Off

They have to specify the agent who implements the plan.

That’s good

A. Ground – plan specification is key to guarantee links to all our agent DAs and CPs, which are the only stable neg ground across the different energies.

B. Education – specification is key to rational decision-making on energy.

DOE 80—Revised: An Analysis of Federal Incentives Used to Stimulate Energy Production, Feburary, http://www.scribd.com/doc/67538352/Federal-Incentives-for-Energy-Production-1980

THE ORGANIZATIONAL VIEWPOINT

In the organizational viewpoint of energy processes, various activities relevant to energy are conducted by a series of organizations. Each organization has certain characteristics, such as size, operating procedure, and structure, that determine how it will act in an energy production or consumption process. These organizations include firms that produce energy, firms that consume energy, public agencies that regulate energy, and other organizations, such as consumer and environmental groups, that seek a role in energy. The government itself is a collection of organizations.

Organizations in the government and the energy market do not make decisions in the way the economic viewpoint assumes the government does. Although the economic viewpoint assumes that the Federal Government and each consumer and producer are unitary, analytic decision-makers, the organizational view-point assumes that the Federal Government and many producers and consumers are multiple, cybernetic decision-makers. (I2) In other words, the economic view-point assumes that decision-makers react to complicated decisions with uncertain outcomes by developing a consistent set of objectives, examining a relatively complete set of alternatives in light of those objectives, and explicitly discounting for uncertainty. The organizational viewpoint assumes that decision-makers react to complicated decisions with uncertain outcomes by applying set procedures. Such procedures do not begin until an explicit problem occurs, consider only a limited set of objectives one at a time, consider only a limited set of alternatives, take the first acceptable one, and use various methods to assume away uncertainty.

Cyert and March in THE BEHAVIOR THEORY OF THE FIRM (I8) describe these search procedures. They state that one can analyze the organizational process of decision-making in terms of the variables that affect organizational goals, those that affect organizational expectations, and those that affect organizational choice. (18, p. 115)

Organizational Goals. Variables affecting the relative importance of goals include the composition of the organization, the division of labor indecision-making, and the specific problems facing the organization. Variables that affect the aspiration level on any goal include the organization's past goals, the organization's past performance, and the past performance of other "comparable" organizations.

Organizational Expectations. Variables that affect the intensity and success of search include the extent to which goals are achieved and the amountof organizational slack. Variables that affect the direction of search include the nature of the problem stimulating the search and the organizational component actually carrying out the search.

Organizational Choice. The key issues are the definition of the problem that requires a choice, the standard decision making rules applied, and the order in which alternatives are considered. Variables affecting those issues include the past experience of the organization with a given set of decision rules, the past record of slack, the organizational component actually carrying out the search, and the past experience in considering alternatives.

It’s a voter—the ballot is a key signal to deter unacceptable practices.

Off

Financial incentives are grants or loans—government purchases are distinct.

Czinkota et al 9—Associate Professor at the McDonough School of Business at Georgetown University, Michael, Fundamentals of International Business, p. 69 – google books

Incentives offered by policymakers to facilitate foreign investments are mainly of three types: fiscal, financial, and nonfinancial. Fiscal incentives are specific tax measures designed to attract foreign investors. They typically consist of special depreciation allowances, tax credits or rebates, special deductions for capital expenditures, tax holidays, and the reduction of tax burdens. Financial incentives offer special funding for the investor by providing, for example, land or buildings, loans, and loan guarantees. Nonfinancial incentives include guaranteed government purchases; special protection from competition through tariffs, import quotas, and local content requirements, and investments in infrastructure facilities.

Vote neg

Limits—government procurement allows tons of new affs dealing with the military, government research facilities and almost any government service, this explodes the topic making deep debate and predictable ground impossible.

Ground—most topic arguments assume a private-sector based increase in energy production like investment tradeoffs, environmental DAs or condition the company CPs, government procurement dodges all these.

Off

Renewables transition now—its solving warming.

Leonhardt 12—David Leonhardt is the Washington bureau chief of The New York Times, There’s Still Hope for the Planet, NYT, 7-22

Behind the scenes, however, a somewhat different story is starting to emerge — one that offers reason for optimism to anyone worried about the planet. The world’s largest economies may now be in the process of creating a climate-change response that does not depend on the politically painful process of raising the price of dirty energy. The response is not guaranteed to work, given the scale of the problem. But the early successes have been notable.

Over the last several years, the governments of the United States, Europe and China have spent hundreds of billions of dollars on clean-energy research and deployment. And despite some high-profile flops, like ethanol and Solyndra, the investments seem to be succeeding more than they are failing.

The price of solar and wind power have both fallen sharply in the last few years. This country’s largest wind farm, sprawling across eastern Oregon, is scheduled to open next month. Already, the world uses vastly more alternative energy than experts predicted only a decade ago.

Even natural gas, a hotly debated topic among climate experts, helps make the point. Thanks in part to earlier government investments, energy companies have been able to extract much more natural gas than once seemed possible. The use of natural gas to generate electricity — far from perfectly clean but less carbon-intensive than coal use — has jumped 25 percent since 2008, while prices have fallen more than 80 percent. Natural gas now generates as much electricity as coal in the United States, which would have been unthinkable not long ago.

The successes make it possible at least to fathom a transition to clean energy that does not involve putting a price on carbon — either through a carbon tax or a cap-and-trade program that requires licenses for emissions. It was exactly such a program, supported by both Barack Obama and John McCain in the 2008 campaign, that died in Congress in 2010 and is now opposed by almost all Congressional Republicans and some coal-state and oil-state Democrats.

To describe the two approaches is to underline their political differences. A cap-and-trade program sets out to make the energy we use more expensive. An investment program aims to make alternative energy less expensive.

Most scientists and economists, to be sure, think the best chance for success involves both strategies: if dirty energy remains as cheap as it is today, clean energy will have a much longer road to travel. And even an investment-only strategy is not guaranteed to continue. The clean-energy spending in Mr. Obama’s 2009 stimulus package has largely expired, while several older programs are scheduled to lapse as early as Dec. 31. In the current political and fiscal atmosphere, their renewal is far from assured.

Still, the clean-energy push has been successful enough to leave many climate advocates believing it is the single best hope for preventing even hotter summers, more droughts and bigger brush fires. “Carbon pricing is going to have an uphill climb in the U.S. for the foreseeable future,” says Robert N. Stavins, a Harvard economist who is a leading advocate for such pricing, “so it does make sense to think about other things.”

Those others things, in the simplest terms, are policies intended to help find a breakthrough technology that can power the economy without heating the planet. “Our best hope,” says Benjamin H. Strauss, a scientist who is the chief operating officer of Climate Central, a research group, “is some kind of disruptive technology that takes off on its own, the way the Internet and the fax took off.”

Governments have played a crucial role in financing many of the most important technological inventions of the past century. That’s no coincidence: Basic research is often unprofitable. It involves too much failure, and an inventor typically captures only a tiny slice of the profits that flow from a discovery.

Although government officials make mistakes when choosing among nascent technologies, one success can outweigh many failures. Washington-financed research has made possible semiconductors, radar, the Internet, the radio, the jet engine and many medical advances, including penicillin. The two countries that have made the most progress in reducing carbon emissions, France and Sweden, have done so largely by supporting nuclear and hydropower, notes Michael Shellenberger, president of the Breakthrough Institute in Oakland, Calif.

Nuclear power trades off with alternative energy.

Cochran and Paine 9—Thomas B. Cochran, Ph.D. Senior Scientist, Nuclear Program, and Christopher E. Paine Director, Nuclear Program Natural Resources Defense Council, Inc. on Nuclear Energy Developments Before the Committee on Energy and Natural Resources United States Senate Washington, D.C. March 18, 2009 Natural Resources Defense Council,

This Committee should reject any broader attempt to use loan guarantees to recapitalize a technically mature industry, or to shift the overall terms of trade in the electricity marketplace in favor of nuclear power. This runs a serious risk of misdirecting investment capital away from commercialization of low-carbon energy technologies that are cheaper, cleaner, and more versatile than currently available nuclear power plants. Shifting the overall terms of energy commerce in favor of low-carbon solutions, nuclear power included, is the task of a climate bill, not the federal loan guarantee program. At best, federal loan guarantees should be construed as bridging the gap between successful prototype development and a foothold in the commercial marketplace, by spreading the risk of the initial capital investments required to bring a new technology to commercial scale.

But federal loan guarantees should not be abused to insulate an entire industry from competition with a host of new energy technologies that promise comprehensive environmental and social benefits. Unlike improvements in efficiency and renewable technologies, nuclear power is a decarbonization solution packaged with a host of noncarbon environmental, security, and waste problems. For these reasons, nuclear power should not be considered for inclusion in any “Renewable Electricity Standard” Congress may legislate.

In sum, the economically inefficient way to mitigate climate change is to broadly subsidize deployment of currently available nuclear power plant technologies. This will crowd out or slow investment in improved energy efficiency, utility-scale renewable electricity supply, and decentralized smart-grid technologies that can mitigate climate change in less time, with less cost and risk. If Congress is unwilling or unable politically to let a climate bill do the work of sorting out the most cost-effective low-carbon energy technologies, one possible way to mitigate economic inefficiency would be to closely couple any additional federal loan guarantees for nuclear with utility commitments to phase out existing coal capacity, such that future electricity demand growth in the affected service area or regional grid must be met in the first instance by large improvements in less costly energy efficiency, and by the development of renewable sources having environmental impacts and a marginal cost of generation less than nuclear power.

Only alternatives solve electricity price spikes and warming.

Madsen et al 9—Travis Madsen and Tony Dutzik of Frontier Group, Bernadette Del Chiaro and Rob Sargent of Environment America Research & Policy Center, Generating Failure, Environment America, November, <http://www.environmentamericacenter.org/sites/environment/files/reports/Generating-Failure---Environment-America---Web.pdf>

Choosing to Build New Reactors Would Divert Resources from More Cost Effective Strategies

Choosing to build new reactors would divert resources from more cost-effective strategies. Building 100 new nuclear reactors could have an up-front cost on the order of $600 billion (with a possible range of $250 billion to $1 trillion). 136 Investing this money in reactor deployment would foreclose opportunities to pursue cheaper and faster options.

New nuclear reactors would be far more costly than other forms of emission-free electricity. Even the most optimistic estimates for the average cost of power from a new nuclear reactor are 300 percent higher than the cost of energy efficiency or the cost of co-firing biomass in an existing power plant, and well above renewable technologies like wind power. Moreover, any new nuclear reactors won’t be operational until well into the next decade, whereas clean energy sources can be deployed now.

