude that rising CO2 will fully offset the losses due to higher temperatures are wrong. The downside of climate change will far outweigh the benefits of increased CO2 and longer growing seasons. One researcher (Prof. Long) from the University of Illinois put it this way: Growing crops much closer to real conditions has shown that increased levels of carbon dioxide in the atmosphere will have roughly half the beneficial effects previously hoped for in the event of climate change. In addition, ground-level ozone, which is also predicted to rise but has not been extensively studied before, has been shown to result in a loss of photosynthesis and 20 per cent reduction in crop yield. Both these results show that we need to seriously re-examine our predictions for future global food production, as they are likely to be far lower than previously estimated. Also, studies in Britain and Denmark show that only a few days of hot temperatures can severely reduce the yield of major food crops such as wheat, soy beans, rice, and groundnuts if they coincide with the flowering of these crops. This suggests that there are certain thresholds above which crops become very vulnerable to climate change. The European heat wave in the summer of 2003 provided a large-scale experiment on the behavior of crops to increased temperatures. Scientists from several European research institutes and universities found that the growth of plants during the heat wave was reduced by nearly a third (Ciais et al., 2005). In Italy, the growth of corn dropped by about 36% while oak and pine had a growth reduction of 30%. In the affected areas of the mid- west and California the summer heat wave of 2006 resulted in a 35% loss of crops, and in California a 15% decline in dairy production due to the heat-caused death of dairy cattle. It has been projected that a 2 °C rise in local temperature will result in a $92 million loss to agriculture in the Yakima Valley of Washington due to the reduction of the snow pack. A 4'C increase will result in a loss of about $163 million. For the first time, the world's grain harvests have fallen below the consumption level for the past four years according to the Earth Policy Institute (Brown, 2003). Furthermore, the shortfall in grain production increased each year, from 16 million tons in 2000 to 93 million tons in 2003. These studies were done in industrialized nations where agricultural practices are the best in the world. In developing nations the impact will be much more severe. It is here that the impact of global warming on crops and domestic animals will be most felt. In general, the world's most crucial staple food crops could fall by as much as one-third because of resistance to flowering and setting of seeds due to rising temperatures. Crop ecologists believe that many crops grown in the tropics are near, or at, their thermal limits. Already research in the Philippines has linked higher night-time temperatures to a reduction in rice yield. It is estimated that for rice, wheat, and corn, the grain yields are likely to decline by 10% for every local 1 °C increase in temperature. With a decreasing availability of food, malnutrition will become more frequent accompanied by damage to the immune system. This will result in a greater susceptibility to spreading diseases. For an extreme rise in global temperature (> 6 'C), it is likely that worldwide crop failures will lead to mass starvation, and political and economic chaos with all their ramifications for civilization.

#### Reprocessing solves warming in two ways:

#### First, reprocessing is key to a revived U.S. clean energy program that provides leadership to win agreements to cut emissions and solve warming.

Roberts 4 (Paul, Energy Expert and Writer for Harpers, The End of Oil, pg. 325-326)

Politically, a new U.S. energy policy would send a powerful message to the rest of the players in the global energy economy. Just as a carbon tax would signal the markets that a new competition had begun, so a progressive, aggressive American energy policy would give a warning to international businesses, many of which now regard the United States as a lucrative dumping ground for older high-carbon technology. It would signal energy producers — companies and states — that they would need to start making investments for a new energy business, with differing demands and product requirements. Above all, a progressive energy policy would not only show trade partners in Japan and Europe that the United States is serious about climate but would give the United States the leverage it needs to force much-needed changes in the Kyoto treaty. With a carbon program and a serious commitment to improve efficiency and develop clean-energy technologies, says one U.S. climate expert, “the United States could really shape a global climate policy. We could basically say to Europe, ‘Here is an American answer to climate that is far better than Kyoto. Here are the practical steps we’re going to take to reduce emissions, far more effectively than your cockamamie Kyoto protocol.”’ Similarly, the United States would finally have the moral credibility to win promises of cooperation from India and China. As James MacKenzie, the former White House energy analyst who now works on climate issues for the Washington-based World Resources Institute, told me, Chinese climate researchers and policymakers know precisely what China must do to begin to deal with emissions but have thus far been able to use U.S. intransigence as an excuse for their own inaction. “Whenever you bring up the question of what the Chinese should be doing about climate, they just smile. They ask, ‘Why should we in China listen to the United States and take all these steps to protect the climate, when the United States won’t take the same steps itself? With a nudge from the United States, argues Chris Flavin, the renewables optimist at World Watch Institute, China could move away from its “destiny” as a dirty coal energy economy. Indeed, given China’s urgent air quality problems, a growing middle class that will demand environmental quality, and a strategic desire to become a high- tech economy, Flavin says, Beijing is essentially already under great domestic pressure to look beyond coal and is already turning toward alternatives — gas, which is in short supply, but also renewables, especially wind, a resource China has in abundance. Once China’s growing expertise in technology and manufacturing and its cheap labor costs are factored in, Flavin says, it has the basis for a large-scale wind industry — something the right push from the West could set in motion. “As China moves forward,” asks Flavin, “is it really likely to do something that no other country has ever done: run a modern, hightech, postindustrial economy on a hundred-year-old energy source?” Flavin, for one, thinks not. During a visit two years ago to lobby reluctant Chinese government officials to invest in renewable energy, Flavin was pleasantly surprised to find in his hotel parking lot a truck owned by NEG Micon, a Danish company that is one of the world’s largest wind turbine manufacturers. Flavin was elated: “At least one leading renewable-energy company, located halfway around the world, is confident enough of its business prospects in China that it now has its own vehicles in Beijing.”

#### Second, only allowing for reprocessing allows for nuclear power to transition to a carbon free economy fast enough to avoid catastrophic warming – best modeling flows aff.

Chakravorty et al. 12 (Ujjayant (Professor and Canada Research Chair, Alberta School of Business and Department of Economics); Bertrand Magne (OECD Environment Directorate, Paris, France); Michel Moreaux (Emeritus Professor and IDEI Researcher, Toulouse School of Economics, University of Toulouse), “RESOURCE USE UNDER CLIMATE STABILIZATION: CAN NUCLEAR POWER PROVIDE CLEAN ENERGY?”, Journal of Public Economic Theory, Vol. 14, Issue 2, 2012, RSR)

This paper applies a model with price-induced substitution across resources to examine the role of nuclear power in achieving a climate stabilization target, such as that advocated by the Intergovernmental Panel on Climate Change (IPCC). It asks an important policy question: is nuclear power a viable carbon-free energy source for the future? If so, then at what cost? The main insight is that nuclear power can help us switch quickly to carbon free energy, and if historical growth rates of nuclear capacity are preserved, the costs of reaching climate stabilization goals decline signiﬁcantly and may therefore be at the lower end of cost estimates that are reported by many studies. However, it is also clear from our results that nuclear is economical anyway, even without environmental regulation. Regulation only plays a major part when fast breeders are available and that too, in the somewhat distant future, towards the end of the century. To some extent, recent increases in efﬁciency in U.S. nuclear power attest to its economic advantages, even in a market with no environmental regulation (Davis and Wolfram 2011). The climate goal of 550 ppm of carbon can be achieved at a surplus cost of about 800 billion dollars, or about 1.3% of current world GDP, if no nuclear expansion is undertaken. Achieving this goal using nuclear power will result in a tripling of the share of world nuclear electricity generation by mid century with welfare gains of about half a trillion dollars (in discounted terms). The cost of providing energy will decrease by about $1.3 trillion or 2% of current world GDP, compared to the case in which the level of nuclear generation is frozen. These estimates of cost savings from nuclear power are signiﬁcant, and unlike in previous studies, are derived from an economic model with an explicit nuclear fuel cycle. However, nuclear power can be cost-effective for about 50 years or so, beyond which period, other technologies are likely to take over, including renewables, clean coal and next generation nuclear technologies that are much more efﬁcient in recycling waste materials. Ultimately, large-scale adoption of nuclear power will be hindered by the rising cost of uranium and the problem of waste disposal. Only signiﬁcant new developments such as the availability of new generation nuclear technology that is able to recycle nuclear waste may lead to a steady state where nuclear energy plays an important role. 31

#### This is especially true now – we need nuclear power in the interim since renewables are not progressing fast enough.

Harvey 12 (Fiona, Environment Correspondent, “Nuclear power is only solution to climate change, says Jeffrey Sachs”, The Guardian, 5-3-12,

<http://www.guardian.co.uk/environment/2012/may/03/nuclear-power-solution-climate-change>, RSR)

Combating climate change will require an expansion of nuclear power, respected economist Jeffrey Sachs said on Thursday, in remarks that are likely to dismay some sections of the environmental movement. Prof Sachs said atomic energy was needed because it provided a low-carbon source of power, while renewable energy was not making up enough of the world's energy mix and new technologies such as carbon capture and storage were not progressing fast enough. "We won't meet the carbon targets if nuclear is taken off the table," he said. He said coal was likely to continue to be cheaper than renewables and other low-carbon forms of energy, unless the effects of the climate were taken into account.

#### US leadership on nuclear reprocessing leads to a spillover of the technology internationally.

Acton 9 (James, J. associate in the Nonproliferation Program at the Carnegie Endowment for International Peace, Survival, Vol. 51, No. 4, “Nuclear Power, Disarmament and Technological Restraint”, RSR)

Thus, not only does reprocessing clearly not help with facilitating take back, but if advanced nuclear states adopt it as a tool for waste management, it will be virtually impossible for them to argue against others doing likewise. Today, waste management is probably the most important driver for reprocessing. Indeed, the Bush administration’s interest in this technology was born out of a desire to stretch the capacity of Yucca Mountain as far as possible. If the United States and others reprocess they will hand a powerful argument to lobbies within a state – typically the nuclear R&D community – that support the development of reprocessing.

### Plan Text

#### Thus the plan: The United States Federal Government should provide a twenty-percent investment tax credit for the deployment of domestic nuclear fuel recycling.

### Solvency

#### Observation Four: Solvency

#### Tax incentives would solve for reprocessing – makes it commercially more desirable

Lagus 5 (Todd, 2005 WISE Intern, University of Minnesota, WISE, “Reprocessing of Spent Nuclear Fuel: A Policy Analysis” <http://www.wise-intern.org/journal/2005/lagus.pdf>, RSR)

The economic analysis shows that the reprocessing or even the once through nuclear cycle is not yet economically desirable to investors. However, changes in government policies, including environmental regulations already mentioned and economic policies, could improve the competitiveness of both technologies. The University of Chicago nuclear power study analyzes the effects of government involvement in the future of the once through cycle using several different forms of support: loan guarantees, accelerated depreciation, and investment tax credits. Loan guarantees in this case refer to the obligation of the government to repay part of the loan should a utility company not be able to repay. The 2005 Energy Bill, which passed in July 2005, would make advanced nuclear power plants eligible for federal loan guarantees and provide a tax credit for nuclear power production. This would lessen the risks associated with capital costs for investors, and according to the Chicago study, reduce the LCOE for a nuclear reactor by 4 mills/kWh to 6 mills/kWh. The next financial subject, accelerated depreciation, refers to the ability of an investor to utilize the investment tax deductions early on in the lifetime of the payment rather than receive the same deduction each year in a linear fashion. Accelerated depreciation helps investors absorb capital costs, which for nuclear power generation are large. The University of Chicago study calculates a reduction in the LCOE for a 7 year depreciation policy of 3 mills/kWh to 4 mills/kWh. Tax incentives for nuclear power production are the final policies that could make nuclear power and reprocessing more desirable. An investment tax credit of 10 percent would create an LCOE reduction between 6 mills/kWh and 8 mills/kWh, while a 20 percent credit could create cost reductions between 9 mills/kWh and 13 mills/kWh. 39 Production tax credits on a per kWh basis may also be used. Since reprocessing and the once through cycle are not appreciably different for the price, it is sufficient to assume 12 that similar effects for all three of these government policies would occur with policies applied to reprocessing. While it is no secret that monetary incentives would help the nuclear reprocessing investments, there is still the question of whether or not the government should provide economic support to the industry. As with any government funding, it is politically important not to be viewed by other energy generation industries, i.e. gas and coal, as favoring nuclear power over other sources. Given the recent concerns for global warming, tax incentives and loan guarantees for nuclear technologies seem like a realistic option especially in the absence of emission regulations. Accelerated depreciation also is an unobtrusive option that could help the industry by easing capital costs.

