# 1ac

### 1ac – plan

#### Plan: The United States federal government ought to eliminate post-tax subsidies for fossil fuels by establishing and implementing a fee on domestic private sector carbon dioxide emissions that begins at 43 dollars per ton and increases annually at a rate of 2 percent or more in accordance with a structured discretionary approach.

### 1ac – climate

#### Climate change causes extinction – ecosystem collapse, resource scarcity, food shortages, and inter-state conflict

Spratt and Dunlop 19

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Impacts: A number of ecosystems collapse, including coral reef systems, the Amazon rainforest and in the Arctic. Some poorer nations and regions, which lack capacity to provide artificially-cooled environments for their populations, become unviable. Deadly heat conditions persist for more than 100 days per year in West Africa, tropical South America, the Middle East and South-East Asia, contributing to more than a billion people being displaced from the tropical zone. Water availability decreases sharply in the most affected regions at lower latitudes (dry tropics and subtropics), affecting about two billion people worldwide. Agriculture becomes nonviable in the dry subtropics. Most regions in the world see a significant drop in food production and increasing numbers of extreme weather events, including heat waves, floods and storms. Food production is inadequate to feed the global population and food prices skyrocket, as a consequence of a one-fifth decline in crop yields, a decline in the nutrition content of food crops, a catastrophic decline in insect populations, desertification, monsoon failure and chronic water shortages, and conditions too hot for human habitation in significant food-growing regions. The lower reaches of the agriculturally-important river deltas such as the Mekong, Ganges and Nile are inundated, and significant sectors of some of the world’s most populous cities — including Chennai, Mumbai, Jakarta, Guangzhou, Tianjin, Hong Kong, Ho Chi Minh City, Shanghai, Lagos, Bangkok and Manila — are abandoned. Some small islands become uninhabitable. Ten percent of Bangladesh is inundated, displacing 15 million people. Even for 2°C of warming, more than a billion people may need to be relocated and In high-end scenarios, the scale of destruction is beyond our capacity to model, with a high likelihood of human civilisation coming to an end. National security consequences: For pragmatic reasons associated with providing only a sketch of this scenario, we take the conclusion of the Age of Consequences ‘Severe’ 3°C scenario developed by a group of senior US national-security figures in 2007 as appropriate for our scenario too: Massive nonlinear events in the global environment give rise to massive nonlinear societal events. In this scenario, nations around the world will be overwhelmed by the scale of change and pernicious challenges, such as pandemic disease. The internal cohesion of nations will be under great stress, including in the United States, both as a result of a dramatic rise in migration and changes in agricultural patterns and water availability. The flooding of coastal communities around the world, especially in the Netherlands, the United States, South Asia, and China, has the potential to challenge regional and even national identities. Armed conflict between nations over resources, such as the Nile and its tributaries, is likely and nuclear war is possible. The social consequences range from increased religious fervor to outright chaos. In this scenario, climate change provokes a permanent shift in the relationship of humankind to nature’. (emphasis added).

#### Defense doesn’t assume co-extinction – comparatively outweighs nuclear war

SD 18

Science Daily, Citing Giovanni Strona, Researcher at European Commission, Joint Research Centre, Climate change risks 'extinction domino effect', 11-29-2018, https://www.sciencedaily.com/releases/2018/11/181129122506.htm, msm

"Even the most resilient species will inevitably fall victim to the synergies among extinction drivers as extreme stresses drive ecosystems to collapse." says lead author Dr Giovanni Strona of the European Commission's Joint Research Centre based in Ispra in northern Italy. Researchers from Italy and Australia simulated 2,000 'virtual earths' linking animal and plant species. Using sophisticated modelling, they subjected the virtual earths to catastrophic environmental changes that ultimately annihilated all life. Examples of the kinds of catastrophes they simulated included runaway global warming, scenarios of 'nuclear winter' following the detonation of multiple atomic bombs, and a large asteroid impact. "What we were trying to test is whether the variable tolerances to extreme global heating or cooling by different species are enough to explain overall extinction rates," "But because all species are connected in the web of life, our paper demonstrates that even the most tolerant species ultimately succumb to extinction when the less-tolerant species on which they depend disappear." "Failing to take into account these co-extinctions therefore underestimates the rate and magnitude of the loss of entire species from events like climate change by up to 10 times," says co-author Professor Bradshaw of Flinders University in South Australia Professor Bradshaw and Dr Strona say that their virtual scenarios warn humanity not to underestimate the impact of co-extinctions. "Not taking into account this domino effect gives an unrealistic and exceedingly optimistic perspective about the impact of future climate change," warns Professor Bradshaw. It can be hard to imagine how the demise of a small animal or plant matters so much, but the authors argue that tracking species up to total annihilation demonstrates how the loss of one can amplify the effects of environmental change on the remainder. "Another really important discovery was that in the case of global warming in particular, the combination of intolerance to heat combined with co-extinctions mean that 5-6 degrees of average warming globally is enough to wipe out most life on the planet," says Dr Strona. Professor Bradshaw further warns that their work shows how climate warming creates extinction cascades in the worst possible way, when compared to random extinctions or even from the stresses arising from nuclear winter.