The cost advantages that clean energy has over nuclear power are likely to become even more pronounced over time, while we wait for the nuclear industry to finish its first new reactor. According to Moody’s Investor Service, “…nuclear generation has a fixed design where construction costs are rising rapidly, while other renewable technologies are still experiencing significant advancements in terms of energy conversion efficiency and cost reductions.” 137

Building 100 New Nuclear Reactors Would Divert Resources from Cheaper and More Effective Solutions

If both nuclear power and clean energy technologies such as renewable energy and energy efficiency improvements can reduce global warming pollution, why can’t we just pursue both paths – reducing emissions now through clean energy and in the future with nuclear? In a world of unlimited resources, such a path would be conceivable. But in the real world of public policy, governments must make choices about how to allocate limited resources. Moreover, to retain public support for efforts to reduce global warming pollution, government will need to demonstrate that it is acting in ways that minimize the costs of emission reductions and deliver the greatest benefit for the smallest expenditure. Recent estimates for the up-front cost of building a new nuclear reactor suggest that building 100 of them could require an up-front investment on the order of $600 billion. 138

However, the capital cost of a new nuclear plant is only part of the full story. Any up-front investment in nuclear power would lock in additional expenditures across decades. Once a plant is built, the price of the electricity it generates will reflect the ongoing need to pay off debt; the cost of operating and maintaining the plant; the cost of fueling the plant with uranium; the cost of decommissioning the plant and disposing of the waste; and the cost of transmitting and distributing the electricity to consumers. For 100 reactors, these costs would add up to additional trillions over a period of decades.

An investment in energy efficiency would deliver vastly superior results. Investing in energy efficiency actually pays us back with ongoing savings on electricity bills. Efficiency measures are almost always cheaper even than operating existing power plants. For example, analysts at the consulting firm McKinsey & Company estimate that investing $520 billion in energy efficiency measures would eliminate $1.2 trillion in waste from the U.S. economy, saving citizens and businesses nearly $700 billion (in net present value terms). 139 In other words, energy efficiency could provide the same level of impact as building 160 nuclear reactors in the next ten years – at net savings. 140

An investment in renewable sources of power can deliver carbon-free electricity for much less cost than nuclear power. Many types of renewable energy have the advantage of zero fuel costs, since wind and sunlight and the earth’s heat are free. Other types of clean energy, such as solar photovoltaic panels, have the advantage of being located near where the energy will be used, minimizing the cost of transmitting and distributing electricity. And these technologies require no special waste handling or decommissioning.

Compared to clean energy solutions, nuclear power is extremely expensive. The total extra cost to the U.S. economy of building 100 new nuclear reactors, above and beyond a least-cost clean energy approach, could fall in the range of $1.9 to $4.4 trillion over the entire lifetime of the reactors. 141

Cost Estimates for Nuclear Power Continue to Rise

In 2003, experts at the Massachusetts Institute of Technology and Harvard concluded that “today, nuclear power is not an economically competitive choice.” 142 The researchers predicted that without subsidies and financial support for the nuclear industry, “nuclear power faces stagnation and decline.” 143 The U.S. Congress responded by streamlining the permitting process at the Nuclear Regulatory Commission and authorizing billions in new subsidies through the 2005 Energy Policy Act. However, in 2009, the MIT researchers took another look at the nuclear industry and found that despite the new support, “increased deployment of nuclear power has been slow both in the United States and globally ….” 144

High costs are a major obstacle in the way of building new reactors. In the past decade, cost estimates for new nuclear power plants have only escalated.

In the early 2000s, nuclear industry executives estimated that construction costs for building a new nuclear reactor could approach $1,500 per kW of power generating capacity, plus finance costs. 145 They said the lower costs would make nuclear power competitive with coal and natural gas.

However, these early estimates have turned out to be overly optimistic. Recent estimates for the average cost of electricity from a new nuclear plant over its entire lifetime are four times higher than this initial projection that promoters of a “nuclear renaissance” put forward in the early part of the decade. 146

No nuclear companies have signed a contract guaranteeing a price for a new nuclear reactor. When Canada asked for guaranteed cost bids to build two new reactors, the results blew far past expectations. The only company willing to guarantee its work quoted a price of $26 billion to build two new reactors – or $10,800 per kW – more than seven times higher than cost estimates from early in the decade. 147 Areva offered its technology for $23 billion – or $7,400 per kW – but its bid was deemed non-compliant, likely because it would not guarantee the price. 148 Both of these quotes were more than double the threshold for competitiveness. 149

Nuclear Reactors Tend to Run Aground on Skyrocketing Construction Costs

High and escalating bids for new nuclear reactor projects should not be a surprise. Nuclear reactor construction projects in the U.S. have regularly run aground on skyrocketing construction costs. Of 75 nuclear reactors completed between 1966 and 1986, the average reactor cost more than triple its original construction budget. 150 Laterbuilt reactors came in as much as 1,200 percent over budget. 151

Economists commonly expect that new products and technologies become cheaper over time, as companies gain experience and develop economies of scale. However, in the case of the last generation of nuclear power in the United States, the opposite proved to be true. The first nuclear reactors ever built were among the least expensive, while costs spiraled wildly out of control in the final decades of reactor construction. (See Figure 8.) For plants beginning operation in the late 1970s and onward, inflation-adjusted capital costs escalated from just under $2,000 per kW to more than $10,000 per kW (in 2004 dollars). 152

Seen through the lens of history, nuclear industry predictions that new designs and modular construction techniques will bring costs down appear overconfident. 154 Developing new nuclear power plants will likely remain prone to high cost “surprises” and increased financial risk for power companies and their customers. 155 Due to the large amount of money required to build an individual reactor, the investment ratings firm Moody’s calls nuclear construction a “bet the farm risk” for a typical utility. 156

Nuclear Power Is More Costly than Other Forms of Emission-Free Electricity

Power from a new nuclear reactor would be more costly than other forms of emission-free electricity. Recent estimates for the average cost of electricity from a new nuclear power plant over its entire lifetime range from a low of 8 cents to a high of 30 cents per kilowatt-hour (kWh), with the bulk of estimates falling between 12 and 20 cents per kWh. 157 For many of these estimates, add another 2 cents per kWh to transmit and distribute the electricity from the nuclear plant to the customer.

Vast amounts of clean energy are available – now – at far less cost. 158

—Energy from a new nuclear reactor would be two to six times more expensive than saving electricity through efficiency – including utility and consumer investment. Across the country, the average utility cost of saved energy is 2.5 cents per kWh, three to four times cheaper than building any kind of new power plant. 159 Including consumer contributions to efficiency measures, the average total resource cost of efficiency is around 4.6 cents per kWh. 160 Analyses of future energy efficiency potential typically find vast available resources with average utility lifetime costs of around 4 cents per kWh in the residential sector and 2 cents per kWh or less in the commercial and industrial sectors. 161 Moreover, as the scale and scope of energy efficiency programs increase, they tend to become even more cost effective. 162

—Combined heat and power and recycled energy technologies are also extremely costeffective sources of electricity. Recycled energy technologies can generate electricity for about 3 cents per kWh. 163 Combined cycle industrial heat and power installations can generally produce power for 4.5 to 5.5 cents per kWh, including credit for the value of useful heat that the generators also produce. 164 And smaller building-scale CHP technology can deliver electricity for less than 6 cents per kWh, again counting the value of the useful heat also produced by the generator. 165

—Energy efficiency, distributed solar power, and combined heat and power have the added advantage of saving or generating energy near where it will be used, avoiding transmission and distribution costs. In addition, saving or generating energy locally minimizes electricity losses that can occur while transporting electricity from a distant power plant.

Large potential supplies of clean energy from wind, solar, biomass and geothermal sources are also available – now – at costs well below estimates for new nuclear power. For example:

—America’s entire electricity needs could be met by the wind blowing across the Great Plains or the sunlight falling on a 100 mile square patch of the desert Southwest, or a tiny fraction of the natural heat just beneath the surface of the earth anywhere across the country. 166 Diverse, locally-based resources are available in every state. Even the southeastern United States has enough biomass, wind, and lowimpact hydroelectric resources to meet 25 percent of its electricity needs within the next two decades. 167

— The U.S. Department of Energy (DOE) estimates that wind energy resources across the U.S. as a whole could produce more than 1.5 million GWh per year for between 6 and 10 cents per kWh (2006 dollars). 168 (This price includes estimated transmission costs, assuming that the existing grid has 10 percent spare capacity that could be used for wind, and that appropriate planning will allow new lines to be constructed as needed.) This amount of wind would be the energy equivalent of 190 nuclear reactors. 169 DOE estimates that generating 20 percent of America’s electricity supply with wind by 2030 would cost the average household just 50 cents per month more compared to sticking with coal- and gas-fired power – and excluding the benefits of cleaner air and conserved water. 170

—The California Public Utilities Commission estimates that in the western United States: 171

—Nearly 200,000 GWh per year of renewable electricity could be delivered locally for 9 cents per kWh or less;

—An additional 200,000 GWh per year of renewable electricity could be locally delivered at costs of 10 cents per kWh or less; and

—Well over 500,000 GWh per year of additional renewable electricity could be delivered locally at a cost of 12 cents per kWh or less.

Electricity from these renewable resources – the energy equivalent of more than 110 nuclear reactors – would be available at 8 to 12 cents per kWh delivered, half to two-thirds of a mid-range estimate for the cost of power from a new nuclear power plant. 172 Developing U.S. renewable energy and energy efficiency resources could save Americans more than $200 billion on energy bills by 2020. 173

Per Dollar Spent, Clean Energy Is More Effective at Preventing Pollution than New Nuclear Power

In at least the next six years, new nuclear power cannot be obtained in the United States at any price. However, many other energy technologies are available now that can deliver cost-effective reductions in pollution. Recent estimates for the cost of a new nuclear power plant place it well above many alternatives, including energy efficiency, combined heat and power, wind power (on land and off shore), biomass, landfill gas, geothermal, some types of solar thermal power and natural gas combined cycle power. 174

Research done for the California Energy Commission (CEC) in 2009 provides a relatively recent, apples-to-apples comparison of the estimated costs of different generation technologies with an in-service date of 2018, a decent guess as to when the first nuclear reactors might become available. 175 The estimates are partially specific to western states, and include the effects of some tax and incentive policies now authorized through that year (but not the renewable energy production tax credit, which is currently set to expire by 2013). These factors aside, the research gives a general idea of how generation technologies stack up. Many additional studies, using different starting assumptions, support the conclusion that energy efficiency and many forms of renewable power are expected to be substantially more cost-effective than nuclear power. 176

The CEC figures also exclude solutions like energy efficiency, biomass co-firing and combined heat and power, so this report draws on other sources to include them. Finally, this report does not consider possible intermediate solutions such as replacing coal-fired power with greater utilization of existing natural gas-fired power plants, which are also likely to be more cost-effective ways to prevent carbon emissions than building new nuclear plants.

In 2018, the CEC projects that new nuclear power will be more costly than most other forms of low emission electricity, whether financed by a public utility, an investor-owned utility, or a merchant generator. 177 Under investor-owned utility financing, per dollar spent (over the lifetime of the technology), energy efficiency would be five times more effective at preventing global warming pollution, and combined heat and power (in which a power plant generates both electricity and heat for a building or industrial application) would be greater than three times more effective. (See Figure 9.) Even without the benefit of the production tax credit in 2018, biomass, geothermal and land-based wind energy will be more than twice as effective, and offshore wind will be on the order of 40 percent more effective. Under merchant financing terms, nuclear fares even more poorly, with CEC expecting both solar thermal and solar photovoltaic power to be more cost-effective ways to reduce pollution.