#### Government investment key – necessary to mitigate risks from government regulations.

Selyukh 10 (Alina, Staff Writer, “Nuclear waste issue could be solved, if...”, 8-17-10, Reuters,

<http://www.reuters.com/article/2010/08/17/us-nuclear-waste-recycling-idUSTRE67G0NM20100817>, RSR)

Since the U.S. agency declared spent fuel reprocessing too costly, U.S. research into new technologies has slowed. President George W. Bush offered federal backing for nuclear waste management alternatives, but over the years the policy has meandered and had few incentives to lure companies, said Steven Kraft, senior director of used-fuel management at the Nuclear Energy Institute, the industry's trade organization. Being able to burn through rather inexpensive uranium to produce energy, companies are wary of investing millions into recycling technology that may go against the national policy. Still, industry support for the ideas is strong, if not for the procedure itself then for allowing the market -- not the government -- to determine its cost-effectiveness and fate. Duke Energy, which operates seven nuclear plants, would support nuclear recycling if there was a cost-effective national policy, spokeswoman Rita Sipe said. GE Hitachi has proposed a new generation of fast reactors that, they say, could return to the grid up to 99 percent of energy contained in the uranium, compared to recovering 2 or 3 percent from a common light water reactor. But they want federal support for more research and, ultimately, commercialization of the technology, said chief consulting engineer Erik Loewen. That support, in essence, would have to come in a form of subsidies such as cost sharing or loan guarantees, said Jack Spencer, nuclear energy policy research fellow at the Heritage Foundation think tank. "What the industry needs... is something to mitigate government-imposed risks," he said of the regulatory regime.

#### Government investment necessary – provides appropriate risk mitigation and shortens the timeframe for completion.

IAEA 8 (International Atomic Energy Agency, “Spent Fuel Reprocessing Options”, August 2008, RSR)

With the expected high costs and significant risks involved in constructing new nuclear facilities, e.g., reprocessing facilities, the impact of various ownership options need to be considered. These options include government funding, regulated funding, private funding, and combinations of public and private funding. These different funding approaches may significantly impact the costs of fuel cycle services. Given the very long time frames associated with building reprocessing facilities, there exist risks other than technological or economic, which need to be dealt with. These include evolving government policy, public and political acceptance, and licensing risks. As a result, private investors are unlikely to provide capital unless the initial high risks factors are mitigated through appropriate risk sharing agreements (e.g., loan guarantees, equity protection plans, tax credits, etc.) with government entities.

## 2AC

### ASPEC

#### We meet – We use all three branches.

#### Limits – There are over 1000 agents in the USFG. Spec explodes the topic.

#### Ground – Non-spec provides them with links to all of the branches and prevents aff spiking – key to predictable ground

#### They justify Agent PICs which are bad

#### Steals all aff ground – 99% of the counterplan is the 1AC

#### Destroys offense – any offense we read links to the plan as well

#### Unpredictable – infinite number of things to PIC out of

#### Voter for fairness.

#### Aspec is not a voter

#### A. No abuse, don't vote on potential abuse. They read \_\_\_\_ other off cases meaning that there is actually no abuse.

#### B. Competing interpretations bad – arbitrary race to the bottom

### Warming

#### Status quo warming is melting arctic sea ice and releasing methane, causing positive feedback loops.

Wadhams, Professor of Ocean Physics, and Head of the Polar Ocean Physics Group in the Department of Applied Mathematics and Theoretical Physics, University of Cambridge, ‘12

[Peter, “Arctic Ice Cover, Ice Thickness and Tipping Points”, 1-19-12, Royal Swedish Academy of Sciences, AMBIO, RSR]

The present thinning and retreat of Arctic sea ice is one of the most serious geophysical consequences of global warming and is causing a major change to the face of our planet. A challenging characteristic of the behaviour is that both the rate of retreat (especially in summer) and the rate of thinning in all seasons have greatly exceeded the predictions of most models. Although sea ice in the Arctic Ocean has been in slow retreat since the 1950s at a rate of 2.8–4.3% per decade (ACIA 2005) as measured from microwave satellites (Parkinson et al. 1999), the annual-averaged rate speeded up to 10.7% per decade from 1996 onwards (Comiso et al. 2008), whilst the summer extent has shrunk even faster. In September 2007 the area reached 4.1 million km 2 , a record low (NSIDC 2007; Stroeve et al. 2007) and more than 1 million km 2 less than in the previous record year of 2005 (Stroeve et al. 2005). Although the area stabilized in 2008–2010 the continuing decline in multi-year (MY) ice fraction suggests that the total Arctic ice volume in late summer has continued to decrease, and indeed an accelerating decrease has been suggested in ﬁgures published using the PIOMAS model (Polar Science Center, Univ. Washington, personal commun., 2011). New model predictions, tuned to match these recent changes, predict disappearance of the summer sea ice within 20–30 years (Wang and Overland 2009). At the same time, submarine sonar measurements have shown that the ice has been thinning much more rapidly, by some 43% in the 25 years between the early 1970s and late 1990s (Rothrock et al. 1999, 2003; Wadhams and Davis 2000, 2001; Yu et al. 2004; Kwok et al. 2009). The thinning rate implies that at some critical date the annual cycle of thickness will have a summer minimum at which a substantial fraction of the winter ice cover will disappear, with the thinner component (mainly undeformed ﬁrst-year ice) melting completely. We may be already reaching this situation, since in the Beaufort Sea the measured summer bottom melt of a MY ﬂoe in 2007 was 2 m (Perovich et al. 2008) whilst the winter thickness achieved by ﬁrst-year (FY) ice was only 1.6 m. This may be a special case of ﬂoes drifting into a previously warmed region, but the trend is clear: decreased winter growth and increased summer melt leads to a decreased area at the end of summer, which itself offers a positive feedback through increased radiation absorption by the open water. Figure 1 shows the ice cover on September 16 2007, with a huge area of open water extending northward from the Beaufort and Chukchi Seas, exposing the ocean there to the atmosphere for the ﬁrst time since records began. The ﬁgure also shows the March 2007 track of HMS Tireless, which carried out a multibeam sonar survey of the ice underside, described later in this article. Already we are seeing consequences from these changes. The new large area of open water warms up to 4–5C during summer, which not only delays the onset of autumn freezing but also warms the seabed over the shelf areas, helping to melt offshore permafrost. One consequence of this melt is the release and decomposition of trapped methane hydrates, causing methane plumes which have global warming potential. Already such plumes have been directly observed in the East Siberian Sea (Shakhova et al. 2010) and off Svalbard, and the curve of global atmospheric methane content has undergone a (small) upward blip after being stable for some years. Molecule for molecule, methane is 23 times as potent as CO2 as a greenhouse gas, and there have been warnings that a major methane outbreak may be imminent, with release from offshore permafrost melt being joined by releases from the active layer under the tundra, which has grown thicker as the air temperature has warmed. A further consequence is that the large area of open water in summer allows a wind fetch sufﬁcient to create substantial wave energy input to the ice edge, which causes wave-induced ice break-up into ﬂoes so as to create a classic marginal ice zone (MIZ). Hitherto the MIZ structure has been considered as applying mainly to the Greenland Sea, Barents Sea, Bering Sea and Antarctic, with the Beaufort-Chukchi region facing only a narrow slot of open water. A Beaufort-Chukchi MIZ is a new situation which may also feature a positive feedback mechanism, because the fragmentation of the ice cover into wave-driven ﬂoes creates much new open water and a large ﬂoe perimeter for enhanced melt rates. A challenging characteristic of the summer sea ice extent is that its decay has exceeded the predictions of models. The observed extent began to deviate from the ensemble mean of models used by Intergovernmental Panel on Climate Change (IPCC) in the 1970s and by the 1990s it was more than one standard deviation less than the mean (Fig. 2). The 2007 extent was less than the most extreme member of the ensemble. These results strongly suggest that existing climate models are inadequate in predicting Arctic sea ice extent and that some important physics is missing. Our understanding of the processes governing these accelerating changes needs to be based on adequate measurements of ice thickness and extent throughout the year, particularly in the winter months preceding each summer’s retreat. Satellites can track ice area, but ice thickness distribution can be most accurately measured by sonar from underneath the ice. This task has been carried out since 1958 by submarines of the US and British navies, with the most recent UK datasets being in 2004 and 2007 (Wadhams et al. 2011). Since the ﬁrst UK voyage in 1971, scientiﬁc data gathering and analysis from UK submarines has been done by the author, who has sailed on many of the voyages himself. The ﬁrst evidence of Arctic ice thinning, amounting to 15% up to 1987, was published by the author in 1990 (Wadhams 1990), whilst incorporation of more recent UK and US data has shown an enormous 43% decline in thickness from the 1970s to the late 1990s.

#### Methane release is the biggest extinction risk – most probable and empirical event.

Dorritie 7 (Dan Dorritie, paleontologist, studies mass extinction events, M.A. Geology, University of California—Davis, “Preface,” Killer in our Midst, 2007, <http://www.killerinourmidst.com/>)