#### The plan solves – renewables, clean tech and global spillover

Koranyi 16

David, Director, Eurasian Energy Futures Initiative, Atlantic Council, “A US Strategy for Sustainable Energy Security,” ATLANTIC COUNCIL STRATEGY PAPER n. 2, 3—16, p. iii-v.

The national energy system of the United States is aging and has to be renewed in a dynamic fashion to adapt to the transformative changes in the world of energy. Failure to do so will result in substantial economic disadvantage and national security vulnerabilities, and risk the United States’ position as the leading global power in the twenty-first century. The need for modernization represents a unique opportunity to upgrade the United States to a cutting edge system of energy hardware and software. Moreover, climate change is a severe threat to the United States and an existential one to much of the rest of humanity. Climate change represents an ever growing, direct risk to the American people as extreme weather events wreak havoc, rising sea levels engulf coastal cities, and natural beauties and wildlife habitats degrade. The impact of climate change on other countries’ economic, political, and security postures will have major repercussions on US national security and economic prosperity. The United States cannot isolate itself from political and social instability, mass migration, conflict over resources, poverty, and health epidemics that excessive climate change would induce and future generations will have to endure. Taking resolute action to reduce greenhouse gas emissions is a form of ‘insurance’ against the most severe and irreversible potential consequences of climate change. The longer action is postponed, the greater the risks and the higher the costs would be. In today’s interconnected world, responding to the growing energy needs of the developing world amidst a changing climate is critical to the United States’ national security and economic prosperity. Mankind has within its grasp the wherewithal to engineer a global energy revolution. The international community took an important step towards action in Paris in December 2015. Yet the task at hand—the transformation of the entire energy value chain across the globe—is colossal, and will require political will, technological ingenuity, business acumen, and international cooperation on a whole new level. Critical to preventing the most catastrophic consequences of climate change, as well as securing the United States’ economic and environmental security and prosperity in the future is the transformation of the US energy sector, the single largest emitter of greenhouse gases today. Though the task at hand represents a formidable challenge, the United States can revolutionize its energy sector without compromising its energy security and economic development, without a major change in consumption patterns and lifestyles. The benefits of such a transition from a strategic, national security and economic perspective vastly outweigh the short-term costs. A United States that uses cutting edge energy technologies to fuel its economy in cleaner and safer ways is a benefit to current and future generations. American geopolitical, economic, and technological leadership also predisposes the United States to lead and benefit from the energy sector transformation abroad. The global transition to a lower carbon economy plays directly to the comparative advantages of the United States: individual empowerment, innovation, and engineering ingenuity. A world that manages to limit global warming below 1.5 degrees Celsius will be incomparably more peaceful and stable, where it will be easier to promote stability, the prevalence of universal liberal values, and achieve American strategic objectives. Conversely, failure to lead on the global energy transformation and falling behind on climate action will undermine the moral leadership of the United States in the world. The strategy outlined in this paper offers the United States a pathway to become a global leader in both. It does so by building on the experience and mistakes of pioneers in energy transitions, as well as its own early successes, and putting a strong emphasis on transparent market friendly measures. The strategy focuses on accelerating the modernization of its energy sector to fuel a robust economic growth, increase the efficiency of the economy and existing energy value chains while reducing emissions, and prevent the catastrophic consequences of climate change, building upon the progress made in the last decade. It would also maintain and enhance the United States’ edge in the energy domain; boost the competitiveness of the economy; facilitate the provision of sustainable energy globally; ensure the energy security of key allies in Europe and Asia; prevent rivals and adversaries from using energy resources as a weapon; and reduce the volatility of global energy markets to strengthen global growth. The three-pillar strategy’s first pillar builds upon the United States’ unparalleled richness in both human and natural potential. It leverages the United States’ abundance of resources to address climate change in a resolute manner without delay by putting the right domestic policies in place. At the center of this pillar is the accelerated decarbonization of the US economy, based primarily on a well-calibrated and progressively increasing carbon fee. A carbon fee—covering all sectors, not just power generation as the controversial Clean Power Plan—would have several major advantages. It would further boost the competitiveness of cleaner-burning natural gas vis-à-vis coal in the short term. It could propel the upgrade and modernization of fossil fuel generation capacities to cut emissions during the transition, boost the competitiveness of carbon capture and storage techniques to provide a long term future for gas, and propel energy efficiency investments across the whole value chain. It would go a long way in helping to revive the commerciality of nuclear power to provide essential zerocarbon baseload generation capacity to address seasonal intermittency issues that are likely to prevail in the long term. It could boost the United States’ innovative capabilities to maintain a competitive edge in the energy sphere by increasing research and development and early deployment funding.