By 2018, solar photovoltaic power should be comparable to a new nuclear reactor in terms of its per-dollar ability to prevent global warming pollution. However, solar power is falling in price far faster than any other generation technology. Solar prices have fallen by more than 80 percent since 1980. 179 And prices continue to decline as public policies encourage growth in capacity for solar panel manufacturing, distribution and installation. 180 Recent cost improvement is apparent in utility decisions to build nearly 1,000 MW of large-scale solar photovoltaic power plants in Florida and California – 10 times bigger than any now in service across the world. 181

In fact, recent analysis by the investment firm Lazard implies that thin-film solar photovoltaic and solar thermal power technologies, with existing incentives, are already competitive with and even ahead of nuclear power. 182 Lazard also highlights biomass co-firing – in which an existing coal-fired power plant replaces up to 15 percent of its typical fuel with plant matter – and landfill gas as additional cost-effective options. 183

The fact that clean energy is more cost-effective than new nuclear reactors is reflected in the conclusion of a recent report by the European Renewable Energy Council, the German Aerospace Center and Greenpeace, which shows that currently available clean energy technology could be deployed in the United States to deliver massive reductions in global warming pollution – at half the cost and with twice the job creation as an equivalent amount of nuclear and coal-fired power. Similarly, the non-profit Nuclear Policy Research Institute and the Institute for Energy and Environmental Research have published a report demonstrating how the United States can create an economy with zero emissions of global warming carbon dioxide pollution within 30 to 50 years at a reasonable cost, without nuclear power. 184

What Could an Equivalent Capital Investment in Clean Energy Achieve?

Investing $600 billion could potentially get us 100 new nuclear reactors by 2030. Alternatively, if we invested that money in clean energy solutions, we could get the double the impact, without the drag on the economy that the high cost of nuclear power would impose.

At an optimistic reactor cost forecast used by the Energy Information Administration of around $2,500 per kW of capacity (see page 22), building 100 new reactors would cost $250 billion up-front. Investing that same amount of capital in energy efficiency could reduce America’s electricity consumption by about 12 percent below the reference case by 2030. 185 This level of investment in energy efficiency would deliver emission reductions equal to building 100 new nuclear reactors by 2030, but unlike nuclear, pollution prevented through efficiency would come at net savings, since energy efficiency is so much more cost-effective than building new reactors.

At mid-range costs of around $6,500 per kW, near those forecast by Moody’s and comparable to recently proposed reactors, building 100 nuclear reactors would cost $650 billion. 186 Directing $590 billion of this capital investment to efficiency measures could capture a large fraction of America’s identified potential for electric energy efficiency, reducing electricity consumption by 25 percent below business as usual by 2030. The remaining money could purchase enough wind turbines and other renewable energy equipment to generate an additional 130 billion kWh by 2030. 187 Altogether, this package of clean energy would yield as much energy as more than 170 nuclear reactors in 2030. 188 This package of clean energy would reduce twice as much pollution as nuclear through 2030, with net savings on electricity costs – which nuclear power cannot offer.

High electricity prices collapse growth and competitiveness.

Bourne 11— Executive Director for the American Energy Freedom Center, Alexandra, American Energy Freedom: The Basis for Economic Recovery, Heritage Foundation, 5-31

Abstract: Electricity is the lifeblood of the U.S. economy—it is essential for all transportation, and for manufacturing all food and consumer products on which Americans rely every day. Many small businesses and families are still struggling to make ends meet during this fragile economic rebound, and the last thing they need is the rapidly increasing electricity, fuel, and food costs. Affordable energy is the key to lasting economic recovery, and a market-based energy policy is the best way to achieve it. An effective energy policy embraces and encourages the use of abundant and reliable domestic energy resources. Any energy policy that tightens supplies and raises prices will hurt everyone— but especially the lower and middle income—and needlessly prolong the economic misery. It is vitally important to thwart policy initiatives that raise energy prices, make American manufacturing uncompetitive, and send American jobs abroad.

Nuclear war.

Baru 9–Visiting Professor at the Lee Kuan Yew School of Public Policy in Singapore, Sanjaya, Geopolitical Implications of the Current Global Financial Crisis, Strategic Analysis, 33.2, p. 163-8

In the modern era, the idea that strong economic performance is the foundation of power was argued most persuasively by historian Paul Kennedy. ‘Victory (in war),’ Kennedy claimed, ‘has repeatedly gone to the side with more flourishing productive base.’6 Drawing attention to the interrelationships between economic wealth, technological innovation, and the ability of states to efficiently mobilize economic and technological resources for power projection and national defence, Kennedy argued that nations that were able to better combine military and economic strength scored over others.

‘The fact remains,’ Kennedy argued, ‘that all of the major shifts in the world’s military-power balance have followed alterations in the productive balances; and further, that the rising and falling of the various empires and states in the international system has been confirmed by the outcomes of the major Great Power wars, where victory has always gone to the side with the greatest material resources.’7

In Kennedy’s view the geopolitical consequences of an economic crisis or even decline would be transmitted through a nation’s inability to find adequate financial resources to simultaneously sustain economic growth and military power – the classic ‘guns vs butter’ dilemma.

Apart from such fiscal disempowerment of the state, economic under-performance would also reduce a nation’s attraction as a market, a source of capital and technology, and as a ‘knowledge power’. As power shifted from Europe to America, so did the knowledge base of the global economy. As China’s power rises, so does its profile as a ‘knowledge economy’.

Impressed by such arguments the China Academy of Social Sciences developed the concept of Comprehensive National Power (CNP) to get China’s political and military leadership to focus more clearly on economic and technological performance than on military power alone in its quest for Great Power status.8

While China’s impressive economic performance and the consequent rise in China’s global profile has forced strategic analysts to acknowledge this link, the recovery of the US economy in the 1990s had reduced the appeal of the Kennedy thesis in Washington DC. We must expect a revival of interest in Kennedy’s arguments in the current context.

A historian of power who took Kennedy seriously, Niall Ferguson, has helped keep the focus on the geopolitical implications of economic performance. In his masterly survey of the role of finance in the projection of state power, Ferguson defines the ‘square of power’ as the tax bureaucracy, the parliament, the national debt and the central bank. These four institutions of ‘fiscal empowerment’ of the state enable nations to project power by mobilizing and deploying financial resources to that end.9

Ferguson shows how vital sound economic management is to strategic policy and national power. More recently, Ferguson has been drawing a parallel between the role of debt and financial crises in the decline of the Ottoman and Soviet empires and that of the United States of America. In an early comment on the present financial crisis, Ferguson wrote:

‘We are indeed living through a global shift in the balance of power very similar to that which occurred in the 1870s. This is the story of how an over-extended empire sought to cope with an external debt crisis by selling off revenue streams to foreign investors. The empire that suffered these setbacks in the 1870s was the Ottoman empire. Today it is the US… It remains to be seen how quickly today’s financial shift will be followed by a comparable geopolitical shift in favour of the new export and energy empires of the east. Suffice to say that the historical analogy does not bode well for America’s quasi-imperial network of bases and allies across the Middle East and Asia. Debtor empires sooner or later have to do more than just sell shares to satisfy their creditors. …as in the 1870s the balance of financial power is shifting. Then, the move was from the ancient Oriental empires (not only the Ottoman but also the Persian and Chinese) to Western Europe. Today the shift is from the US – and other western financial centres – to the autocracies of the Middle East and East Asia.’10

An economic or financial crisis may not trigger the decline of an empire. It can certainly speed up a process already underway. In the case of the Soviet Union the financial crunch caused by the Afghan war came on top of years of economic under-performance and the loss of political legitimacy of the Soviet state. In a democratic society like the United States the political legitimacy of the state is constantly renewed through periodic elections. Thus, the election of Barack Obama may serve to renew the legitimacy of the state and by doing so enable the state to undertake measures that restore health to the economy. This the Soviet state was unable to do under Gorbachev even though he repudiated the Brezhnev legacy and distanced himself from it.

Hence, one must not become an economic determinist and historic parallels need not always be relevant. Politics can intervene and offer solutions. Political economy and politics, in the form of Keynesian economics and the ‘New Deal’, did intervene to influence the geopolitical implications of the Great Depression. Whether they will do so once again in today’s America remains to be seen.

Conventional wars are inevitable

Wilson, 2006

[Ward, former Fellow at the Robert Kennedy Memorial Foundation, “Rationale for a study of City Annihilations,”]

One of the characteristics of international crises is that they come seemingly out of the blue. The Kennedy Administration, in the fall of 1962, was focused on the coming midterm elections, not the almost inconceivable possibility that the Soviets would try to sneak nuclear missiles into Cuba. President Truman was vacationing in Independence, Missouri on June 24, 1950 when North Korean soldiers stormed across the 38th parallel. The words “Pearl Harbor” are synonymous in the US with being caught unawares. And so on.      Crises are made more unpredictable by the fact that they are not distributed regularly over time. Some decades are filled with them. Sometimes years go by without one. We have lived in a fortunate time. For fifty years no nation that possesses nuclear weapons has fought a war in which its national interests were seriously at risk. The wars fought in that time that have involved nuclear powers – Korea, Vietnam, the Chinese-Vietnam border war of 1979, the Soviet occupation of Afghanistan, the Falkland Islands, the Gulf War, the war against the Taliban in Afghanistan, the war in Iraq – have all been secondary or peripheral for the nuclear power involved. Some crises have had the potential to put national interests at stake (Berlin, Cuba) but fortunately the moment when potential became reality never arrived.      It would be foolish, however, to rely on luck in international affairs. If we wish to plan responsibly, we must assume that sometime in the future – perhaps sooner, perhaps later – there will be a crisis that puts a nuclear nation's vital interests at stake.

Resource competition, security enhancement, and nationalism make great power wars possible today

Mearsheimer, 99

John J., Professor of Political Science at the University of Chicago, February “Transcript: Is Major War Obsolete? Great Debate Series between Professor Michael Mandelbaum and Professor John J. Mearsheimer, Presider: Mr. Fareed Zakaria, http://http://www.ciaonet.org/conf/cfr10/conf/cfr10

Now I think the central claim that’s on the table is wrong-headed, and let me tell you why. First of all, there are a number of good reasons why great powers in the system will think seriously about going to war in the future, and I’ll give you three of them and try and illustrate some cases. First, states oftentimes compete for economic resources. Is it hard to imagine a situation where a reconstituted Russia gets into a war with the United States and the Persian Gulf over Gulf oil? I don’t think that’s implausible. Is it hard to imagine Japan and China getting into a war in the South China Sea over economic resources? I don’t find that hard to imagine. A second reason that states go to war which, of course, is dear to the heart of realists like me, and that’s to enhance their security. Take the United States out of Europe, put the Germans on their own; you got the Germans on one side and the Russians on the other, and in between a huge buffer zone called eastern or central Europe. Call it what you want. Is it impossible to imagine the Russians and the Germans getting into a fight over control of that vacuum? Highly likely, no, but feasible, for sure. Is it hard to imagine Japan and China getting into a war over the South China Sea, not for resource reasons but because Japanese sea-lines of communication run through there and a huge Chinese navy may threaten it? I don’t think it’s impossible to imagine that. What about nationalism, a third reason? China, fighting in the United States over Taiwan? You think that’s impossible? I don’t think that’s impossible. That’s a scenario that makes me very nervous. I can figure out all sorts of ways, none of which are highly likely, that the Chinese and the Americans end up shooting at each other. It doesn’t necessarily have to be World War III, but it is great-power war. Chinese and Russians fighting each other over Siberia? As many of you know, there are huge numbers of Chinese going into Siberia. You start mixing ethnic populations in most areas of the world outside the United States and it’s usually a prescription for big trouble. Again, not highly likely, but possible. I could go on and on, positing a lot of scenarios where great powers have good reasons to go to war against other great powers.