Deep beneath the surface of the sea, buried in the oxygen-depleted muds that have accumulated over the ages on the underwater margins of the continents, lies a vast store of natural gas that probably well exceeds, in its carbon equivalence, the entire supply of all other oil, gas, and coal on the planet. Most of this immense store of natural gas, largely comprised of methane, lies trapped in icy cages called hydrates. Below these hydrates is a huge quantity of methane as free gas bubbles, blocked from release by the hydrate, and temperature and pressure conditions above. Still more methane, as hydrate, is found in the permanently frozen (permafrost) regions that surround the poles. Methane is a much more powerful greenhouse gas than carbon dioxide, the gas which is currently warming our globe, even though methane remains in the atmosphere for a much shorter time. If released abruptly, seafloor methane has the potential to deliver a stunning jolt of heat to the planet's already increasing temperatures. Even if released more gradually, seafloor methane will inevitably compound the problem of global warming. But abruptly or gradually, as we warm the planet by our dumping of carbon dioxide into the atmosphere, the seafloor will also warm, and its methane will inevitably be released. This book is about the release of that methane, and, in particular, about the possibility of methane catastrophe. Methane catastrophes have occurred several times in Earth's history, and when they have occurred, they have sometimes caused abrupt changes in the history of life, and at least one significant extinction. That extinction, at the end of the Permian Period 250 million years ago, is the greatest in the history of life. More than 90% of the then-existing species perished, and the course of life on Earth was altered forever. If a methane catastrophe were to happen in the near future, it is likely that not only would a considerable percentage of existing plants and animals be killed off, but a large percentage of the human population as well, as a result of the climate change and significantly more hostile environmental conditions. Yet we may well be heading toward such a catastrophe, produced by our warming of the planet. Just how rapidly seafloor methane will be released depends on numerous factors that are quite difficult to assess. It is possible that seafloor methane will be released so slowly that it will only have a relatively minor warming effect on Earth's climate. On the other hand, because the coming methane release will be the result of our warming of the planet via the burning of fossil and other acrbon fuels, it could happen much more quickly. Indeed, it seems that we are currently pumping the greenhouse gas carbon dioxide into the atmosphere at a much faster -- perhaps tens to hundreds of times faster -- rate than has ever before naturally occurred in the last half billion years or so of the Earth's history. The catastrophic warming we are causing is -- to the best of our knowledge -- unprecedented since the early days of our planet, billions of years ago. Such warming could well lead to methane catastrophe. The onset of a methane catastrophe would be abrupt because it could be initiated by a major submarine landslide, which can happen in a matter of days or even hours, or by the venting of vast quantities of seafloor methane over a period of decades. These events can take place in what is essentially a geological eyeblink. Additional slumping and/or venting can continue for centuries to millennia. The amount of methane that can be released is indeed massive. Estimates of the amount of seafloor methane generally range from about 5000 billion metric tons to around 20,000 billion metric tons (a metric ton is equal to 1.1 imperial tons, the standard ton used in the United States), though they usually range around 10,000 billion metric tons. This amount of methane contains about 7500 billion metric tons of carbon, vastly more than all the estimated carbon in all fossil fuels: petroleum, coal, and natural gas. There is a simple way to put 10,000 billion metric tons of methane into perspective: it contains about ten times the amount of carbon (largely in the form of carbon dioxide) as does the entire atmosphere. Moreover, though methane entering the atmosphere is quickly oxidized, it is oxidized to carbon dioxide, so the problem of its warming ability will remain with us for thousands of years into the future. A methane catastrophe, therefore, is an abrupt surge of greenhouse gas that could rival or exceed the carbon dioxide warming of the planet. It could potentially overwhelm the natural heat regulatory system of the Earth, which operates in a much more gradual way, and on a much more protracted time scale. The quantity of methane that could be released is so massive there would be no remedial action that people would be able to take to mitigate it except in the most superficial way. Once a methane catastrophe were to begin, there would be major consequences for the planet and its inhabitants, human and other, and we would be able to do little except wait it out. Methane, in a very real sense, is the joker in the deck of global warming. As with the current increase in atmospheric carbon dioxide, a large methane release will undoubtedly contribute to an increase in acid rain, and, through its impact on global warming, a further rise of sea level, increased desertification, increased heavy precipitation, and extreme weather events. The slowing of ocean circulation or its actual stagnation because of greater planetary warmth are also possibilities. Such a slowing would paradoxically produce a decreased transport of warm water to the coasts of northeastern North America and northernmost Europe, making for much colder winters. In addition, the destabilization of methane within seafloor sediments can send 20 meter (60 foot) high tsunamis crashing into nearby coastlines. A methane catastrophe can have other major consequences in addition to sudden global warming. It can accelerate the slow but deadly acidification of the surface ocean (down to about 100 meters, or about 300 feet), which is now occurring as a result of the increase of carbon dioxide in the atmosphere and ocean. The methane can combine with dissolved oceanic oxygen, depleting the deeper part of the ocean (that is, the ocean below about 100 meters) of oxygen, and killing off the oxygen-using (aerobic) organisms at those depths. As acidification penetrates the deep ocean, even organisms that do not use oxygen (anaerobes) will be affected. Then there are the worst case scenarios. With the warming of the world ocean, its chemical balance and biological composition will change. The ocean will become stratified, with mixing between its surface and the deep ocean becoming increasingly restricted. If the deep ocean becomes fully anoxic (devoid of oxygen), it will also become toxic, as the remaining anaerobic organisms pump out the deadly gas hydrogen sulfide. In sufficient quantities, that gas could escape oceanic confinement to poison the atmosphere and, combining with the iron in the blood's hemoglobin, kill terrestrial organisms, including us. But the composition of the atmosphere could also change in a second way, because the amount of free oxygen depends on two things: the actual production of oxygen (by the ocean's photosynthetic plankton and terrestrial green plants) and the delivery of large amounts of carbon (as part of a "rain" of organic debris from organisms closer to the surface) to the ocean's bottom. This carbon, if not removed from the global carbon cycle by sinking and eventual burial in the ocean floor, will combine with oxygen and lower its concentration in the atmosphere. Once oceanic anoxia kills off aerobic marine organisms (those which require oxygen to live), the natural regulatory system for carbon will be sent into a tailspin. The amount of organic debris produced in surface waters will likely be reduced, the amount that rapidly descends to the ocean floor will be reduced, and the proportion that gets decomposed on the way to the bottom will be significantly reduced. Exactly how this will play out is unclear, because certain of these changes will operate to slow the removal of carbon from the global carbon cycle (which will act to decrease the amount of oxygen in the atmosphere), while others will enhance it (increasing atmospheric oxygen). When a similar disruption of the marine ecosystem occurred at the end of the Permian, a quarter of a billion years ago, atmospheric oxygen dropped to a fraction (about 2/5ths) of its previous level. But increased oxygen could be just as bad: oxygen ions (sometimes referred to as free radicals) can inflict genetic damage to DNA, causing mutations and cancer. We are certainly on the verge of releasing a huge amount of permafrost and seafloor methane within a very short time; we may also be on the brink of methane catastrophe. By our own actions -- by our continuing and increasing use of carbon fuels -- we are slowly but inexorably creating the conditions during which a such a methane release, catastrophic or more gradual, could occur. We probably have time to prevent a catastrophe, but there is a certain non-negligible possibility that we have already crossed -- or will shortly cross -- an invisible threshold that will render a methane catastrophe inevitable and unstoppable. Major anthropogenic global warming by carbon dioxide and possible methane catastrophe will be events more cataclysmic than any that can befall Earth, except for an impact with a giant asteroid or comet, or a stellar explosion in our neighborhood of the Milky Way. These other events, however, are quite rare and unlikely in our immediate future. Major anthropogenic global warming by carbon dioxide and possible methane catastrophe, by contrast, are highly likely and much more immediate. More importantly, unlike those other possible cataclysms, both are preventable -- probably -- if we take them seriously, begin to understand them, and -- most difficult of all -- begin to take steps to avert them. It has become fashionable to dismiss predictions of catastrophe, partly because they have become so common. Many of us have become jaded, what with one such prediction after another. We used to hear a good deal about nuclear holocaust, or nuclear winter, but as those threats seem to have faded in the public consciousness, there are others which have replaced it. We now hear of doomsday asteroids, the ozone hole, SARS (severe acute respiratory syndrome), bird flu, global warming, and the obliteration of species. The number of threats seems to be increasing. And, actually, that number is increasing. Prior to this epoch in human history, people simply did not have the ability to impact our planet in potentially catastrophic ways. Unfortunately, we now do have that ability. The ozone hole is a simple example. Never before was humanity on the verge of destroying this gaseous umbrella which protects us (and all other organisms that live at or near the surface of the Earth) from deadly ultraviolet light. Humanity simply didn't have that kind of power. But the advent of chloro-flouro-carbon (CFC) refrigerants gave us that ability, and the ozone layer sustained significant damage before the problem began to be addressed. Luckily, this is a problem for which there is a ready solution, and by banning the production of these ozone-harming chemicals, we have begun to bring the problem under control. The problem of carbon dioxide emissions, consequent global warming, and the prospect of a major seafloor methane release, however, will not be addressed so easily. We currently have no technology to trap and hold large quantities of carbon dioxide, and we are not likely to have such a technology for many decades in the future -- if indeed we ever will. Some of the excess carbon dioxide we produce is in fact currently slipping beyond our potential grasp, entering the oceans at the astounding rate of about a million metric tons (a metric ton = 1.1 standard ton) per hour, and increasing the acidity of seawater. There is, in addition, great resistance in a world economy driven and dominated by fossil fuels to shifting the energy base of that economy. Enormous corporate profits and personal fortunes, and the success of political efforts on their behalf, are also at stake. Slowing the stampede to catastrophically higher global temperatures and ocean destruction will require substantial international effort. Even so, should we today stop spewing carbon dioxide into the atmosphere, global temperatures will continue to increase for some time into the future. Despite our aversion to warnings of imminent catastrophe, our problem may be that we are not alarmed enough. Because of the delayed consequences of our dumping carbon dioxide into the atmosphere, the major effects of global warming will only be starting just as the world supply of oil is well on its way to depletion (about 2050). But already startling environmental changes -- the early, "minor" effects of global warming -- are occurring on Earth: ·With the exception of 1996, the years from 1995 to 2004 constitute 9 of the 10 warmest years since systematic record keeping began in 1861. ·The year 2005 was the warmest year since records have been kept. The next warmest years, in order, are, 1998, 2002, 2003, and 2004. ·Globally, glaciers have retreated, on average, almost some 15% since 1850. Glacial retreat has been recorded in Tibet, Alaska, Peru, the Alps, Kenya, Antarctica. ·Alaskan temperatures have risen about 2.8°C (5°F) in the past few decades. ·In the past several decades, about 40% of Arctic Ocean sea ice has disappeared. (Some researchers now believe, however, that at least part of this sea ice loss may be due to changing wind patterns over the North Pole, but these wind changes, themselves, may be due to a warming climate.) ·Between 1965 and 1995, the amount of melt water from the Arctic region going into the North Atlantic was about 20,000 cubic kilometers (about 4800 cubic miles), the equivalent of the fresh water in all of the Great Lakes combined (Superior, Huron, Erie, and Ontario) with the exception of Lake Michigan. Preliminary calculations indicate that an additional 18,000 cubic kilometers (4300 cubic miles) or so could shut down ocean circulation in the North Atlantic. That shutdown could occur in two decades or less, though most scientists believe it will take much longer. The Intergovernmental Panel on Climate Change, comprised of thousands of climate scientists worldwide, puts the likely slowing at about 25% by 2100. ·Trade winds across the equatorial Pacific have slowed because of higher humidity, and are projected to do so even more as time passes. The increase in humidity is the result of increased evaporation, traceable to global warming. This slowing of Pacific winds will also slow the ocean surface currents that the winds push along. Some scientists fear that at some point "the switch will be tripped" and nutrient-rich bottom water will no longer rise to the surface in the eastern Pacific (a "permanent El Niño" situation which did exist about three million years ago). These waters feed the plankton which feed the anchovies in one of the world's greatest fisheries. Much of the anchovy harvest is dried, ground up, and added to chicken feed, of which it is a major protein constituent. If the switch does trip, good-bye to inexpensive chicken. ·Upper ocean temperatures have risen between 0.5 and 1.0°C (0.9 to 1.8°F) since 1960. Deeper water has also warmed, but not by as much. The total amount of energy that has gone into the oceans as a consequence of global warming, however, is staggering: enough to run the state of California for 200,000 years. ·In addition to significant retreats of the glaciers on Greenland's margins, as of 2005 Greenland's massive ice sheet is melting at more than twice the rate it was in the previous three years. Glaciologists report that portions of the sheet which were solid ice just a few years ago are now riddled with meltwater caverns. ·The deep waters of the Southern Ocean (that which encircles Antarctica) have become significantly colder and less salty than they were just ten years ago. This is presumably due to the melting of Southern Ocean sea ice and parts of the Antarctic ice cap. Deep ocean waters have been previously presumed to be fairly isolated from climate warming but the data obtained from depths of four to five kilometers (more than two to three miles) now suggests otherwise. Such changes could significantly impact global ocean circulation. ·The Southern Ocean, which may absorb more carbon dioxide than any other region of the global ocean, as of more than twenty-five years ago ceased to absorb additional carbon dioxide. In fact, its ability to absorb carbon dioxide seems to be declining -- even as atmospheric levels of that gas are reaching ever higher levels -- most likely due to increased wind speed over that part of the global ocean. The higher wind speed in turn has been attributed to both global warming and the destruction of the Antarctic ozone layer. Because oceans eventually absorb most of the carbon dioxide that goes into the atmosphere, the declining ability of the Southern Ocean to absorb carbon dioxide is a particularly ominous development. ·Huge expanses of floating ice around Antarctica have collapsed into fragments in just weeks, after existing for tens of thousands of years. In addition, the ice that currently covers West Antarctica, known as the West Antarctic Ice Sheet (WAIS), which was quite recently (as of 2001) judged by the UN's Intergovernmental Panel on Climate Change (IPCC) as unlikely to collapse before the end of this century, or even for the next millennium, may now be starting to disintegrate, according to the head of the British Antarctic Survey. If this ice sheet does collapse, global sea level will rise by about 5 meters (16 feet). ·While global daytime temperatures, on average, increased only about 0.33°C (0.6°F) between 1979 and 2003, nighttime temperatures have risen more than 1°C (1.8°F). These environmental changes have had significant biological effects: ·In the eastern North Atlantic, warm-water phytoplankton (marine organisms that photosynthesize, produce oxygen, and constitute the bottom of the food chain) has moved north 1000 km (600 miles) over the past 40 years. ·In 2004, almost a quarter of a million breeding pairs of seabirds in islands north of Scotland failed to produce more than a few dozen offspring. Their reproductive failure is most likely due to the North Atlantic phytoplankton changes, and the consequent breakdown of the marine food chain. Many of the affected birds migrate back and forth between the Scottish islands and areas around the Southern Ocean (off Antarctica) over the course of the year. Starved in the north, they will never make it back to the south. Similar changes have been observed off the West Coast of the United States in 2005. ·Krill, small (about 5 cm/2 inches in length), shrimplike creatures which are a main food source for seals, whales, and penguins in the Southern Ocean, have declined in places to just 20% of their previous number in just 30 years. ·Grass now survives the winter in places on the Antarctic Peninsula, the warmest part of that frigid continent. When grass last was able to survive Antarctic winters is unknown. ·In the 17 year period from 1987 to 2003, the number and size of major wildfires in the western U. S. has increased dramatically. Compared to the 17 year period stretching from 1970 to 1986, the number of major wildfires has increased fourfold, and the area burned by major fires has increased sixfold. All of the presumed causes for this increase -- the earlier melting of snow, increased summer temperatures, an extended fire season, and an increase in the area of high-altitude forests which is vulnerable to such fires -- can be traced to global warming. ·The small increase in global nighttime temperatures indicated above (1°C/1.8°F), is sufficient to have reduced the biomass (the total mass of roots, stems, leaves, and grain) of rice, humankind's most important crop, by 10%. Rice is the primary foodstuff for more than half of the population of the world. With the warming, the release of methane has begun to follow: ·The Western Siberian Peat Bog, comprising an area of a million square kilometers (about 385,000 square miles, roughly the combined size of France and Germany), has begun to melt. This area is underlain by permafrost (permanently frozen ground that has existed since the Ice Age) perhaps a kilometer (about 3000 feet) deep. The permafrost contains an enormous amount of methane hydrate, possibly as much as a quarter of the total inventory of continental methane. As this permafrost warms and melts -- an irreversible process -- methane is released. This melting may add a quantity of methane to the atmosphere roughly equivalent to that released by all other natural and agricultural sources, increasing global warming by 10 to 25%. ·Already, methane emissions from certain areas of Siberian permafrost is proceeding much more rapidly than previously estimated. These extensive areas, characterized by Ice Age deposits of wind-blown dust (called loess) with high carbon and very high ice (50 to 90%) contents, are bubbling out methane at a rate five times higher than earlier presumed. Overall, these "yedoma" regions are contributing an additional 10 to 63% the total rate of methane release from the wetlands of the north. These are only the early effects, ripples from the storm which is to come. Remedial action is still possible, but the likelihood of catastrophe becomes more certain with each passing year.