#### The plan is the best way to decarbonize our energy systems – predictable price signals shift investment towards the best tech

Kaufman et al 16

Noah, economist for the US Climate Initiative in the Global Climate Program, Michael Obeiter, Senior Associate in World Research Institute’s Global Climate Initiative, Eleanor Krause, Researcher and Analyst for World Research Institute’s Carbon Pricing program, “Putting a Price on Carbon: Reducing Emissions” January 2016, <https://www.wri.org/sites/default/files/Putting_a_Price_on_Carbon_Emissions.pdf>

For the United States to meet its goal of over 80 percent emissions reductions by 2050, a transformation of the electricity sector is essential. This will occur only through the development and scaling of new technologies. Most studies of carbon pricing focus on the effects described above because they are relatively predictable. We can measure how consumer demand changes with electricity prices and how low-carbon supply options become more competitive when a carbon price is implemented. But CO2 stays in the atmosphere for hundreds of years and, while the climate is changing today, the worst damages from climate change are decades or centuries away. For that reason, the most important effects of carbon pricing occur over a long-term time scale. A major benefit of carbon pricing policies is that they encourage technological change, so the menu of cost-effective low-carbon alternatives available to producers and consumers will expand over time. The process that drives technological change is complex and not entirely understood. It includes the invention of new technologies, improvements to existing technologies, and the adoption and diffusion of technologies throughout the economy (Jaffe et al. 2003). We refer to inducing technological change as a “very long-run” effect because it can take decades for new technologies to mature, but the advancements can occur quickly as well (particularly improvements and cost reductions for existing technologies). Private businesses fund over 60 percent and perform over 70 percent of total R&D in the United States, with industry responsible for even larger portions of applied research and product development (Newell 2015). A carbon price increases incentives for private businesses to invest in low-carbon technologies because it affects the expected return on investments. A strong and predictable carbon price will ensure that the price of producing electricity with fossil fuels incorporates the costs to society of burning these fuels, thus making new low-carbon technologies more competitive if and when they become available. Larger anticipated market shares for low-carbon innovations imply greater expected returns on investments today. Investments flow toward opportunities with higher expected returns, so a carbon price encourages investments in low-carbon technologies, and these investments are what drive innovation. Increased experience with low carbon technologies will also lead to productivity gains over time. This effect—often referred to as “learning by-doing”—is responsible for major decreases in the costs of solar photovoltaic energy in recent years (Bollinger and Gillingham 2014). Economists attribute a significant portion of the technological progress across the economy to learning-by doing (Arrow 1962). Figure 5 summarizes the pathways by which a carbon price will lead to emissions reductions via technological change. Economic theory and empirical evidence suggest that a strong and predictable carbon price is likely to increase the pace of technological development in the electricity sector by the pathways described in Figure 5. A recent study showed that industry leaders agree with this prediction (New Climate Economy 2014). Importantly, a carbon price encourages innovation without requiring accurate predictions regarding which technologies will be most cost-effective at reducing emissions. This is a major advantage because breakthroughs could emerge from any number of sources—for example, solar, wind, energy storage, nuclear, carbon capture, hydrogen fuel cells, advanced smart grids, or technologies as yet unknown.8 A carbon price encourages all clean-energy technologies simultaneously, thus eliminating the possibility of regulations diverting scarce resources to promote the “wrong” technologies.

### 1ac – tax reform

#### The plan’s revenue would cause corporate tax reductions – assuages republicans and lobbyists

Carbone 16

Jared, Associate Professor at the Colorado School of Mines, PhD in Economics from the University of Colorado at Boulder, September 4th, Email from Teja Leburu to Jared Carbone, https://sites.google.com/site/umndebatepublic/author-correspondence--emissions

\*Language Modified

Teja Leburu: I have been recently delving into Carbon Tax literature, and have come upon an article that you wrote a while back. If a Carbon Tax were implemented today, what do you think the revenue would be used for? Any response would be appreciated. I am asking for an Intercollegiate Debate Project, if it wouldn't impose a burden, could I cite your response? Jared Carbon: Thanks for your message and sorry for the slow response. I assume you're focused on the carbon tax in the U.S. If I had to guess, I would say that the carbon tax revenue would most likely be used to reduce corporate income tax rates or subsidies to industries that would experience cost increases under a carbon tax. Both of my answers are based on political considerations. I think the tax-rate reduction is likely because it's an important policy goal of many republican congress~~men~~[people]. As a result, it might serve as an olive branch that environmental advocates can offer to republicans who would otherwise oppose action on climate change. It also has support from economists who work on tax issues. Subsidies to disadvantaged industries would help reduce opposition from lobbyists supporting carbon-intensive industries. Hope that helps! You may cite me.