Off

Obama winning now – swing state polls

Bowen 9-20 (Robert, The Examiner, “New Fox News Poll Released Thursday Shows Obama Winning Three Key Swing States,” <http://www.examiner.com/article/new-fox-news-poll-released-thursday-shows-obama-winning-3-key-swing-states>)

Despite two re-set buttons, [Mitt Romney](http://www.examiner.com/topic/mitt-romney)’s campaign continues to back slide. The latest bad news comes from the [Fox News poll](http://www.foxnews.com/politics/2012/09/19/obama-has-edge-over-romney-in-three-battleground-states/#ixzz2719gIO00) for the crucial states of Ohio, Florida, and Virginia. The poll was released Thursday, and it is not good news for Romney. The results were confirmed by 3 other polls this week.¶ According to Fox News, [Obama](http://www.examiner.com/topic/obama) tops Romney by seven percentage points among likely voters in both Ohio (49-42 percent) and Virginia (50-43 percent). In Florida, the president holds a five-point edge (49-44 percent). Obama’s lead is just outside the poll’s margin of sampling error in Ohio and Virginia, and within the margin of sampling error in Florida. . The poll shows that majorities of voters are unhappy with how things are going in the country, yet in all three states more say they trust Obama than Romney to improve the economy. It was not asked in this poll, but in others, more voters still blame Bush and Republicans for the bad economy than Obama.¶ Likewise, in each state more voters believe the Obama administration’s policies have helped rather than hurt the economy although the margins are small. They favor Obama by two points in Florida, three points in Ohio, and five points in Virginia.

Government expenditure unpopular with public and congress

Kohut 12 (Andrew Kohut, president of Pew Research Center, “Debt and Deficit: A Public Opinion Dilemma,” Pew Research Center for the People and the Press, 6/14/12, <http://www.people-press.org/2012/06/14/debt-and-deficit-a-public-opinion-dilemma/>) NA

The issue of the debt and the deficit – and what to do about it – has paralyzed Washington lawmakers. But when it comes to measures for reducing the deficit on which they might reach common ground, they will get little help in building support for an agreement by turning to public opinion. In my years of polling, there has never been an issue such as the deficit on which there has been such a consensus among the public about its importance – and such a lack of agreement about acceptable solutions. When the public was asked in March to volunteer the most important problem facing the nation, only unemployment and the economy were cited more often. The deficit has also risen in importance in the public mind when Americans are asked at the beginning of each year what they believe to be the top national priorities for the president and the Congress. The Pew Research Center began measuring national priorities in 1997. Jobs, education, Social Security, Medicare and the budget deficit were at the top of the list then just as they are now, in 2012. The deficit had earlier slipped as a priority during the last years of the Clinton administration when the budget was in surplus and following the 9/11 attacks when terrorism rose as a priority. Today, however, the budget deficit stands out as one of the fastest growing priorities for Americans, rising 16 percentage points since 2007 and ranking third with 69% calling it a top priority. Only the economy and jobs, ranking first and second at 86% and 82% respectively, have registered bigger increases over this period – hardly surprising, given the financial meltdown that began in 2008 and whose impact is still being felt today.

Nuclear unpopular with the public – Fear of Chernobyl and Three Mile Island

Trembath 11 - Alex Trembath is a Policy Fellow in AEL’s New Energy Leaders Project, Nuclear Power in a Post-Partisan Approach to Energy, Americans for Energy Independence, 2-4-11, http://leadenergy.org/2011/02/the-nuclear-option-in-a-post-partisan-approach-on-energy/

In the wake of cap-and-trade’s defeat, and as we begin a new session of Congress, common ground must be found on policy to renovate America’s energy infrastructure. Now may be the time to explore the possible benefits of renewing America’s once vigorous nuclear power production. Notably absent in recent advances in America’s energy portfolio has been nuclear power. Public safety fears stemming from Chernobyl and Three Mile Island have left nuclear policy in stasis for decades, but as our President aims to launch a new industrial policy and our nation trends towards a new national energy policy, it may be time to revive our commitment to this method of zero-emissions baseload power generation. Nuclear power is unique among clean energy technologies in that Democrats tend to be more hesitant towards its production than Republicans. Indeed, it has a reputation for its appeal to conservatives -Senators Kerry, Graham and Lieberman included provisions for nuclear technology in their ultimately unsuccessful American Power Act (APA) with the ostensible goal of courting Republican support. The urgency with which Democrats feel we must spark an energy revolution may find a perfect partner with Republicans who support nuclear power. But is there anything more than speculative political evidence towards its bipartisan viability? If there is one field of the energy sector for which certainty of political will and government policy is essential, it is nuclear power. High up front costs for the private industry, extreme regulatory oversight and public wariness necessitate a committed government partner for private firms investing in nuclear technology. In a new report on the potential for a “nuclear renaissance,” Third Way references the failed cap-and-trade bill, delaying tactics in the House vis-a-vis EPA regulations on CO₂, and the recent election results to emphasize the difficult current political environment for advancing new nuclear policy. The report, “The Future of Nuclear Energy,” makes the case for political certainty: “It is difficult for energy producers and users to estimate the relative price for nuclear-generated energy compared to fossil fuel alternatives (e.g. natural gas)–an essential consideration in making the major capital investment decision necessary for new energy production that will be in place for decades.” Are our politicians willing to match the level of certainty that the nuclear industry demands? Lacking a suitable price on carbon that may have been achieved by a cap-and-trade bill removes one primary policy instrument for making nuclear power more cost-competitive with fossil fuels. The impetus on Congress, therefore, will be to shift from demand-side “pull” energy policies (that increase demand for clean tech by raising the price of dirty energy) to supply-side “push” policies, or industrial and innovation policies. Fortunately, there are signals from political and thought leaders that a package of policies may emerge to incentivize alternative energy sources that include nuclear power.

Romney crashes U.S.-Chinese relations

Osnos 9-21 (2012, Evan, The New Yorker, “The Chinese View of Obama and Romney,” <http://www.newyorker.com/online/blogs/evanosnos/2012/09/china-on-romney-and-obama.html>)

More surprising is that, for all of China’s frustration with the Obama Administration, it is even more chagrined by the turnaround in its relationship with Mitt Romney. [In an unusually pointed English commentary](http://in.reuters.com/article/2012/09/14/us-usa-campaign-romney-china-idINBRE88D09G20120914), China’s official Xinhua news service last week called Romney “foolish” and hypocritical, declaring: “It is rather ironic that a considerable portion of this China-battering politician’s wealth was actually obtained by doing business with Chinese companies before he entered politics.”¶ That was in response to [Romney’s pledge](http://www.google.com/hostednews/afp/article/ALeqM5iFaRVsPFxRdnakHtwHDghvvrRwhA?docId=CNG.fca805b1df739dff1339acedb5926c31.c1) last Thursday to declare China a currency manipulator.¶ “I also want to make sure that if a nation cheats like China has cheated, we call them on the carpet and don’t let it continue,” he told a crowd in Virginia. He accused the China of undervaluing its currency, which makes its products artificially cheaper and, he said, “drives American manufacturers and American producers out of business and kills jobs.” Xinhua was not amused:¶ Such blaming-China-on-everything remarks are as false as they are foolish, for it has been a myth that pushing up the value of China’s currency would be of little use to boost the chronically slack job market of the world’s sole superpower, not to mention to magically turn the poor U.S. economic performance around.¶ Much of this might be explained by hurt feelings. Quite simply, I can’t remember the last time an American politician has dropped more sharply in the Chinese estimation than Romney has over the course of this campaign. In fairness, he was set up to fulfill unfair expectations. According to Chinese political calculations, he was supposed to be their kind of guy: pro-business, Harvard-trained, Olympics-obsessed. If there was a word in Mandarin for clubbable, Chinese foreign-policy wonks would’ve used it. In the 2008 campaign, I noticed that the Chinese press was raving that he had demonstrated “[brilliant management ability](http://articles.chicagotribune.com/2008-01-21/news/0801200213_1_chinese-readers-toys-trade)” in his leadership of the Salt Lake City Olympics. The Chinese had also been pleased by his association with Bain Capital, which had been energetic in trying to assist Chinese companies buy American technology firms.

US-Sino Relations key to world economy and international stability – prerequisite to all impacts

Cohen 2009 (William S., and Greenberg, Maurice. Commission Cochairs of the Center for Strategic and International Studies. “Smart Power in US China Relations,” http://csis.org/files/media/csis/pubs/090309\_mcgiffert\_uschinasmartpower\_web.pdf)

The evolution of Sino-U.S. relations over the next months, years, and decades has the potential to have a greater impact on global security and prosperity than any other bilateral or multilateral arrangement. In this sense, many analysts consider the U.S.-China diplomatic relationship to be the most influential in the world. Without question, strong and stable U.S. alliances provide the foundation for the protection and promotion of U.S. and global interests. Yet within that broad framework, the trajectory of U.S.-China relations will determine the success, or failure, of efforts to address the toughest global challenges: global financial stability, energy security and climate change, nonproliferation, and terrorism, among other pressing issues. Shepherding that trajec­tory in the most constructive direction possible must therefore be a priority for Washington and Beijing. Virtually no major global challenge can be met without U.S.-China cooperation. The uncertainty of that future trajectory and the "strategic mistrust" between leaders in Wash­ington and Beijing necessarily concerns many experts and policymakers in both countries. Al­though some U.S. analysts see China as a strategic competitor—deliberately vying with the United States for energy resources, military superiority, and international political influence alike- analysis by the Center for Strategic and International Studies (CSIS) has generally found that China uses its soft power to pursue its own, largely economic, international agenda primarily to achieve its domestic objectives of economic growth and social stability.1 Although Beijing certainly has an eye on Washington, not all of its actions are undertaken as a counterpoint to the United States. In addition, CSIS research suggests that growing Chinese soft power in developing coun­tries may have influenced recent U.S. decisions to engage more actively and reinvest in soft-power tools that have atrophied during the past decade. To the extent that there exists a competition between the United States and China, therefore, it may be mobilizing both countries to strengthen their ability to solve global problems. To be sure, U.S. and Chinese policy decisions toward the respective other power will be de­termined in large part by the choices that leaders make about their own nation's interests at home and overseas, which in turn are shaped by their respective domestic contexts. Both parties must recognize—and accept—that the other will pursue a foreign policy approach that is in its own national interest. Yet, in a globalized world, challenges are increasingly transnational, and so too must be their solutions. As demonstrated by the rapid spread of SARS from China in 2003, pandemic flu can be spread rapidly through air and via international travel. Dust particulates from Asia settle in Lake Tahoe. An economic downturn in one country can and does trigger an economic slowdown in another. These challenges can no longer be addressed by either containment or isolation. What constitutes the national interest today necessarily encompasses a broader and more complex set of considerations than it did in the past. As a general principle, the United States seeks to promote its national interest while it simultane­ously pursues what the CSIS Commission on Smart Power called in its November 2007 report the "global good.": This approach is not always practical or achievable, of course. But neither is it pure benevolence. Instead, a strategic pursuit of the global good accrues concrete benefits for the United States (and others) in the form of building confidence, legitimacy, and political influence in key countries and regions around the world in ways that enable the United States to better con­front global and transnational challenges. In short, the global good comprises those things that all people and governments want but have traditionally not been able to attain in the absence of U.S. leadership. Despite historical, cultural, and political differences between the United States and China, Beijing's newfound ability, owing to its recent economic successes, to contribute to the global good is a matter for common ground between the two countries. Today there is increasing recognition that no major global challenge can be addressed effectively, much less resolved, without the active engagement of—and cooperation between—the United States and China.