#### They say ice age - best studies conclude no natural ice age coming for 10,000 years

Revkin 8 (Andrew C. Revkenm, Environment reporter, 2008, “Skeptics on human climate impact seize on cold spell, NEW YORK TIMES, Lexis)

Despite the recent trend toward global warming, scientists have long wondered whether the Earth is nearing a new ice age, an end to the 12,000-year temperate spell in which civilizations arose. Some have said such a transition is overdue, given that each of the three temperate intervals that immediately preceded this current one lasted only about 10,000 years. But now, in an eagerly awaited study, a group of climate and ice experts say they have new evidence that Earth is not even halfway through the current warm era. The evidence comes from the oldest layers of Antarctic ice ever sampled. Some scientists earlier proposed similar hypotheses, basing them on the configuration of Earth's orbit, which seems to set the metronome that ice ages dance to. Temperature patterns deciphered in sea sediments in recent years backed the theory. But experts say the new ice data are by far the strongest corroborating evidence, revealing many similarities between today's atmospheric and temperature patterns and those of a warm interval, with a duration of 28,000 years, that reached its peak 430,000 years ago. The findings are described Thursday in the journal Nature in a report by the European Project for Ice Coring in Antarctica. The evidence comes from a shaft of ice extracted over five grueling years from Antarctica's deep-frozen innards, composed of thousands of ice layers formed as each year's snowfall was compressed over time. The deepest ice retrieved so far comes from 10,000 feet deep and dates back 740,000 years. The relative abundance of certain forms of hydrogen in the ice reflects past air temperatures. Many ice cores have been cut from various glaciers and ice sheets around the world, but until now none have gone back beyond 420,000 years. "It's very exciting to see ice that fell as snow three-quarters of a million years ago," said Dr. Eric Wolff, an author of the paper and ice core expert with the British Antarctic Survey.

#### Err Aff – if CO2 is actually necessary to prevent ice age – we can use tech to easily produce it.

Hansen, head of NASA Goddard Institute and professor of Environmental Sciences, Columbia University , ‘7

[James, 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 as a private citizen to the Select Committee on Energy Independence and Global Warming, United States House of Representatives, revised 25 June 2007]

Thus the natural tendency today, absent humans, would be toward the next ice age, albeit the tendency would not be very strong because the eccentricity of the Earth’s orbit is rather small (0.017). However, another ice age will never occur, unless humans go extinct. Although orbital changes are the ‘pacemaker’ of the ice ages, the two mechanisms by which the Earth becomes colder in an ice age are reduction of the long-lived GHGs and increase of ice sheet area. But these natural mechanisms are now overwhelmed by human-made emissions, so GHGs are skyrocketing and ice is melting all over the planet. Humans are now in control of global climate, for better or worse. An ice age will never be allowed to occur if humans exist, because it can be prevented by even a ‘thimbleful’ of CFCs (chlorofluorocarbons), which are easily produced.

#### No offense – enough CO2 to offset ice age now, adding more is catastrophic.

AFP 2008[“CO2 may prevent next Ice Age: study”, http://www.abc.net.au/science/articles/2008/11/13/2418491.htm]

Scheduled shifts in the earth's orbit should plunge the planet into a deep freeze thousands of years from now, but current changes to our atmosphere may stop it from occurring, say scientists. Professor Thomas Crowley of the University of Edinburgh, and Dr William Hyde of the University of Toronto report in the journal Nature that the current level of carbon dioxide (CO2) in our atmosphere could negate the onset of the next Ice Age, which could occur 10,000 years from now. But they caution that their finding is not an argument in favour of global warming, which is driving imminent and potentially far-reaching damage to the climate system. Earth has experienced long periods of extreme cold over the billions of years of its history. The big freezes are interspersed with "interglacial" periods of relative warmth, of the kind we have experienced since the end of the last Ice Age, around 11,000 years ago. These climate swings have natural causes, believed to be due to changes in the earth's orbit and axis that, while minute, have a powerful effect on how much solar heat falls on the planet. Abrupt changes The researchers built a computer model to take a closer look at these phases of cooling and warmth. In addition to the planetary shifts, they also factored in levels of CO2, found in tiny bubbles in ice cores, which provide an indicator of temperature spanning hundreds of thousands of years. They found dramatic swings in climate, including changes when the earth flipped from one state to the other, which occur in a relatively short time, says Crowley. These shifts, called "bifurcations," appear to happen in abrupt series, which is counter-intuitive to the idea that the planet cools or warms gradually. "You had a big change about a million years ago, then a second change around 650,000 years ago, when you had bigger glaciations, then 450,000 years ago, when you started to get more repeated glaciations," says Thomas. "What's also interesting is that the inter-glaciations also became warmer." According to the model the next "bifurcation" would normally be due between 10,000 and 100,000 years from now. The chill would induce a long, stable period of glaciation in the mid-latitudes, smothering Europe, Asia and parts of North America with a thick sheet of ice. But Crowley says there is now enough CO2 in the air, as a result of fossil-fuel burning and deforestation, to offset any future cooling impacts due to orbital shift, says Crowley. "Even the level that we have there now is more than sufficient to reach that critical state seen in the model," he said. "If we cut back [on CO2] some, that would probably still be enough." In September, a scientific research consortium called the Global Carbon Project (GCP) said that atmospheric concentrations of CO2 reached 383 parts per million (ppm) in 2007, or 37% above pre-industrial levels. Present concentrations are "the highest during the last 650,000 years and probably during the last 20 million years," the report says. No green light Crowley cautions those who would seize on the new study to say "carbon dioxide is now good, it prevents us from walking the plank into this deep glaciation." "We don't want to give people that impression," he says. "You can't use this argument to justify [human-induced] global warming." Last year, the UN's Intergovernmental Panel on Climate Change (IPCC) said that greenhouse-gas emissions were already inflicting visible changes to the climate system, especially on ice and snow. Left unchecked, climate change could inflict widespread drought and flooding by the end of the century, translating into hunger, homelessness and other stresses for millions of people.

### Deterrence

#### Reprocessing would remove the waste problem – the waste we currently store can be reused

Bastin 8 (Clinton, Former Chemical Engineer at the Atomic Energy Commission, 21st Century Science and Technology, “We Need to Reprocess Spent Nuclear Fuel, And Can Do It Safely, At Reasonable Cost”, 2008, [http://www.21stcenturysciencetech.com/Articles%202008/ Summer\_2008/Reprocessing.pdf](http://www.21stcenturysciencetech.com/Articles%202008/Summer_2008/Reprocessing.pdf), RSR)

The concept of used nuclear fuel as “nuclear waste” is a fiction created by the opponents of nuclear energy. Used nuclear fuel isn’t waste at all, but a renewable resource that can be reprocessed into new nuclear fuel and valuable isotopes. When we entered the nuclear age, the great promise of nuclear energy wasitsrenewability, making it an inexpensive and efficient way to produce electricity. It was assumed that the nations making use of nuclear energy would reprocess their spent fuel, completing the nuclear fuel cycle by recycling the nuclear fuel after it was burned in a reactor, to extract the 95 to 99 percent of unused uranium in it that can be turned into new fuel. This means that if the United States buries its 70,000 metric tons of spent nuclear fuel, we would be wasting 66,000 metric tons of uranium-28, which could be used to make new fuel. In addition, we would be wasting about 1,200 metric tons of fissile uranium-25 and plutonium-29, which can also be burned as fuel. Because of the high energy density in the nucleus, this relatively small amount of U.S. spent fuel (it would fit in one small house) is equivalent in energy to about 20 percent of the U.S. oil reserves. About 96 percent of the spent fuel the United States is now storing can be turned into new fuel. The 4 percent of the socalled waste that remains—2,500 metric tons—consists of highly radioactive materials, but these are also usable. There are about 80 tons each of cesium-17 and strontium-90 that could be separated out for use in medical applications, such as sterilization of medical supplies. Using isotope separation techniques, and fast-neutron bombardment for transmutation (technologies that the United States pioneered but now refuses to develop), we could separate out all sorts of isotopes, like americium, which is used in smoke detectors, or isotopes used in medical testing and treatment. Right now, the United Statesmust import 90 percent of its medical isotopes, used in 40,000 medical procedures daily. The diagram shows a closed nuclear fuel cycle. At present, the United States has no reprocessing, and stores spent fuel in pools or dry storage at nuclear plants. Existing nuclear reactors use only about 1 percent of the total energy value in uranium resources; fast reactors with fuel recycle would use essentially 100 percent, burning up all of the uranium and actinides, the long-lived fission products. In a properly managed and safeguarded system, the plutonium produced in fast reactors would remain in its spent fuel until needed for recycle.Thus, there need be no excess buildup of accessible plutonium. The plutonium could also be fabricated directly into new reactor fuel assemblies to be burned in nuclear plants.