Off

Text: The United States federal government should fully fund and support international cooperation on the research and deployment of atmospheric aerosol injection and carbon air capture and storage with the goal of stabilizing global climate change at pre-industrial levels by 2050. Support for international cooperation should include compensation for parties harmed by geoengineering.

Research funding causes a cooperative international expansion of geoengineering.

Brand 9—Lifetime environmentalist, President of the Long Now Foundation and author of the Whole Earth Catalog which won the National Book award in 1972, Stewart, Whole Earth Discipline, pg 294-5

Because the cost of some geoengineering schemes is so low, Victor predicts, "A lone Greenfinger, self-appointed protector of the planet and working with a small fraction of the Gates bank account, could force a lot of geoengineering on his own." The way to head off unilateral geoengi­neering and premature treaties, Victor suggests, is with a growing body of norms rather than rules:

Meaningful norms are not crafted from thin air. They can have effect if they make sense to pivotal players and when they become socialized through practice. . . . Useful norms could arise through an intensive process of research and assessment that is probably best organized by the academies of sciences in the few countries with the potential to geoengineer. . . .

Most likely . . . is that the impacts of global climate change will have reached such a nasty state by the time societies deploy large-scale geoengineering that some side effects will be tolerated. The . . . systems they deploy will not be a silver bullet but rather many interventions deployed in tandem—one to focus on the central disease and others to fix the ancillary harms.

To my mind, a useful role for Greenfinger entrepreneurs might be to jump-start serious geoengineering research while national academies of science are spending years making up their minds to act. Then the privately funded researchers could bring real data to the "transnational assessment process," where the norms and best practices emerge. This is a planetary hack we're talking about. It has to be totally transparent and highly collaborative. Everyone's first preference is to not deploy it at all, but if it has to be used, it must be done effectively and minimally, and if possible, for a limited period. Like abortion, geoengineering should be "safe, legal, and rare."

That still leaves the question of who runs things—"whose hands will be allowed on the thermostat," as David Victor puts it. The task can be divided between the operators and an oversight body. In one previous piece of planet craft—the total eradication of smallpox in the 1970s—the World Health Organization provided oversight and funding, and the Smallpox Eradication Unit, led by Donald Henderson, did the work.

In Victor's formulation, norms and leadership for geoengineering will emerge from an intensifying sequence of conferences, research projects, data sharing, and brainstorming. The most effective early players will determine the play, and funding will determine the pace. Geoengineering is government-scale infrastructure; it will need government-scale money. Once one nation commits, I suspect, other nations will join in, lest they be left out. If China says, "We're going to geoengineer," the United States, Russia, the European Union, Japan, Brazil, and India are not going to say, "Fine, let us know how it works out." They'll start their own programs. With luck, an ad hoc standards-setting body similar to the Internet Engi­neering Task Force ("rough consensus and running code") will emerge. That kind of governance was required in order to have one universal Inter­net. The planet's one universal climate requires something similar.

Geo-engineering solves warming.

Lenton and Vaughan 9—T . M. Lenton, School of Environmental Sciences, University of East Anglia, and N. E. Vaughan, Tyndall Centre for Climate Change Research, UK, The radiative forcing potential of different climate geoengineering options, Atmos. Chem. Phys., 9, 5539–5561, 2009

Abstract. Climate geoengineering proposals seek to rectify the Earth’s current and potential future radiative imbalance, either by reducing the absorption of incoming solar (shortwave) radiation, or by removing CO2 from the atmosphere and transferring it to long-lived reservoirs, thus increasing outgoing longwave radiation. A fundamental criterion for evaluating geoengineering options is their climate cooling effectiveness, which we quantify here in terms of radiative forcing potential. We use a simple analytical approach, based on energy balance considerations and pulse response functions for the decay of CO2 perturbations. This aids transparency compared to calculations with complex numerical models, but is not intended to be deﬁnitive. It allows us to compare the relative effectiveness of a range of proposals. We consider geoengineering options as additional to large reductions in CO2 emissions. By 2050, some land carbon cycle geoengineering options could be of comparable magnitude to mitigation “wedges”, but only stratospheric aerosol injections, albedo enhancement of marine stratocumulus clouds, or sunshades in space have the potential to cool the climate back toward its pre-industrial state. Strong mitigation, combined with global-scale air capture and storage, afforestation, and bio-char production, i.e. enhanced CO2 sinks, might be able to bring CO2 back to its pre-industrial level by 2100, thus removing the need for other geoengineering. Alternatively, strong mitigation stabilising CO2 at 500 ppm, combined with geoengineered increases in the albedo of marine stratiform clouds, grasslands, croplands and human settlements might achieve a patchy cancellation of radiative forcing. Ocean fertilisation options are only worthwhile if sustained on a millennial timescale and phosphorus addition may have greater long-term potential than iron or nitrogen fertilisation. Enhancing ocean upwelling or downwelling have trivial effects on any meaningful timescale. Our approach provides a common framework for the evaluation of climate geoengineering proposals, and our results should help inform the prioritisation of further research into them.

Case

Warming will be small.

Nature 12—Warming, but not as much, Nature 481, 413 (26 January 2012), http://www.nature.com/nature/journal/v481/n7382/full/481413e.html?WT.ec\_id=NATURE-20120126

The climate system may be less sensitive to greenhouse-gas warming than many models have predicted.

Nathan Gillett and his co-workers at Environment Canada in Victoria, British Columbia, analysed how well the latest Canadian Earth System Model tracked temperature changes attributable to volcanoes, man-made aerosols and rising greenhouse-gas emissions. They adjusted the model using temperature records from 1851 to 2010 — 60 years of data more than most previous analyses. The model predicted a short-term increase of 1.3–1.8 °C for a doubling of atmospheric carbon dioxide levels, which is low in the range of estimates from previous forecasts.

No impact to warming.

Stampf 7—Olaf Stampf, Not the End of the World as We Know It, Der Spiegel, 5-7, http://www.spiegel.de/international/germany/0,1518,481684,00.html

The truth is probably somewhere between these two extremes. Climate change will undoubtedly have losers -- but it will also have winners. There will be a reshuffling of climate zones on earth. And there is something else that we can already say with certainty: The end of the world isn't coming any time soon.

Largely unnoticed by the public, climate researchers are currently embroiled in their own struggle over who owns the truth. While some have always seen themselves as environmental activists aiming to shake humanity out of its complacency, others argue for a calmer and more rational approach to the unavoidable.

One member of the levelheaded camp is Hans von Storch, 57, a prominent climate researcher who is director of the Institute for Coastal Research at the GKSS Research Center in Geesthacht in northern Germany. "We have to take away people's fear of climate change," Storch told DER SPIEGEL in a recent interview. "Unfortunately many scientists see themselves too much as priests whose job it is to preach moralistic sermons to people."

Keeping a cool head is a good idea because, for one thing, we can no longer completely prevent climate change. No matter how much governments try to reduce carbon dioxide emissions, it will only be possible to limit the rise in global temperatures to about 2 degrees Celsius (3.6 degrees Fahrenheit) by the end of the century. But even this moderate warming would likely have far fewer apocalyptic consequences than many a prophet of doom would have us believe.

For one thing, the more paleontologists and geologists study the history of the earth's climate, the more clearly do they recognize just how much temperatures have fluctuated in both directions in the past. Even major fluctuations appear to be completely natural phenomena.

Additionally, some environmentalists doubt that the large-scale extinction of animals and plants some have predicted will in fact come about. "A warmer climate helps promote species diversity," says Munich zoologist Josef Reichholf.

Also, more detailed simulations have allowed climate researchers to paint a considerably less dire picture than in the past -- gone is the talk of giant storms, the melting of the Antarctic ice shield and flooding of major cities.

Improved regionalized models also show that climate change can bring not only drawbacks, but also significant benefits, especially in northern regions of the world where it has been too cold and uncomfortable for human activity to flourish in the past. However it is still a taboo to express this idea in public.

For example, countries like Canada and Russia can look forward to better harvests and a blossoming tourism industry, and the only distress the Scandinavians will face is the guilty conscience that could come with benefiting from global warming.

Palm Trees in Germany

There is no doubt that there will be droughts in other parts of the world, especially in subtropical regions. But the widespread assumption that it is developing countries -- that is, the world's poor -- who will, as always, be the ones to suffer is incorrect. According to current predictions, precipitation in large parts of Africa will hardly decrease at all, except in the southern part of the continent. In fact, these same forecasts show the Sahel, traditionally a region beset by drought and famine, actually becoming wetter.

By contrast, some wealthy industrialized nations -- in fact, those principally responsible for climate change -- will likely face growing problems related to drought. The world's new drought zones lie in the southern United States and Australia, but also in Mediterranean countries like Spain, Italy and Greece.

All of this will lead to a major shift within Europe, potentially leading to tough times for southern Spain's mega-resorts and boom times for hotels along the North Sea and Baltic Sea coasts. While the bulk of summer vacationers will eventually lose interest in roasting on Spain's Costa del Sol, Mediterranean conditions could prevail between the German North Sea island of Sylt and Bavaria's Lake Starnberg. The last few weeks of spring in Germany offered a taste of what's to come, as sun-loving crowds packed Berlin's urban beach bars and Munich's beer gardens.

The predicted temperature increase of 3 degrees Celsius would mean that summers in Hamburg, not far from the North Sea coast, would be as warm as they are today in the southwestern city of Freiburg, while conditions in Freiburg would be more like those in Marseille today. Germany will undoubtedly be one of the beneficiaries of climate change. Perhaps palm trees will be growing on the island of Helgoland in the North Sea soon, and German citizens will be saving billions in heating costs -- which in turn would lead to a reduction in CO2 emissions.

But climate change will also have its drawbacks. While German summers will be less rainy, fall and winter rainfall in the country's north will increase by up to 30 percent -- and snow will be a thing of the past. Heavy downpours will also become more common. To avoid flooding, steps will have to be taken to provide better drainage for fields and farmlands, as well as to restore natural flood plains.

Meanwhile, the Kiel Institute for World Economics warns that higher temperatures could mean thousands of heat-related deaths every year. But the extrapolations that lead to this dire prediction are based on the mortality rate in the unusually hot summer of 2003, for which Germans were wholly unprepared. But if hot summer days do become the norm, people will simply adjust by taking siestas and installing air-conditioning.

The medical benefits of higher average temperatures have also been ignored. According to Richard Tol, an environmental economist, "warming temperatures will mean that in 2050 there will be about 40,000 fewer deaths in Germany attributable to cold-related illnesses like the flu.”

Another widespread fear about global warming -- that it will cause super-storms that could devastate towns and villages with unprecedented fury -- also appears to be unfounded. Current long-term simulations, at any rate, do not suggest that such a trend will in fact materialize.

"According to our computer model, neither the number nor intensity of storms is increasing," says Jochem Marotzke, director of the Hamburg-based Max Planck Institute for Meteorology, one of the world's leading climate research centers. "Only the boundaries of low-pressure zones are changing slightly, meaning that weather is becoming more severe in Scandinavia and less so in the Mediterranean."

According to another persistent greenhouse legend, massive flooding will strike major coastal cities, raising horrific scenarios of New York, London and Shanghai sinking into the tide. However this horror story is a relic of the late 1980s, when climate simulations were far less precise than they are today. At the time, some experts believed that the Antarctic ice shield could melt, which would in fact lead to a dramatic 60-meter (197-foot) rise in sea levels. The nuclear industry quickly seized upon and publicized the scenario, which it recognized as an argument in favor of its emissions-free power plants.

But it quickly became apparent that the horrific tale of a melting South Pole was nothing but fiction. The average temperature in the Antarctic is -30 degrees Celsius. Humanity cannot possibly burn enough oil and coal to melt this giant block of ice. On the contrary, current climate models suggest that the Antarctic will even increase in mass: Global warming will cause more water to evaporate, and part of that moisture will fall as snow over Antarctica, causing the ice shield to grow. As a result, the total rise in sea levels would in fact be reduced by about 5 cm (2 inches).

It's a different story in the warmer regions surrounding the North Pole. According to an American study published last week, the Arctic could be melting even faster than previously assumed. But because the Arctic sea ice already floats in the water, its melting will have virtually no effect on sea levels.

'We Still Have Enough Time to React'

Nevertheless, sea levels will rise worldwide as higher temperatures cause the water in the oceans to expand. In addition, more water will flow into the ocean with the gradual thawing of the Greenland ice sheet. All things considered, however, in the current IPCC report climatologists are predicting a rise in sea levels of only about 40 centimeters (16 inches) -- compared with the previous estimate of about one meter (more than three feet). A 40-centimeter rise in sea levels will hardly result in more catastrophic flooding. "We have more computer models and better ones today, and the prognoses have become more precise as a result," explains Peter Lemke of the Alfred Wegener Institute for Polar and Marine Research in the northern German port city of Bremerhaven.

Some researchers do, however, estimate that regional effects could produce an 80-centimeter (31-inch) rise in the sea level along Germany's North Sea coast. This will lead to higher storm surges -- a problem the local population, already accustomed to severe weather, could easily address by building taller dikes.

Another comforting factor -- especially for poorer countries like Bangladesh -- is that none of these changes will happen overnight, but gradually over several decades. "We still have enough time to react," says Storch.

In short, the longer researchers allow their supercomputers to crunch the numbers, the more does the expected deluge dissipate. A rise in sea levels of several meters could only occur if Greenland were largely ice-free, but this is something scientists don't expect to happen for at least a few more centuries or even millennia. This lengthy timeframe raises the question of whether the current prognoses are even reliable.

Warming is inevitable.

Gelbspan 7— American writer and activist. He has written two books relating to global warming, Ross, It’s too late to stop climate change, argues Ross Gelbspan — so what do we do now?, Grist, 12-11, http://grist.org/article/beyond-the-point-of-no-return/

But even assuming the wildest possible success of their initiatives — that humanity decided tomorrow to replace its coal- and oil-burning energy sources with noncarbon sources — it would still be too late to avert major climate disruptions. No national energy infrastructure can be transformed within a decade.

All these initiatives address only one part of the coming reality. They recall the kind of frenzied scrambling that is characteristic of trauma victims — a frantic focus on other issues, any other issues — that allows people to avoid the central take-home message of the trauma: in this case, the overwhelming power of inflamed nature.

Within the last two years, a number of leading scientists — including Rajendra Pachauri, head of the Intergovernmental Panel on Climate Change (IPCC), British ecologist James Lovelock, and NASA scientist James Hansen — have all declared that humanity is about to pass or already has passed a “tipping point” in terms of global warming. The IPCC, which reflects the findings of more than 2,000 scientists from over 100 countries, recently stated that it is “very unlikely” that we will avoid the coming era of “dangerous climate change.”

Plan eliminates aerosols—causes faster warming.

Lovelock 9—Consultant of NASA, former president of the [Marine Biological Association](http://en.wikipedia.org/wiki/Marine_Biological_Association), and  Honorary Visiting Fellow of [Green Templeton College, Oxford](http://en.wikipedia.org/wiki/Green_Templeton_College,_Oxford), James, The Vanishing Face of Gaia: A Final Warning: Enjoy it While You Can, 55-56

In 2004 two IPCC contributors, Peter Cox and Meinrat Andreae, raised the question: What happens to global warming if this pollution haze suddenly disappears? Their paper in Nature warned that if the haze disappeared, global heating would intensify, and dangerous change could be the consequence. In 2008, a group led by Peter Stott, from the Hadley Centre (part of the Meteorological Office), examined this phenomenon in a careful and well-drawn paper in the jour­nal Tellus: "global dimming," they revealed, is complex, even as a purely geophysical problem. According to their calculations the sudden removal of haze could lead to ei­ther a modest or a severe increase of heating. I now begin to see why my wise friend Robert Charlson is so loath to commit himself on pollution aerosols and climate change. Even so, there was little doubt among any of these distin­guished climate scientists that the present pollution haze reduces global heating, or that its sudden removal could have serious consequences. I suspect that we worry less about global heating than about a global economic crash, and forget that we could make both events happen together if we implemented an immediate, global 6o percent reduction of emissions. This would cause a rapid fall in fossil fuel consumption, and most of the particles that make the atmospheric aerosol would within weeks fall from the air. This would greatly simplify prediction and we could at last be fairly sure that global temperature would rise; the removal of the pollution aerosol would leave the gaseous greenhouse unobstructed and free at last to devastate what was left of the comfortable interglacial Earth. Yes, if we imple­mented in full the recommendations made at Bali within a year, far from stabilizing the climate, it could grow hot­ter not cooler. This is why I said in The Revenge of Gaia, "We live in a fool's climate and are damned whatever we do."

Species loss has no impact and is slow.

Sagoff 97 – U Maryland School of Public Affairs Institute for Philosophy and Public policy Senior Research Scholar, Mark, “INSTITUTE OF BILL OF RIGHTS LAW SYMPOSIUM DEFINING TAKINGS: PRIVATE PROPERTY AND THE FUTURE OF GOVERNMENT REGULATION: MUDDLE OR MUDDLE THROUGH? TAKINGS JURISPRUDENCE MEETS THE ENDANGERED SPECIES ACT”, 38 Wm and Mary L. Rev. 825, Lexis

Somewhat fewer than 1,000 domestic species are listed as endangered, and roughly one third that number or more are considered threatened or in jeopardy. n335 In biodiversity-rich California, the problem is particularly troubling. About one third of the species in jeopardy in the United States reside in California, and of these approximately 125 are listed as endangered. n336 Although these grim statistics should appall us for ethical reasons, we may wonder if the extinction of hundreds of species in California and thousands nationwide will cause any harm to human welfare. If any of these extinct species had a known economic use, for example, as crops, we would be able to judge the value of the species in terms of its market price. As a rule, creatures that have a direct economic use, such as crops, have habitats created for them (e.g., farms) rather than taken from them. The economic benefits, if any, that flow from endangered species are indirect and not likely to fetch a market price. To estimate the economic value of such an endangered species we must determine its worth "at the margin," in other words, in relation to the cost of obtaining the least expensive substitute species that performs the same function or service. Suppose, for example, that the American burying beetle, a marvelous but endangered creature, n337 functions in the ecosystem by decomposing the corpses of small animals. We would ask to what expense we must go to find a different kind of beetle or some other animal ready, willing, and able to do the same work of decomposing [\*904] small corpses. Nothing can be assessed economically except at the margin, that is, in relation to the price of substitutes. "Healthy ecosystems carry out a diverse array of processes that provide both goods and services to humanity," observed the Ecological Society of America in a recent report. n338 Ecosystem services, according to the report, include: "Maintaining hydrological cycles[;] [r]egulating climate; [c]leansing water and air; [m]aintaining the gaseous composition of the atmosphere; [p]ollinating crops and other important plants[;] [g]enerating and maintaining soils[;] [s]toring and cycling essential nutrients; [a]bsorbing and detoxifying pollutants[;] [and] [p]roviding beauty, inspiration, and research[.]" n339 For one reason or another, no extinction of any species in the United States seems thus far to have altered the capacity of the ecosystems to provide these services. The reason may be that for any species that is lost, tens, hundreds, or thousands of others are ready, willing, and able to perform the same functions and services valuable to human beings. Perhaps twenty species of birds have vanished in the United States since 1492; of those, fifteen have vanished in Hawaii. n340 What specific losses in ecosystem services, such as those listed above, have occurred as a result? Mammals that have become extinct include Goof's pocket gopher, Shaman's pocket gopher, and the Tacoma pocket gopher-all of which disappeared this century. "The loss of a species from a particular area may have little or no net effect on the ability of the ecosystem to perform its ecological processes if competitors take the species' place." n341 Has any ecosystem service diminished owing to the loss of these gophers? Or have other species, including many other kinds of gophers, simply taken their place? [\*905] To be sure, if extinctions continue at present rates indefinitely, at some point there may be too few viable species ready, willing, and able to substitute for those that have been lost. How much of a "buffer" exists? How many "extra" rivets are in the wings? Many ecologists follow Paul Ehrlich, Peter Raven, and others in declaring that with every extinction we run the risk of calamitous damage to the environment. n342 Although one may agree with ecologists such as Ehrlich and Raven that the earth stands on the brink of an episode of massive extinction, it may not follow from this grim fact that human beings will suffer as a result. On the contrary, skeptics such as science writer Colin Tudge have challenged biologists to explain why we need more than a tenth of the 10 to 100 million species that grace the earth. Noting that "cultivated systems often out-produce wild systems by 100-fold or more," Tudge declared that "the argument that humans need the variety of other species is, when you think about it, a theological one." n343 Tudge observed that "the elimination of all but a tiny minority of our fellow creatures does not affect the material well-being of humans one iota." n344 This skeptic challenged ecologists to list more than 10,000 species (other than unthreatened microbes) that are essential to ecosystem productivity or functioning. n345 "The human species could survive just as well if 99.9% of our fellow creatures went extinct, provided only that we retained the appropriate 0.1% that we need." n346

Biodiversity not key to agriculture.

Sagoff 97 – U Maryland School of Public Affairs Institute for Philosophy and Public policy Senior Research Scholar, Mark, “INSTITUTE OF BILL OF RIGHTS LAW SYMPOSIUM DEFINING TAKINGS: PRIVATE PROPERTY AND THE FUTURE OF GOVERNMENT REGULATION: MUDDLE OR MUDDLE THROUGH? TAKINGS JURISPRUDENCE MEETS THE ENDANGERED SPECIES ACT”, 38 Wm and Mary L. Rev. 825, Lexis

What about the use of plants and animals in agriculture? There is no scarcity foreseeable. "Of an estimated 80,000 types of plants [we] know to be edible," a U.S. Department of the Interior document says, "only about 150 are extensively cultivated." n363 About twenty species, not one of which is endangered, provide ninety percent of the food the world takes from plants. n364 Any new food has to take "shelf space" or "market share" from one that is now produced. Corporations also find it difficult to create demand for a new product; for example, people are not inclined to eat paw-paws, even though they are delicious. It is hard enough to get people to eat their broccoli and lima beans. It is harder still to develop consumer demand for new foods. This may be the reason the Kraft Corporation does not prospect in remote places for rare and unusual plants and animals to add to the world's diet. Of the roughly 235,000 flowering plants and 325,000 nonflowering plants (including mosses, lichens, and seaweeds) available, farmers ignore virtually all of them in favor of a very few that are profitable. n365 To be sure, any of the more than 600,000 species of plants could have an application in agriculture, but would they be preferable to the species that are now dominant? Has anyone found any consumer demand for any of these half-million or more plants to replace rice or wheat in the human diet? There are reasons that farmers cultivate rice, wheat, and corn rather than, say, Furbish's lousewort. There are many kinds of louseworts, so named because these weeds were thought to cause lice in sheep. How many does agriculture really require? [\*911] The species on which agriculture relies are domesticated, not naturally occurring; they are developed by artificial not natural selection; they might not be able to survive in the wild. n366

Oceans resilient – they can’t kill off the microbes key to ecosystem functions.