#### Proliferation concerns are empirically denied, and purification of spent fuel is impractical.

Klein, Associate Director of The Energy Institute at the University of Texas at Austin, 11 (Dale, Spent Nuclear Fuel Is An Abundant Source of Energy, 21st Century Science & Technology, 21 February 2011, http://www.21stcenturysciencetech.com/Articles\_2011/Spring-2011/Spent\_Nuclear\_Energy.pdf, da 8-23-12)

Now, more than three decades later, six nations have major ¶ ¶ commitments to reprocessing their spent fuel. The arguments ¶ ¶ against reprocessing as a proliferation concern are not compelling and obviously, other nations interested in extracting ¶ ¶ the energy value from their spent fuel do not align with U.S. ¶ ¶ policy.¶ ¶ A typical commercial nuclear power reactor will generate ¶ ¶ about 20 tonnes of spent fuel every year. Contained in that ¶ ¶ spent fuel is about 200 kilograms of reactor-grade plutonium. ¶ ¶ Often misunderstood, or misrepresented by opponents to recycling, the isotopic mixture of reactor-grade plutonium makes it ¶ ¶ unsuitable for nuclear weapons.¶ ¶ Weapons-grade plutonium is approximately 95 percent Pu-¶ ¶ 239, whereas reactor-grade is only about 50 percent Pu-239. ¶ ¶ The cost and complexity of the technologies required to purify ¶ ¶ reactor grade to weapons grade makes it impractical for use in ¶ ¶ nuclear weapons.¶ ¶ In fact, we know of, or strongly believe, that nine nations ¶ ¶ have developed nuclear weapons. Looking historically at the ¶ ¶ origins of the fissile materials used to develop those weapons, we know that the sources were either through enrichment of uranium or with the use of graphite or heavy-water-moderated production reactors, but not commercial ¶ ¶ reactors.¶ ¶ Israel, India, Pakistan, and North Korea are believed to have ¶ ¶ produced weapons-grade plutonium from the diversion of ¶ ¶ their heavy water research reactors to irradiate target materials. No nation has ever tried to produce nuclear weapons ¶ ¶ from the type of spent fuel discharged by commercial power ¶ ¶ reactors.

### States CP

#### Perm do both. Solves GOP backlash because thirty republican governors would all back reprocessing.

#### Information distortion means the CP links to politics

**Kiely, ‘12** [2/17/12, Eugene Kiely, Washington assignment editor USA today, “Did Obama ‘Approve’ Bridge Work for Chinese Firms?” http://www.factcheck.org/2012/02/did-obama-approve-bridge-work-for-chinese-firms/]

Who’s to blame, if that’s the right word, if the project ends up using manufactured steel from China? The National Steel Bridge Alliance [blames](http://americanmanufacturing.org/blog/shameful-use-taxpayer-dollars-alaska) the state railroad agency. The Alliance for American Manufacturing [says](http://americanmanufacturing.org/blog/alaskan-manufacturers-outraged-potential-%E2%80%9Cmade-china%E2%80%9D-railroad-bridge) the federal Buy American laws have been “weakened with loopholes and various exemptions that make it easier for bureaucrats to purchase foreign-made goods instead of those made in American factories with American workers.” So, how did Obama get blamed for the decisions by state agencies and for state projects that, in at least one case, didn’t even use federal funds? The answer is a textbook lesson in how information gets distorted when emails go viral. We looked at the nearly 100 emails we received on this subject and found that Obama wasn’t mentioned at all in the first few emails. Typical of the emails we received shortly after the ABC News report aired was this one from Oct. 11, 2011: “I just got an email regarding Diane Sawyer on ABC TV stating that U. S. Bridges and roads are being built by Chinese firms when the jobs should have gone to Americans. Could this possible be true?” The answer: Yes, it’s true. End of story, right? Wrong. Days later, emails started to appear in our inbox that claimed ABC News reported that Chinese firm were receiving stimulus funds to build U.S. bridges — even though the broadcast news story didn’t mention stimulus funds at all. (The report did include a clip of Obama delivering a speech on the need to rebuild America’s bridges and put Americans to work, but said nothing about the president’s $830 billion stimulus bill.) Still, we received emails such as this one on Nov. 4, 2011, that included this erroneous claim language: “Stimulus money meant to create U.S. jobs went to Chinese firms. Unbelievable….” It didn’t take long for Obama to be blamed. That same day — Nov. 4, 2011 — we received an email that made this leap to Obama: “SOME CHINESE COMPANIES WHO ARE BUILDING ‘OUR’ BRIDGES. (3000 JOBS LOST TO THE CHINESE FIRM)…..AND NOW OBAMA WANTS ‘MORE STIMULUS MONEY’…..THIS IS NUTS ! ! ! If this doesn’t make you furious nothing will….” This year, Obama’s name started to surface in the subject line of such critical emails — raising the attack on the president to yet another level and perhaps ensuring the email will be even more widely circulated. Since Jan. 17, we have gotten more than a dozen emails with the subject line, “ABC News on Obama/USA Infrastructure,” often preceded with the word “SHOCKING” in all caps. The emails increasingly contain harsh language about the president. Since Jan. 11, 23 emails carried this added bit of Obama-bashing: “I pray all the unemployed see this and cast their votes accordingly in 2012!” One of those emails — a more recent one from Feb. 8 — contained this additional line: “Tell me again how Obama’s looking out for blue collar guys. He cancels pipelines, and lets Chinese contractors build our bridges…” And so it goes, on and on. All from a news report that blamed state officials — not Obama — for spending taxpayer money on Chinese firms to build U.S. bridges.

#### CP can’t solve – federal investment is necessary to remove the perceptual ban on reprocessing.

Adams, ‘8

[Rod, “What Do You Do About the Waste? Recycle and Reuse”, Clean Technica, 5-29-2008,

<http://cleantechnica.com/2008/05/29/what-do-you-do-about-the-waste-recycle-and-reuse/>, RSR]

The US used to have a plan to recycle our fuel as well, but a great deal of marketing and pressure by people that do not like the idea of using plutonium as a source of commercial heat resulted in President Ford issuing a presidential order to temporarily halt nuclear fuel recycling in 1976. President Carter, a man who claimed to be a nuclear engineer, made that ban permanent in the hopes that forcing US companies to avoid fuel recycling would cause others to abandon the very logical idea. That effort did not work as planned, but the people who had invested large amounts of time and money into building three recycling plants in the US only to have them shut down with the stroke of a pen decided “once bitten, twice shy.” Though President Reagan removed the ban, President Clinton essentially reinstated it and no commercial company has been willing to build a facility and risk having it turn into a white elephant after an election.

#### CP can’t solve - federal preemption of the counterplan exists now

Ostrow, associate professor of law at Hofstra Law School, ’11

(Ashira Pelman Ostrow, “Process Preemption in Federal Siting Regimes, Harvard Journal of Law, July 2011, <http://www.harvardjol.com/wp-content/uploads/2011/07/Ostrow_Article.pdf>)

For national security reasons, the federal government has long asserted exclusive authority to manage high-level radioactive waste. 130 The Atomic Energy Act of 1954 131 and the Energy Reorganization Act of 1974 132 granted the Nuclear Regulatory Commission (“NRC”) exclusive regulatory authority over high-level nuclear waste facilities. 133 The statutes left no room for state participation, other than in an advisory capacity for certain transportation issues. 134 Nonetheless, by the late 1970s, the states began to actively regulate, restrict, and even ban the shipment of highly toxic nuclear waste and the establishment of radioactive waste facilities within their borders. 135 To resolve the jurisdictional conflict, Congress enacted the Nuclear Waste Policy Act of 1982 (“NWPA”). 136 The Act was intended to “establish a schedule for the siting, construction, and operation of repositories” to protect the public and the environment “from the hazards posed by high-level radioactive waste.” 137 The NWPA required the Secretary of Energy to nominate five sites for a high-level radioactive waste repository and to recommend three of them to the President for further study by January 1, 1985. 138 The Act further required the Secretary of Energy to develop guidelines by which to evaluate potential repository sites. 139

#### Congress is necessary – overcomes regulatory process.

Fertel, Senior Vice President and Chief Nuclear Officer at the Nuclear Energy Institute, ‘5

[Marvin, CQ Congressional Testimony, “NUCLEAR POWER'S PLACE IN A NATIONAL ENERGY POLICY,” 4/28, lexis]