Kunzig 7 – Award Winning Scientific Journalist Specializing in Oceans, Robert, Sweeping The Ocean Floor, Discover, Vol. 28

For all its unplumbed depths, the ocean is a rather simple machine. Light from the sun comes in at the top. Nutrients, primarily nitrogen and phosphorus, are brought from the land by rivers and are stirred up from the bottom mud by upwelling currents. Floating single-celled plants, the phytoplankton, take the sunlight and the nutrients and combine them with carbon dioxide to make organic matter. The single-celled plants are eaten by Zooplankton, which are then eaten by larger things, and so on, up to the familiar tuna and nurse sharks and gray whales. Floating in the water among all these things are myriad bacteria — there are perhaps a billion cells in every liter. These bacteria degrade dead plankton and fish excrement, recycling the carbon, nitrogen, phosphorus, and other elements back into the water. Census scientists estimate that more than 90 percent of the 145 billion tons of life in the sea consists of microbes, either phytoplankton or bacteria. Some of the dead matter escapes the degrading microbes and sinks into the deeper, darker layers of the ocean. On the way down, it nourishes another population of animals — some fish, but also a huge array of gooey gelatinous things, known to their few scientific friends as jellies. Jellyfish proper, the medusae, are just one kind. They are familiar because they often venture into the shallows where humans paddle about. There are also the ctenophores, or comb jellies, with their eight rows of tiny rippling paddles; cylindrical salps that swim by jet propulsion; and floating snails that catch their food by casting large nets of mucus. Many of these animals are able to light up like fireflies — whether to scare off predators or attract a mate is not entirely clear. Descending in a submersible from the sunlit surface waters into the deep and utter dark of the abyss, one sees these bioluminescent flickers, like flashbulbs in a darkened concert hall. Then there is the bottom. The seafloor is not a single place; its topography is every bit as varied as that of dry land. A rugged chain of volcanic mountains, the midocean ridge, runs down the center of the Atlantic, around Africa into the Indian Ocean, between Australia and Antarctica, and across the South Pacific, then up the East Pacific to California, where it becomes the San Andreas Fault. The ridge rises as high as 15,000 feet above the surrounding abyssal plains. Here and there, those hilly plains are interrupted by underwater mountains called seamounts. In certain places along the rim of the oceans, especially the Pacific Rim, the seafloor descends abruptly into deep trenches. The most extreme, the Mariana Trench near the Philippines, plunges nearly seven miles, far deeper than Everest is tall. In 1960 Swiss explorer Jacques Piccard and American Navy lieutenant Don Walsh landed on its bottom in a primitive submarine, the Trieste, and looked out their tiny porthole for a few minutes. They saw a fish, or maybe it was a sea cucumber. There is life everywhere in the ocean, on every patch of ground, in every ounce of water. The deep seafloor is perfectly dark — sunlight is completely extinguished at a depth of 3,000 feet — and so it has no plants. Life there is sustained by the intermittent rain of dead organic matter from the surface waters. In places like the North Atlantic, where plankton bloom lushly in the spring, oceanographers find patches of green stuff on the ocean bed, a mile or two below. Sea cucumbers, one of the most common deep-sea animals, crawl through the stuff and vacuum it up. When a fish corpse reaches the bottom, every bit of flesh and bone is slowly scavenged by eel-like hagfish, starfish, and swarms of tiny crustaceans called amphipods. Even where the food is not so rich, the seafloor is not lifeless; everywhere it is churned by bristle worms and nematodes and pill-bug-like isopods. Life at the bottom may be sparse, but it is thorough. Every particle of mud passes through a worm gut several times at least. For more than a century, after deep-sea studies got going in earnest in the 1870s with the round-the-world expedition of the British ship Challenger, biologists thought that was all there was to it. Then in 1977, two geochemists — Jack Cortiss and John Edmond, diving in the submersible Alvin — discovered the first hydrothermal vent, or volcanic hot spring, on the ocean floor. They saw an astonishing scene around the vent. Clustered there, on the midocean ridge near the Galapagos Islands, were giant clams and mussels and six-foot-long tube worms, anchored to the ground and sticking upright. The tubes were white as ivory, with scarlet plumes at their tips that retracted as the sub approached. None of these species had ever been documented before. The strange organisms of the Galapagos rift turned out to be a whole new type of ecosystem. The base of their food chain was not plants that captured the energy of the sun but chemosynthetic bacteria that captured the energy of the volcano. Similar hydrothermal vent communities were eventually found at dozens of other points on the midocean ridge. Biologists, including some who had never thought much about the deep before, descended on them with fascination — and relief. It didn't take much work to convince the public and the funding agencies that these weird beasts were worth studying, so out-of-reach money suddenly became available. But in the ensuing rush, it was easy to forget that there was still a vast, cold, unknown ocean out there. Fred Grassle never forgot He had been one of the first scientists to get a good look at the Galapagos hot springs. A biologist from Rutgers University in New Jersey specializing in polychaetes — tiny caterpillar-like things, also known as bristle worms — he found himself staring out Alvin's porthole at tube worms almost as tall as he was. He was as amazed as anyone, but he soon went back to the larger problem of studying all the rest of the ocean. In the 1980s, he and his colleague Nancy Maciolek of Battelle Ocean Sciences in Massachusetts used a simple device called a box corer to collect undisturbed square-foot samples of seafloor mud. Judging from how many new species they found each time they lowered their device 7,000 feet onto the continental slope off New Jersey, Grassle and Maciolek estimated that there were up to 10 million animal species living on the ocean floor. If so, the deep was as diverse as the tropical rain forest. Grassle tried hard to get people excited about his work. He did not have much luck until he went to see Jesse Ausubel, who calls himself an environmental scientist and systems analyst but whose real talent is that he is a big-picture man, an organizer, and a congenital optimist. Early in his career he began studying environmental problems. "I'm going to be doing this for 40 years," he decided, "and I don't want to just go around saying Terrible things could happen.'" Terrible things are in fact happening to the ocean, as Grassle told Ausubel when they met. It was July 2, 1996, and they spent most of the day together in Woods Hole, Massachusetts, where Grassle had once worked at the Oceanographic Institution and where Ausubel has a summer office. A hundred miles to the east, on Georges Bank, the codfish stock had recently collapsed, as had the much larger one on the Grand Banks off Newfoundland; regulators had been forced to close both of those rich and historic fisheries. The amount we know about the marine species we depend on, Grassle told Ausubel, is minimal. The amount we don't know about the rest of the ocean, on the other hand, is astronomical. Ausubel took that as a challenge. The Sloan Foundation had recently sponsored a Digital Sky Survey — a systematic census of the stars. What did Grassle think, Ausubel asked, about doing a census of the fishes? Grassle thought it was a splendid idea, as long as it didn't get diverted into something strictly utilitarian — a census of seafood — and as long as it included all the other things that lived in the ocean, including obscure but biologically important organisms like polychaetes. The Census of Marine Life was born in 2000. "It is what it says it is," Ausubel says. "If you pick up any textbook, there isn't one that can tell you what lives in the ocean. From microbes to mammals, from near the shore to the open ocean, from the bottom to the top — what lives there. It's a very simple idea." Finding out what lives there doesn't just mean finding new species; it also means tracking the species we already know to find out where they go. Even highly visible marine animals lead invisible lives, far from shore or underwater or both. Stanford University biologist Barbara Block and her colleagues on a census project called Tagging of Pacific Pelagics are using microchips and satellite transmitters to penetrate those secrets. So far the researchers have tagged 2,400 animals belonging to 23 species. Some tags pop to the surface at a preset time, like a flare, and radio the animal's position back to the team via satellite. Other animals — sharks, elephant seals, whales, leatherback turtles — are equipped with tags that phone home each time the creatures surface. The tracking project's Web site contains a map of those animals' movements, a tangled mesh of colored lines that is updated daily. Such maps have revealed astonishing migrations. Bluefin tuna born in the Mediterranean cross the Atlantic to feed for a few years up and down the east coast of North America, mingling there with bluefins born in the Gulf of Mexico. Bluefins in the Pacific, on the other hand, feed off California for a few years before crossing the ocean to their breeding grounds off Japan — where a single one can fetch $175,000 on the Tokyo market. And white sharks, once thought to spend most of their time hunting seals and surfers off the California coast, actually head west in winter, to the open sea. For a few months, the sharks hang out in a patch of ocean near Hawaii that is low on food and any other obvious attraction. "My students call it the White Shark Café," Block says. But most of the ocean's diversity probably isn't hiding; it is teeming everywhere, undiscovered simply because it is so small. That is why Mitchell Sogin of the Marine Biological Laboratory in Woods Hole is directing the Census of Marine Microbes. The old way to search for microbial life in the ocean, he explains, was to isolate individual species by growing them in laboratory cultures. Biologists have identified around 5,000 species that way. But over the past 15 years or so, researchers have begun to realize that those 5,000 are just the hardy few that happen to be easy to keep alive in the lab. A newer, far less selective way of plumbing the ocean's microscopic diversity is to isolate individual genes, not individual microbes. Researchers use a small piece of the gene for ribosomal RNA, or rRNA — a gene that is distinct in every species — to grab all the rRNA genes that are present in a liter of seawater. Then they determine the sequence of as many of those genes as their grant money will, allow — typically around a thousand, coming from a thousand bacterial cells — and use that information to estimate how many different kinds of bacteria are present in the sample. Sogin is now supercharging this approach. By using faster sequencing machines and targeting only one highly variable part of the rRNA gene, he and his team can sequence 200,000 pieces of DNA from a single liter. As a result, the amount of diversity they find has soared. In one sample from the deep North Atlantic Ocean, they have found more than 60,000 kinds of bacteria. One intriguing discovery, Sogin says, is that in each sample he has studied so far there are always a few dominant kinds of microbes but also thousands more that are rare. Moreover, at each station — or even at different depths at the same station — there is a different suite of rare microbes. The large number of rare microbial species suggests that they have an important role in the oceanic ecosystem. Sogin suggests these rare species might function as a genetic archive, a fail-safe against environmental disaster. Over many millions of years, he explains, Earth has undergone repeated environmental cataclysms. "Global warming, asteroid impact, or whatever it is — those events threaten the survival of the microorganisms. This might be a way for them to cope," Sogin says. If there are tens of thousands of rare microbes floating in the water, all with different genes and correspondingly different abilities, there will always be a few that are adapted to the new environment. The dominant might become rare, the rare might become dominant, but the kingdom as a whole persists, albeit with an altered mix of species, which in turn alters the elemental cycles that determine the basic life chemistry of the sea.