Industry and government will be prepared to meet the demand for new emission-free baseload nuclear plants in the 2010 to 2020 time frame only through a sustained focus on the necessary programs and policies between now and then. As it has in the past, strong Congressional oversight will be necessary to ensure effective and efficient implementation of the federal government's nuclear energy programs, and to maintain America's leadership in nuclear technology development and its influence over important diplomatic initiatives like nonproliferation. Such efforts have provided a dramatic contribution to global security, as evidenced by the U.S.-Russian nonproliferation agreement to recycle weapons-grade material from Russia for use in American reactors. Currently, more than 50 percent of U.S. nuclear power plant fuel depends on converted Russian warhead material. Nowhere is continued congressional oversight more important than with DOE's program to manage the used nuclear fuel from our nuclear power plants. Continued progress toward a federal used nuclear fuel repository is necessary to support nuclear energy's vital role in a comprehensive national energy policy and to support the remediation of DOE defense sites. Since enactment of the 1982 Nuclear Waste Policy Act, DOE's federal repository program has repeatedly overcome challenges, and challenges remain before the Yucca Mountain facility can begin operation. But as we address these issues, it is important to keep the overall progress of the program in context. There is international scientific consensus that a deep geologic repository is the best solution for long-term disposition of used military and commercial nuclear power plant fuel and high-level radioactive byproducts. The Bush administration and Congress, with bipartisan support, affirmed the suitability of Yucca Mountain for a repository in 2002. Over the past three years, the Energy Department and its contractors have made considerable progress providing yet greater confirmation that this is the correct course of action and that Yucca Mountain is an appropriate site for a national repository. --During the past year, federal courts have rejected significant legal challenges by the state of Nevada and others to the Nuclear Waste Policy Act and the 2002 Yucca Mountain site suitability determination. These challenges questioned the constitutionality of the Yucca Mountain Development Act and DOE's repository system, which incorporates both natural and engineered barriers to contain radioactive material safely. In the coming year, Congress will play an essential role in keeping this program on schedule, by taking the steps necessary to provide increased funding for the project in fiscal 2006 and in future years. Meeting DOE's schedule for initial repository operation requires certainty in funding for the program. This is particularly critical in view of projected annual expenditures that will exceed $1 billion beginning in fiscal 2007. Meeting these budget requirements calls for a change in how Congress provides funds to the project from monies collected for the Nuclear Waste Fund. The history of Yucca Mountain funding is evidence that the current funding approach must be modified. Consumer fees (including interest) committed to the Nuclear Waste Fund since its f6rmation in 1983 total more than $24 billion. Consumers are projected to pay between $750 million to $800 million to the fund each year, based on electricity generated at the nation's 103 reactors. This is more than $2 million per day. Although about $8 billion has been used for the program, the balance in the fund is nearly $17 billion. In each of the past several years, there has been a gap between the annual fees paid by consumers of electricity from nuclear power plants and disbursements from the fund for use by DOE at Yucca Mountain. Since the fund was first established, billions of dollars paid by consumers of electricity from nuclear power plants to the Nuclear Waste Fund-intended solely for the federal government's used fuel program-in effect have been used to decrease budget deficits or increase surpluses. The industry believes that Congress should change the funding mechanism for Yucca Mountain so that payments to the Nuclear Waste Fund can be used only for the project and be excluded from traditional congressional budget caps. Although the program should remain subject to congressional oversight, Yucca Mountain appropriations should not compete each year for funding with unrelated programs when Congress directed a dedicated funding stream for the project. The industry also believes that it is appropriate and necessary to consider an alternative perspective on the Yucca Mountain project. This alternative would include an extended period for monitoring operation of the repository for up to 300 years after spent fuel is first placed underground. The industry believes that this approach would provide ongoing assurance and greater confidence that the repository is performing as designed, that public safety is assured, and that the environment is protected. It would also permit DOE to apply evolving innovative technologies at the repository. Through this approach, a scientific monitoring program would identify additional scientific information that can be used in repository performance models. The project then could update the models, and make modifications in design and operations as appropriate. Congressional committees like this one can help ensure that DOE does not lose sight of its responsibility for used nuclear fuel management and disposal, as stated by Congress in the Nuclear Waste Policy Act of 1982. The industry fully supports the fundamental need for a repository so that used nuclear fuel and the byproducts of the nation's nuclear weapons program are securely managed in an underground, specially designed facility. World-class science has demonstrated that Yucca Mountain is the best site for that facility. A public works project of this magnitude will inevitably face challenges. Yet, none is insurmountable. DOE and its contractors have made significant progress on the project and will continue to do so as the project enters the licensing phase. Congressional oversight also can play a key role in maintaining and encouraging the stability of the NRC's regulatory process. Such stability is essential for our 103 operating nuclear plants and equally critical in licensing new nuclear power plants. Congress played a key role several years ago in encouraging the NRC to move toward a new oversight process for the nation's nuclear plants, based on quantitative performance indicators and safety significance. Today's reactor oversight process is designed to focus industry and NRC resources on equipment, components and operational issues that have the greatest importance to, and impact on, safety. The NRC and the industry have worked hard to identify and implement realistic security requirements at nuclear power plants. In the three-and-a-half years since 9/11, the NRC has issued a series of requirements to increase security and enhance training for security programs. The industry complied-fully and rapidly. In the days and months following Sept. 11, quick action was required. Orders that implemented needed changes quickly were necessary. Now, we should return to the orderly process of regulating through regulations. The industry has spent more than $1 billion enhancing security since September 2001. We've identified and fixed vulnerabilities. Today, the industry is at the practical limit of what private industry can do to secure our facilities against the terrorist threat. NRC Chairman Nils Diaz and other commissioners have said that the industry has achieved just about everything that can be reasonably achieved by a civilian force. The industry now needs a transition period to stabilize the new security requirements. We need time to incorporate these dramatic changes into our operations and emergency planning programs and to train our employees to the high standards of our industry-and to the appropriately high expectations of the NRC. Both industry and the NRC need congressional oversight to support and encourage this kind of stability. CONCLUSION Electricity generated by America's nuclear power plants over the past half-century has played a key part in our nation's growth and prosperity. Nuclear power produces over 20 percent of the electricity used in the United States today without producing air pollution. As our energy demands continue to grow in years to come, nuclear power should play an even greater role in meeting our energy and environmental needs. The nuclear energy industry is operating its reactors safely and efficiently. The industry is striving to produce more electricity from existing plants. The industry is also developing more efficient, next-generation reactors and exploring ways to build them more cost-effectively. The public sector, including the oversight committees of the U.S. Congress, can help maintain the conditions that ensure Americans will continue to reap the benefits of our operating plants, and create the conditions that will spur investment in America's energy infrastructure, including new nuclear power plants. One important step is passage of comprehensive energy legislation that recognizes nuclear energy's contributions to meeting our growing energy demands, ensuring our nation's energy security and protecting our environment. Equally important, however, is the need to ensure effective and efficient implementation of existing laws, like the Nuclear Waste Policy Act, and to provide federal agencies with the resources and oversight necessary to discharge their statutory responsibilities in the most efficient way possible. The commercial nuclear power sector was born in the United States, and nations around the world continue to look to this nation for leadership in this technology and in the issues associated with nuclear power. Our ability to influence critical international policies in areas like nuclear nonproliferation, for example, depends on our ability to maintain a leadership role in prudent deployment, use and regulation of nuclear energy technologies here at home, in the United States, and on our ability to manage the technological and policy challenges-like waste management-that arise with all advanced technologies.

#### US stance against reprocessing hurts relations with South Korea and results in South Korean nuclearization.

Yurman, Staff Writer, ‘12

[Dan, “Revisiting Reprocessing in South Korea”, ANS Nuclear Café, 8-2-12,

<http://ansnuclearcafe.org/2012/08/02/revisiting-reprocessing-in-south-korea/>, RSR]

Comes now the request by the South Korean government, first aired in October 2010, to revise the bilateral cooperation treaty with the U.S. It has been in place for more than 40 years and it is a cornerstone of U.S./South Korean diplomatic relations. Many specialists in the field of nonproliferation see a “hard and fast” policy against any expansion of uranium enrichment and spent fuel reprocessing as a key to stopping states like North Korea from pursuing these activities. That strategy hasn’t worked and, as a result, South Korea wants relief from the restriction in the now-decades-old treaty. Negotiations over changes to the treaty have been going on since last December, but appear to be stalemated around a key set of issues. It is a delicate dance, as diplomats like to say, because if the U.S. leans too heavily on South Korea, it could sour relations between the two countries and spawn nationalist sentiment that might lead to a nuclear weapons program. Since the 1950s, South Korea has depended on the U.S. nuclear arsenal as a shield against aggression from its neighbor to the north.

#### US-SoKo relations k2 regional stability and global security

Clinton 10 [Hillary Rodham Clinton, “America’s Engagement in the Asia-Pacific”, October 28, 2010, http://www.state.gov/secretary/rm/2010/10/150141.htm]

This year also marked a milestone with another ally: the 60th anniversary of the start of the Korean War, which Secretary Gates and I commemorated in Seoul this past summer. And in two weeks, our presidents will meet in Seoul when President Obama travels there for the G-20 summit. Our two countries have stood together in the face of threats and provocative acts from North Korea, including the tragic sinking of the Cheonan by a North Korean torpedo. We will continue to coordinate closely with both Seoul and Tokyo in our efforts to make clear to North Korea there is only one path that promises the full benefits of engagement with the outside world – a full, verifiable, and irreversible denuclearization.The alliance between South Korea and the United States is a lynchpin of stability and security in the region and now even far beyond. We are working together in Afghanistan, where a South Korean reconstruction team is at work in Parwan Province; in the Gulf of Aden, where Korean and U.S. forces are coordinating anti-piracy missions. And of course, beyond our military cooperation, our countries enjoy a vibrant economic relationship, which is why our two Presidents have called for resolving the outstanding issues related to the U.S.-Korea Free Trade Agreement by the time of the G-20 meeting in Seoul.

#### East Asian instability leads to World War III

Knight Ridder 2k

(Jonathon S. Landay, “Top administration officials warn stakes for U.S. are high in Asian conflicts”, 3-11, L/N)

Few if any experts think China and Taiwan, North Korea and South Korea, or India and Pakistan are spoiling to fight. But **even a minor miscalculation by any of them could destabilize Asia, jolt the global economy and even start a nuclear war**. India, Pakistan and China all have nuclear weapons, and North Korea may have a few, too. **Asia lacks the kinds of organizations, negotiations and diplomatic relationships that helped keep an uneasy peace for five decades in Cold War Europe. "Nowhere else on Earth are the stakes as high and relationships so fragile**," said Bates Gill, director of northeast Asian policy studies at the Brookings Institution, a Washington think tank. "**We see the convergence of great power interest overlaid with lingering confrontations with no institutionalized security mechanism in place. There are elements for potential disaster**."

### NNSA DA

#### Warming outweighs on magnitude.

The New York End Times 6 The New York End Times is a non-partisan, non-religious, non-ideological, free news filter. We monitor world trends and events as they pertain to two vital threats - war and extinction. We use a proprietary methodology to quantify movements between the extremes of war and peace, harmony and extinction. http://newyorkendtimes.com/extinctionscale.asp

We rate Global Climate Change as a greater threat for human extinction in this century. Most scientists forecast disruptions and dislocations, if current trends persist. The extinction danger is more likely if we alter an environmental process that causes harmful effects and leads to conditions that make the planet uninhabitable to humans. Considering that there is so much that is unknown about global systems, we consider climate change to be the greatest danger to human extinction. However, there is no evidence of imminent danger. Nuclear war at some point in this century might happen. It is unlikely to cause human extinction though. While several countries have nuclear weapons, there are few with the firepower to annihilate the world. For those nations it would be suicidal to exercise that option. The pattern is that the more destructive technology a nation has, the more it tends towards rational behavior. Sophisticated precision weapons then become better tactical options. The bigger danger comes from nuclear weapons in the hands of terrorists with the help of a rogue state, such as North Korea. The size of such an explosion would not be sufficient to threaten humanity as a whole. Instead it could trigger a major war or even world war. Under this scenario human extinction would only be possible if other threats were present, such as disease and climate change. We monitor war separately. However we also need to incorporate the dangers here .

#### NNSA is actually terrible and incapable of solving anything – government review – also their cards explaining why they’ve failed are Michael Scott-level excuses

Oak Ridge Environmental Alliance 12 [Sep 11, 2012, “OREPA calls for Abolition of NNSA, cites numerous government”, nonprofit organization, Larry Coleman, Shelley Wascom, Barbara Hickey, President, government watchdog organization]

The National Nuclear Security Administration, responsible for managing the nation’s nuclear weapons stockpile and the facilities which engineer, design, produce and test nuclear warheads, has failed to provide significant “value added” to the federal government since its founding in 2000. Instead, NNSA management incompetence has resulted in massive budget overruns and consistent failure to meet schedules on major construction projects. NNSA failure to provide rigorous oversight of operating contractors at weapons sites has led to breakdowns in basic security operations. NNSA has been the target of remarkable criticisms by the General Accounting Office and the Defense Nuclear Facilities Safety Board, including a remarkable summary of mismanagement on safety, funding, contractor oversight, and project management incompetence released on Tuesday, September 12, 2012 by the GAO in its testimony before Congress. Aside from an occasional personnel shuffle and a rigorous effort to shift blame to contractors, NNSA’s response to criticisms is consistently, “We get it now, we’re compiling lessons learned, we’ll do better.”

#### Disease can’t cause extinction – it’s genetically impossible

Richard Posner, Senior Lecturer in Law at the University of Chicago, judge on the United States Court of Appeals for the Seventh Circuit, January 1, 2005**,** Skeptic, “Catastrophe: the dozen most significant catastrophic risks and what we can do about them,” <http://goliath.ecnext.com/coms2/gi_0199-4150331/Catastrophe-the-dozen-most-significant.html#abstract>

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

#### No tradeoffs—different talent pool, new nuclear demand solves

APS 8

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

Workforce shortages in the arena of commercial nuclear power, and the problem of maintaining modernized training facilities, mainly stem from the 30-year stasis in U.S. demand for new civilian nuclear power plants1. The number of operating civilian nuclear reactors in the U.S. has remained at about 100 during this time. Thus, U.S. vendors have been forced to look abroad for sales. Some have either ceased construction of new reactors entirely or else significantly scaled back business in this area. Their continuing, largely static, nuclear engineering workforce needs have been met through a combination of hiring those trained in university nuclear engineering programs and retraining others whose original expertise was in some other field (usually mechanical engineering). Retirees from the nuclear Navy also have played an important role. A natural result of this stasis was for many years a greatly reduced interest among undergraduates in nuclear science and engineering programs2. In turn, this put great pressure on U.S. universities to scale back in these areas. Recently, however, the Federal government, through the Department of Energy (DOE), dramatically increased funding for these educational efforts. This played a major role in increasing undergraduate student enrollments in nuclear engineering from a low point of 480 in 1999 to 1,933 in 2007. Declaring the problem to be solved, DOE called for the termination of its university nuclear science and engineering programs for FY 2007. Congress in turn provided reduced funding for FY 2007 and transferred all the programs except reactor fuel services to the Nuclear Regulatory Commission (NRC) for FY 2008. These “feast or famine” gyrations have led to significant instabilities: the number of university nuclear engineering departments has decreased from 66 in the early 1980s to 30 today, and the number of university reactors has dwindled from 63 to 25 during essentially the same period.

### Immigration Reform

#### Norms and economic interdependence check Asian war.

Eskildsen, Assistant Professor of Japanese History at Smith College, ‘9

[Robert, “Whither East Asia? Reflections on Japan’s Colonial Experience in Taiwan”, The Asia-Pacific Journal, 3-22,

<http://japanfocus.org/-Robert-Eskildsen/2058>, RSR]

The Meiji Restoration gave Japan the flexibility to pursue changes in the diplomatic status quo in East Asia, but the changes carried with them enormous risks. Domestically, Japan implemented radical institutional changes in order to conform more closely to Western norms, but doing so alienated important constituencies—farmers and samurai—and ultimately provoked armed rebellion. In foreign relations, Japan set out to learn the norms of Western diplomacy and use them to clarify a number of border relationships: with Russia in the north, Korea in the west, and China in the south—through a complex intermediate zone that included the Ryukyu archipelago and Taiwan. The process of redefining Japan’s borders in the west and south proved particularly troublesome and embroiled Japan in a sustained challenge to China’s diplomatic supremacy in East Asia that involved gunboat diplomacy, diplomatic coercion and armed conflict. Although it involved no clash with Chinese forces, the Taiwan Expedition was the earliest of these armed conflicts. Fast forward to the present, and we see that some of the issues that clouded the future of East Asia in the second half of the nineteenth century have contemporary analogues, although the geopolitical context has changed dramatically in the last 150 years. The biggest difference in the geopolitical context, of course, is that all the states in the region, with the possible exception of North Korea, are committed to operating within the international system and they have developed a measure of economic interdependence. These factors will mitigate the possibility of armed conflict in the future. On the other hand, nationalism, the legacies of Japanese imperialism, World War II and the Cold War, and China’s growing economic stature already exacerbate diplomatic conflicts, and they undoubtedly will continue to do so for many years to come. Against this geopolitical backdrop, three contemporary strategic conflicts stand out as particularly troublesome.

#### No comprehensive reform – House Republicans remain too divided on the issue.

NYT, 2-6

[The New York Times, “Immigration and the Middle Ground”, 2-6-13,

http://www.nytimes.com/2013/02/07/opinion/immigration-reform-and-the-false-middle-ground.html?\_r=0]

But House Republicans aren’t there yet. The tone at the hearing was set when the committee chairman, Representative Robert Goodlatte of Virginia, asked a witness: “Are there options that we should consider between the extremes of mass deportation and a pathway to citizenship for those not lawfully present in the United States?” The false middle ground he and others on the committee seemed to be seeking was limbo: legal status without hope of citizenship. Or, second-class noncitizens.¶ The witness, Mayor Julián Castro of San Antonio, responded that there was nothing extreme about turning immigrants into Americans. “If we look at our history,” he said, “Congress over time has chosen that option, that path to citizenship.”¶ Republicans have been so estranged from a reasonable immigration discussion that it’s not surprising they don’t know what one looks like. Since the last big bipartisan reform died in 2007, Republicans have dug into a trench on the far right, declaring that legalization in any form is anathema. The re-election of Mr. Obama and the dismal performance by Republicans among Hispanic voters rattled the party deeply and dislodged some Republicans from that noxious orthodoxy.¶ Judging from Tuesday’s hearing, many in the party still see immigrants as problems to be separated and contained. Republican committee members seemed willing only to discuss making Americans of small subsets, like “highly skilled” immigrants in technical fields, leaving aside most everyone else. Representative Spencer Bachus of Alabama and some like-minded witnesses dismissed citizenship as too “toxic” to discuss. Their defeatism was yet more evidence of a party deeply out of step with public opinion and American history, in which waves of newcomers have been absorbed into the republic without being forced into a permanent underclass.

#### Cantor and House Republicans support nuclear power

Politico 11 (Cantor: nuclear power 'essential' for U.S. energy needs, http://www.politico.com/blogs/glennthrush/0311/Cantor\_nuclear\_power\_essential\_for\_US\_energy\_needs.html)

House Majority Leader Eric Cantor defended nuclear energy production Monday, after a series of explosions at a nuclear reactor in Japan, calling it “essential” to meeting American energy needs. The problems at the Fukushima plant 150 miles north of Tokyo have reignited the debate over the safety of nuclear energy production. Cantor told reporters Monday that the tsunami that ravaged Japan last week is to blame, not the reactor itself. “As far as we know, this is the result of a tsunami,” he said. “Nuclear power is an essential mix of the energy economy in this country.” The tsunami caused technical problems at the Japanese plant, which left nuclear rods exposed, raising the specter of Chernobyl-style meltdown. The timing couldn’t have been worse for House Republican leaders, who demanded last week that President Barack Obama speed up approval of new nuclear energy facilities.

#### Obama needs to rally Democrats for immigration reform.

Feldmann, 2-7

[Linda, “Why Obama is on charm offensive with Democrats”, The Christian Monitor,

<http://www.csmonitor.com/USA/Politics/2013/0207/Why-Obama-is-on-charm-offensive-with-Democrats>, RSR]

By making these visits, Obama was reinforcing a truism about the presidency: Rallying your own troops can be just as important as reaching out to the other side, particularly when at least one chamber is in the other party’s hands. And you can’t always count on members of your own party to be there for you.¶ During his first term, Obama faced criticism for being aloof and not reaching out to either side of the aisle, at times hurting his own cause. In his first two years in office, with Democratic majorities in both houses of Congress, Obama won significant legislative victories – including the biggest economic stimulus package in history, health-care reform, and financial reform. But the conservative backlash was fierce, and in the 2010 midterms, the Republicans swept into power in the House. Gridlock has stymied action since, exacerbated by Obama’s lack of close relationships on Capitol Hill, analysts say.¶ “Wooing of caucuses is something he didn’t do much in his first term, and it hurt him,” says Jennifer Duffy, a political analyst at the nonpartisan Cook Political Report. “Members of his own party felt very disconnected from him. I think in the second term, with some big agenda items, the White House has decided it’s time to engage and actively work those groups.”¶ One first-term example, she says, where some more schmoozing with Capitol Hill allies could have helped him avoid political and economic damage: the messy debt-ceiling negotiations in the summer of 2011, which led to the downgrading of the nation’s credit rating.

#### Senate democrats love nuclear power – perceived safer than alternatives, public backs it and Fukushima doesn’t matter.

Bartash, ‘11

[Jeffry, “Democrats warm to nuclear, domestic drilling”, 4-15-11, Marketwatch

<http://articles.marketwatch.com/2011-04-15/economy/30789692_1_nuclear-power-nuclear-plants-nuclear-energy>, RSR]

WASHINGTON (MarketWatch) — At a hearing this week, Democratic Sen. Tom Carper of Delaware asked one of the nation’s top regulators how many Americans have been killed by nuclear power. ”There are no known fatalities in the U.S. from the use of nuclear energy,” replied Gregory Jaczko, chairman of the Nuclear Regulatory Commission. Carper then turned to Lisa Jackson, administrator of the Environmental Protection Agency. He asked her how many people have been killed or had their lives shortened by the use of pollution-emitting fossil fuels. Tens of thousands, she said. The senator sat back in his chair and nodded. “All sources of energy involve risks,” he said. Carper, a longtime supporter of nuclear power, is not the only Democrat who’s weighing every option available on how to fuel the massive U.S. economy. Many other members of his party are as well — no doubt egged on by soaring gas prices and public discontent. And while Democrats aren’t chanting “drill, baby, drill,” they appear to be concluding that nuclear power and more domestic drilling, once anathema, are vital to America’s energy future. At several hearings this week, nary a word was said about abolishing nuclear power despite the recent disaster in Japan. And Democrats say the are open to drilling for more natural gas in the continental U.S. despite growing concerns over an extraction practice called “fracking.”

#### Any bill attached to Obama will fail – GOP will oppose on principle

Hennessey 1-27-13 [Kathleen, Los Angeles Times, Obama cautious on immigration; He's promised a bill, but Republicans aren't likely to sign on if it bears his stamp, p. A1]

As President Obama settles on a strategy to overhaul the nation's immigration laws, he faces a quandary that speaks volumes about the bitter nature of politics in a divided capital: The very fact that a plan has Obama's name on it might be enough to kill it.¶ Obama will relaunch his drive for an immigration overhaul Tuesday in Las Vegas, where heavy turnout by Latino voters in November helped seal his reelection. But some allies in Congress warn that embracing too specific a proposal could mean its death warrant.¶ Republicans, they say, would feel compelled to oppose a bill identified explicitly with the president. Better, they advise, to announce broad principles and avoid particulars, even if that means violating a campaign pledge to propose legislation. Obama promised to do that in his first campaign, did not deliver, and repeatedly vowed during his reelection campaign to make up for that failure.¶ The toxic nature of the Obama brand in Republican circles has become a factor that affects White House decisions large and small. Aides still recall with astonishment that when Obama invited members of Congress to the White House to watch the movie "Lincoln" last year, at a screening attended by some of the film's stars, not a single GOP lawmaker attended.