Diseases not a threat.

Posner, Federal Judge and Senior Lecturer at U Chicago Law, 2005

Richard, Catastrophe: the dozen most significant catastrophic risks and what we can do about them, Skeptic, 1-1, http://goliath.ecnext.com/coms2/gi\_0199-4150331/Catastrophe-the-dozen-most-significant.html

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.

1nc—No Expansion

No shot of nuclear expansion—it’s uneconomic.

Taylor 8—Fellow @ Cato, Jerry, Nuclear Energy: Risky Business, Cato Institute, 10-22, http://www.cato.org/publications/commentary/nuclear-energy-risky-business

Nuclear energy is to the Right what solar energy is to the Left: Religious devotion in practice, a wonderful technology in theory, but an economic white elephant in fact (some crossovers on both sides notwithstanding). When the day comes that the electricity from solar or nuclear power plants is worth more than the costs associated with generating it, I will be as happy as the next Greenpeace member (in the case of the former) or MIT graduate (in the case of the latter) to support either technology. But that day is not on the horizon and government policies can't accelerate the economic clock.

Many free market advocates support nuclear because it costs less to generate nuclear power than it does to generate electricity from any other source (save, perhaps, hydroelectric power), thanks to nuclear's low operation and maintenance costs. However, someone has to first pay for-and build-these plants and the rub is that nuclear has very high, upfront construction costs ranging from $6-9 billion. By contrast, gas plants cost only a few hundred million dollars to build and coal a couple of billion depending upon the capacity and type of plant.

This raises the opportunity and risk costs of nuclear, making it unattractive to investors. Capital-intensive power facilities take longer to build, which means that investors have to defer returns for longer than if they had invested elsewhere. What's more, electricity markets have a very peculiar pricing mechanism that makes it harder for nuclear to maximize returns compared to gas-powered or other plants. In essence, there are two electricity markets: a market for base-load power (electricity sold 24-hours a day) and a market for peak power (electricity sold as needed during peak demand periods like hot summer days). Much of the demand for new power-and thus much of the profit available to investors today-is found in the peak market. But nuclear power plant construction costs are so high that it would take a very, very long time for nuclear facilities to pay for themselves if they only operated during high demand periods. Hence, nuclear power plants are only profitable in base-load markets. Gas-fired power plants, on the other hand, can be profitable in either market because not only are their upfront costs low but it is much easier to turn them off or on unlike nuclear.

Nuclear's high up-front costs don't just mean delayed profits, it also makes nuclear a more risky investment, especially since 20 states have scrapped policies that used to allow investors to charge rates that would guarantee their money back. This means that investors in new nuclear power plants are making a multi-billion dollar bet on disciplined construction schedules, accurate cost estimates, and the future economic health of the region. Bet wrong on any of the above and the company may well go bankrupt. Bet wrong on a gas-fired power plant, on the other hand, and corporate life will go on because there is less to lose given that the construction costs associated with gas-fired power plants are a small fraction of those associated with nuclear plants.

One metric that reflects this difference is the "levelized" cost-the price that must be received by owners to cover fixed and variable costs while returning profits to investors. This cost is substantially higher for nuclear than coal-fired electricity. Tufts economist Gilbert Metcalf, for instance, has calculated that, under current law, the levelized cost of nuclear power in the United States is 4.31¢ per kilowatt hour (kWh). Coal-fired electricity, on the other hand, cost 3.53¢ per kWh and "clean" coal cost 3.55¢.

But even these nuclear estimates are almost certainly too low. That's because Metcalf uses an "overnight cost" (construction costs minus financing costs) figure of $2,014 per installed kilowatt (kW) which is much too low. The Energy Information Administration (EIA) puts this cost at $2,475 per kW at present-although even this figure is suspicious because it relies on a world-wide average for nuclear power plant construction-including the grossly unreliable estimates from state-managed economies. The Standard & Poor's overnight cost estimate of $4,000 is likely the most reliable because it is based on nuclear plant construction costs in economies where labor and material costs are very similar to those found in the United States. Industry analyst Jim Harding, who uses overnight cost figures similar to Standard & Poor's, puts the levelized costs for new nuclear power generation at 12-15c per kWh right now.

Investors are also wary of nuclear plants because of the construction delays and cost over-runs that have historically plagued the industry. For instance, the Areva/Siemens nuclear power plant being built for TVO in Finland-the first nuclear power plant to be built in a relatively free energy market in decades-once scheduled to be operational within 54 months, is now two years behind schedule and 60% over budget. Nor have these construction delays had anything to do with regulatory obstruction or organized public opposition.

Nuclear can’t solve warming.

Ferguson 7— fellow for science and technology at the Council on Foreign Relations. He is also an adjunct assistant professor in the School of Foreign Service at Georgetown University and an adjunct lecturer at the Johns Hopkins University, Charles, Nuclear Energy: Balancing Benefits and Risks, Council on Foreign Relations, April

Nuclear energy provides about 16 percent of the globe’s electricity. In comparison, fossil fuels, which contribute to global warming through emissions of greenhouse gases, generate about 66 percent of the world’s electricity. Global electricity demand is projected to double by 2030 and triple by 2050, based on business-as-usual usage. Much of this demand growth will occur in the developing world. Decisions leaders make today about where to invest in various energy sourceswill have a lasting effect because the life of most power plants extends beyond forty years.

How much could global nuclear energy consumption grow over the next four decades? A 2003 Massachusetts Institute of Technology study posited a base growth scenario of one thousand gigawatts of nuclear capacity by 2050. 5 (A one-gigawatt nuclear reactor can power a U.S. city containing about a half-million people, comparable to the size of Washington, DC.) In comparison, today the world has about370 gigawatts of installed nuclear capacity. The almost threefold increase in nuclear power by 2050 would only increase the global proportion of nuclear energy use from 16 percent to about 20 percent because of the projected increased demands for electricity. As a consequence, this modest increase in contribution from nuclear energy alone would not decrease the emissions of greenhouse gases. In the absence of regulating carbon, reducing energy demand, and expanding no- and low-carbon energy sources, those emissions would increase because of greater use of fossil fuels to meet the projected demand for electricity as well as heating and transportation fuels.

How much nuclear energy would be needed to maintain global carbon dioxide emissions at the year 2000 level? Reaching this goal might head off many of the damaging consequences of climate change. The Institute for Energyand Environmental Research (IEER) has recently estimated that this scenario would require between 1,900 and 3,300 gigawatts of nuclear capacity depending on differing projections of alternative energy usage and adoption of energy efficiencies. 6 Under this very ambitious scenario, each new reactor would have to come online at a rate of less than one per week over the next four decades. As a practical matter, building reactors at this rapid pace would initially tend to drive up unit costs and, thus, scare off investors. For example, there are currently only a few companies in the world that can make reactor-quality steel, concrete, and other vital parts. Moreover, a rush to build would aggravate existing shortages of skilled workers to construct the reactors, qualified engineers to run the power plants, and inspectors to ensure safe operations.

That destroys environmental leadership—key to solve warming.

Madsen et al 9—Travis Madsen and Tony Dutzik Frontier Group Bernadette Del Chiaro and Rob Sargent Environment America Research & Policy Center, Generating Failure, Environment America, November, <http://www.environmentamericacenter.org/sites/environment/files/reports/Generating-Failure---Environment-America---Web.pdf>

Quick Action Through Clean Energy Can Demonstrate International Leadership

If the United States chooses nuclear power as its primary strategy to reduce emissions of global warming pollution, it is likely that the nation would have little or nothing to show for it in terms of real emission reductions from the electric power sector in the next 10 years. The failure of the United States to demonstrate real emission reductions would erode U.S. leadership in addressing global warming and likely reduce the international community’s appetite for action. We need other countries across the world to act rapidly and forcefully alongside the United States in order to have a chance at limiting global warming to 3.6°F above the pre-industrial era – thus controlling the severity of global warming impacts.

Showing a commitment to urgent action by adopting a clean energy path, however, could demonstrate more U.S. leadership, bringing the international community closer to achieving an ambitious, binding and firm agreement to fight global warming. Urgent action to deploy clean energy can also help America take a leadership role in building a clean technology and clean energy economy. 135

Environmental leadership solves extinction.

Khosla 9—IUCN President, International Union for Conservation of Nature, Ashok, A new President for the United States: We have a dream, International Union for Conservation of Nature, 1-27, http://www.iucn.org/involved/opinion/?2595/new-President-for-the-United-States-We-have-a-dream

A rejuvenated America, with a renewed purpose, commitment and energy to make its contribution once again towards a better world could well be the turning point that can reverse the current decline in the state of the global economy, the health of its life support systems and the morale of people everywhere. This extraordinary change in regime brings with it the promise of a deep change in attitudes and aspirations of Americans, a change that will lead, hopefully, to new directions in their nation’s policies and action. In particular, we can hope that from being a very reluctant partner in global discussions, especially on issues relating to environment and sustainable development, the United States will become an active leader in international efforts to address the Millennial threats now confronting civilization and even the survival of the human species.

For the conservation of biodiversity, so essential to maintaining life on Earth, this promise of change has come not a moment too soon.

It would be a mistake to put all of our hopes on the shoulder of one young man, however capable he might be. The environmental challenges the world is facing cannot be addressed by one country, let alone by one man. At the same time, an inspired US President guided by competent people, who does not shy away from exercising the true responsibilities and leadership his country is capable of, could do a lot to spur the international community into action. To paraphrase one of his illustrious predecessors, “the world asks for action and action now.” What was true in President Roosevelt’s America 77 years ago is even more appropriate today.

From IUCN’s perspective, the first signals are encouraging. The US has seriously begun to discuss constructive engagement in climate change debates. With Copenhagen a mere 11 months away, this commitment is long overdue and certainly very welcome. Many governments still worry that if they set tough standards to control carbon emissions, their industry and agriculture will become uncompetitive, a fear that leads to a foot-dragging “you go first” attitude that is blocking progress. A positive intervention by the United States could provide the vital catalyst that moves the basis of the present negotiations beyond the narrowly defined national interests that lie at the heart of the current impasse.

The logjam in international negotiations on climate change should not be difficult to break if the US were to lead the industrialized countries to agree that much of their wealth has been acquired at the expense of the environment (in this case greenhouse gases emitted over the past two hundred years) and that with the some of the benefits that this wealth has brought, comes the obligation to deal with the problems that have resulted as side-effects. With equitable entitlement to the common resources of the planet, an agreement that is fair and acceptable to all nations should be easy enough to achieve. Caps on emissions and sharing of energy efficient technologies are simply in the interest of everyone, rich or poor. And both rich and poor must now be ready to adopt less destructive technologies – based on renewables, efficiency and sustainability – both as a goal with intrinsic merit and also as an example to others.

But climate is not the only critical global environmental issue that this new administration will have to deal with. Conservation of biodiversity, a crucial prerequisite for the wellbeing of all humanity, no less America, needs as much attention, and just as urgently. The United States’ self-interest in conserving living natural resources strongly converges with the global common good in every sphere: in the oceans, by arresting the precipitate decline of fish stocks and the alarming rise of acidification; on land, by regenerating the health of our soils, forests and rivers; and in the atmosphere by reducing the massive emission of pollutants from our wasteful industries, construction, agriculture and transport systems.