### Production K

#### Abandoning politics causes war, slavery, and authoritarianism – flips the K.

Boggs 2k (CAROL BOGGS, PF POLITICAL SCIENCE – SOUTHERN CALIFORNIA, 00, THE END OF POLITICS, 250-1)

But it is a very deceptive and misleading minimalism. While Oakeshott debunks political mechanisms and rational planning, as either useless or dangerous, the actually existing power structure-replete with its own centralized state apparatus, institutional hierarchies, conscious designs, and indeed, rational plans-remains fully intact, insulated from the minimalist critique. In other words, ideologies and plans are perfectly acceptable for elites who preside over established governing systems, but not for ordinary citizens or groups anxious to challenge the status quo. Such one-sided minimalism gives carte blanche to elites who naturally desire as much space to maneuver as possible. The flight from “abstract principles” rules out ethical attacks on injustices that may pervade the status quo (slavery or imperialist wars, for example) insofar as those injustices might be seen as too deeply embedded in the social and institutional matrix of the time to be the target of oppositional political action. If politics is reduced to nothing other than a process of everyday muddling-through, then people are condemned to accept the harsh realities of an exploitative and authoritarian system, with no choice but to yield to the dictates of “conventional wisdom”. Systematic attempts to ameliorate oppressive conditions would, in Oakeshott’s view, turn into a political nightmare. A belief that totalitarianism might results from extreme attempts to put society in order is one thing; to argue that all politicized efforts to change the world are necessary doomed either to impotence or totalitarianism requires a completely different (and indefensible) set of premises. Oakeshott’s minimalism poses yet another, but still related, range of problems: the shrinkage of politics hardly suggests that corporate colonization, social hierarchies, or centralized state and military institutions will magically disappear from people’s lives. Far from it: the public space vacated by ordinary citizens, well informed and ready to fight for their interests, simply gives elites more room to consolidate their own power and privilege. Beyond that, the fragmentation and chaos of a Hobbesian civil society, not too far removed from the excessive individualism, social Darwinism and urban violence of the American landscape could open the door to a modern Leviathan intent on restoring order and unity in the face of social disintegration. Viewed in this light, the contemporary drift towards antipolitics might set the stage for a reassertion of politics in more authoritarian and reactionary guise-or it could simply end up reinforcing the dominant state-corporate system. In either case, the state would probably become what Hobbes anticipated: the embodiment of those universal, collective interests that had vanished from civil society.16 And either outcome would run counter to the facile antirationalism of Oakeshott’s Burkean muddling-through theories.

#### **Perm: do both—the plan’s approach to the current energy crisis presents a unique opportunity to reform overconsumption**

Peters 12 (Michael A Peters 2012, [Michael A. Peters is professor of education at the University of Waikato in New Zealand and professor emeritus at the University of Illinois at Urbana-Champaign. ]10 June 2012, “Greening the Knowledge Economy: A Critique of Neoliberalism,” Truthout, http://truth-out.org/news/item/9642-greening-the-knowledge-economy-a-critique-of-neoliberalism)

Ecopolitics must come to terms with the scramble for resources that increasingly dominates the competitive motivations and long-range resource planning of the major industrial world powers. There are a myriad of new threats to the environment that have been successfully spelled out by eco-philosophers and that have already begun to impact upon the world in all their facets. First, there is the depletion of non-renewable resources - in particular, oil, gas, timber and minerals. Second, and in related fashion, is the crisis of energy itself, upon which the rapidly industrializing countries and the developed world depend. Third, the rise of China and India, with their prodigious appetites, which will match the United States within a few decades in rapacious demand for more of everything that triggers resource scrambles and the heavy investment in resource-rich regions such as Africa. Fourth, global climate change will have the greatest impact upon the world's poorest countries, multiplying the risk of conflict and resource wars. With these trends and possible scenarios, only a better understanding of the environment can save us and the planet. A better understanding of the earth's environmental system is essential if scientists **working in concert with communities, ecology** groups **across the board, green politicians, policymakers and business leaders** are to promote green exchange and to ascertain whether green capitalism strategies that aim at long-term sustainability are possible. The energy crisis may be a blessing in disguise for the United States. Jeremy Rifkin (2002) envisions a new economy powered by hydrogen that will fundamentally change the nature of our market, political and social institutions as we approach the end of the fossil-fuel era, with inescapable consequences for industrial society. New hydrogen fuel-cells are now being pioneered - which, together with the design principles of smart information technologies, can provide new distributed forms of energy use. While Thomas Friedman (2008) has also argued the crisis can lead to reinvestment in infrastructure and alternative energy sources in the cause of nation-building, his work and intentions have been called into question.[2] Education has a fundamental role to play in the new energy economy, both in terms of changing worldviews and the promotion of a green economy, and also in terms of research and development's contribution to energy efficiency, battery storage and new forms of renewable energy

#### The plan is not an absolute growth in nuclear energy, rather it forwards a new paradigm to approach consumption. The status quo explicitly fails to deal with the excesses of consumption by allowing waste to pile up with no consequence. Plan reckons with this.

Rawles, Lecturer at the University of Edinburgh, 2k

[Richard, “Coyote Learns to Glow”, Part of “Learning to Glow: A Nuclear Reader”, RSR]

Humans, having gathered uranium from the New Mexican desert not all that far from Yucca Mountain, have harnessed the energy within the atom, for commercial and security purposes, in effect by “tricking" nature out of its secret power. We are aided in our industry by this supposedly "free” energy source. As Martin Heidegger observed, we regard the natural world as a “standing reserve:’ there for the plundering-the military metaphor is more than apt in this case. Having stolen from nature its hidden fire, we delude ourselves into believing that there’s no reckoning, no balancing of accounts, despite even the scientific evidence, which tells us there are no free meals in nature’s unforgiving cycles. We are burdened by the waste from this virtual cornucopia, much as the Greeks of the early classical period projected into Pandora's box of woes the burdens of civilizing fire—its destructive aspects, along with the rituals needed to maintain the fire.

#### Perm: do the plan and all non-competitive parts of the alternative – including a focus on consumption solves all of the residual links to the Aff

#### State focused nuclear power solutions are good.

Nordhaus 11, chairman – Breakthrough Instiute, and Shellenberger, president – Breakthrough Insitute, MA cultural anthropology – University of California, Santa Cruz, 2/25/‘11

(Ted and Michael, <http://thebreakthrough.org/archive/the_long_death_of_environmenta>)

Tenth, we are going to have to get over our suspicion of technology, especially nuclear power. There is no credible path to reducing global carbon emissions without an enormous expansion of nuclear power. It is the only low carbon technology we have today with the demonstrated capability to generate large quantities of centrally generated electrtic power. It is the low carbon of technology of choice for much of the rest of the world. Even uber-green nations, like Germany and Sweden, have reversed plans to phase out nuclear power as they have begun to reconcile their energy needs with their climate commitments. Eleventh, we will need to embrace again the role of the state as a direct provider of public goods. The modern environmental movement, borne of the new left rejection of social authority of all sorts, has embraced the notion of state regulation and even creation of private markets while largely rejecting the generative role of the state. In the modern environmental imagination, government promotion of technology –whether nuclear power, the green revolution, synfuels, or ethanol - almost always ends badly. Never mind that virtually the entire history of American industrialization and technological innovation is the story of government investments in the development and commercialization of new technologies. Think of a transformative technology over the last century - computers, the Internet, pharmaceutical drugs, jet turbines, cellular telephones, nuclear power - and what you will find is government investing in those technologies at a scale that private firms simply cannot replicate. Twelveth, big is beautiful. The rising economies of the developing world will continue to develop whether we want them to or not. The § Marked 16:44 § solution to the ecological crises wrought by modernity, technology, and progress will be more modernity, technology, and progress. The solutions to the ecological challenges faced by a planet of 6 billion going on 9 billion will not be decentralized energy technologies like solar panels, small scale organic agriculture, and a drawing of unenforceable boundaries around what remains of our ecological inheritance, be it the rainforests of the Amazon or the chemical composition of the atmosphere. Rather, these solutions will be: large central station power technologies that can meet the energy needs of billions of people increasingly living in the dense mega-cities of the global south without emitting carbon dioxide, further intensification of industrial scale agriculture to meet the nutritional needs of a population that is not only growing but eating higher up the food chain, and a whole suite of new agricultural, desalinization and other technologies for gardening planet Earth that might allow us not only to pull back from forests and other threatened ecosystems but also to create new ones. The New Ecological Politics The great ecological challenges that our generation faces demands an ecological politics that is generative, not restrictive. An ecological politics capable of addressing global warming will require us to reexamine virtually every prominent strand of post-war green ideology. From Paul Erlich's warnings of a population bomb to The Club of Rome's "Limits to Growth," contemporary ecological politics have consistently embraced green Malthusianism despite the fact that the Malthusian premise has persistently failed for the better part of three centuries. Indeed, the green revolution was exponentially increasing agricultural yields at the very moment that Erlich was predicting mass starvation and the serial predictions of peak oil and various others resource collapses that have followed have continue to fail. This does not mean that Malthusian outcomes are impossible, but neither are they inevitable. We do have a choice in the matter, but it is not the choice that greens have long imagined. The choice that humanity faces is not whether to constrain our growth, development, and aspirations or die. It is whether we will continue to innovate and accelerate technological progress in order to thrive. Human technology and ingenuity have repeatedly confounded Malthusian predictions yet green ideology continues to cast a suspect eye towards the very technologies that have allowed us to avoid resource and ecological catastrophes. But such solutions will require environmentalists to abandon the "small is beautiful" ethic that has also characterized environmental thought since the 1960's. We, the most secure, affluent, and thoroughly modern human beings to have ever lived upon the planet, must abandon both the dark, zero-sum Malthusian visions and the idealized and nostalgic fantasies for a simpler, more bucolic past in which humans lived in harmony with Nature.

## 1AR

### K

#### Tech optimism based on empirical research is good---prefer specific experts.

Krier, Professor of Law at the University of Michigan, ‘85

[James, “The Un-Easy Case for Technological Optimism,” Michigan Law Review, Vol. 84, No. 3; December 1985, pp. 405-429]

A technological optimist is not simply a person with unqualified enthusiasm about technological promise. Saint-Simon (1760-1825) was an enthusiast, but he was not a technological optimist as the term is currently used. Saint-Simon, rather, was a utopian who happened to attach his vision to technocratic expertise.4 He was the forefather of Technocracy, an active utopian movement in the 1930s and one not entirely dead even today.5 Technological optimists are not utopians, but something less - let us say quasi-utopians, after a recent usage (applied to himself) of Robert Dahl's.6 Unlike any self-respecting pure utopian, quasi-utopians (and technological optimists) seek not perfection but tolerable imperfection, tolerable because it is better than anything else they consider attainable though not nearly as good as lots of alternatives that can be imagined. But technological optimists are also something more than mere believers, or faddists, or techniks.7 Their views are rigorously formulated, grounded in an apparent reality, based on knowledge and experience, and artfully defended. There are no crazies among the best of the optimists; they are conservative, respected experts who command enormous authority. They have a very specific position namely, "that exponential technological growth will allow us to expand resources ahead of exponentially increasing demands."8 This is the precise meaning of technological optimism as a term of art.

### Politics

#### Senate Democrats have to come together for reform to pass.

Bolton, 2-5

[Alexander, “Reid tries to unite Senate Dem caucus”, The Hill,

<http://thehill.com/homenews/senate/281061-reid-tries-to-unite-his-caucus>, RSR]

Senate Democrats will huddle behind closed doors on Tuesday and Wednesday as they seek to mend divisions within their caucus on gun control, immigration reform and taxes.¶ The retreat at the Westin Annapolis comes at a critical time, with Senate Democrats preparing to do battle on issues that have splintered them in the past. They will meet with President Obama on Wednesday to coordinate strategy.¶ Senate Majority Leader Harry Reid (D-Nev.) wants to achieve as much unity as possible to boost his negotiating leverage against Republicans. He knows he’ll suffer defections, but infighting must be kept to a minimum to move Obama’s agenda through Congress.¶ “What the Democrats have to do is find common ground in their own party, No. 1, or recognize there will be some issues where you won’t get the whole caucus,” said Tad Devine, a Democratic strategist. “Once they find that common ground, they need to see how far they can get with the Republicans.”