#### Biopharma is lagging now – corporate tax reform is key to sustaining the industry and spur innovation

Lechleiter 14

John, PhD, Chair and CEO, Eli Lilly and former National Science Foundation Fellow, Harvard University, “To Guarantee the U.S.’s Economic Future, We Need Tax Reform Now,” FORBES, 1—15—14, http://www.forbes.com/sites/johnlechleiter/2014/01/15/to-guarantee-the-u-s-s-economic-future-we-need-tax-reform-now/#6624ddfd4caa, accessed 9-9-16.

America is the world leader in innovative industries such as biopharmaceuticals, but we’re kidding ourselves if we think that continued U.S. leadership is guaranteed. Among the many challenges we have to confront is a corporate tax system that’s way out of step with competitors around the world. High corporate tax rates disadvantage U.S. companies in the global marketplace and deny them investment opportunities here at home that could boost the economy and create jobs. We are long overdue for reform. So it’s good news that both House Ways & Means Chairman Dave Camp and Senate Finance Chairman Max Baucus have released discussion drafts that provide a useful platform for public dialogue. Now, some elements of these discussion drafts are problematic, but they will be refined in the months ahead. Corporate tax reform is bound to be a long and difficult process, so rather than stress points of disagreement, I’d like to seek common ground by outlining some general principles for reform – and the clear solutions that flow from them. Lower tax rates. Fact: America has one of the highest statutory corporate tax rates in the world – 39.1 percent. That’s 14 percentage points above the average for OECD countries, according to the Tax Foundation. And in case you’ve heard that the U.S. tax rate is offset by generous deductions, let me add that we have the highest effective tax rate, with an average burden of 30.9 percent in 2012. That’s the finding of a recent study by PricewaterhouseCoopers . It’s not hard to see how the world’s highest tax rate discourages investment in the United States, when a company can expect to pay nearly twice as much in taxes here on average as it would in the United Kingdom (16.7 percent effective tax rate) or Hong Kong (16.5). If we want the U.S. to be competitive in the global marketplace, we need a statutory corporate tax rate of no more than 25 percent. Global companies make complex investment decisions in markets around the world, often with years of advance planning. We look at factors like ease of market access, the availability of a qualified workforce and existing resources, and the cost of operations – all of which can be impacted by tax rates. When we’re talking about investments in the billions of dollars – for example, it costs north of $1 billion to take a new medicine from concept to pharmacy or to build a modern pharmaceutical production facility – even fractions of tax percentage points can make or break investment decisions. Lowering rates should be a guiding principle for corporate tax reform.

#### US biopharma is key to solve emerging biogenic threats

PCAST 12

President’s Council of Advisors on Science and Technology (An advisory group of the nation’s leading scientists and engineers, appointed by the President to augment the science and technology advice available to him from inside the White House and from cabinet departments and other Federal agencies), “Report To The President On Propelling Innovation In Drug Discovery, Development, and Evaluation,” (September 2012)

Innovative Medicines Have Made Tremendous Contributions to Public Health Biomedical innovations—including advances in medicines, medical procedures, and public health—have provided extraordinary benefits to the U.S. public. We live longer and we live healthier than our forebears. Life expectancy at birth has risen from around 47 years at the turn of the 20th century to 78 years today. 4 Many diseases that were once fatal or debilitating can now be prevented, delayed, or ameliorated. While nutrition, sanitation, other public health measures, and expanded access to care have been major sources of increasing human health, innovative medicines have also played a profound role in this progress. Infections that were the leading cause of mortality in the early 20th century are now largely eliminated. Pneumonia, the leading cause of death in the early 20th century, is now effectively treated with antibiotics. Vaccines have led to the eradication or control of many devastating infectious diseases, including polio, small pox, diphtheria, and measles. First recognized in 1981, HIV is now treated with over 20 FDA-approved drugs, although more progress is still needed. Multi-drug regimens effectively control HIV infection, preventing the development of AIDS. Pharmaceutical therapies have led to cures for multiple malignancies that were once universally fatal; for example, childhood leukemia is now cured in 80 percent of cases, testicular cancer in over 90 percent of cases, and Hodgkin’s lymphoma in over 90 percent of cases. Recombinant proteins, replacing specific proteins that are not effectively produced by individuals carrying certain genetic mutations, have transformed the therapies for multiple debilitating disorders including type I diabetes and hemophilia. Immunosuppressive drugs have offered effective therapies for autoimmune disorders, such as multiple sclerosis, and have enabled organ transplantation. Along with a reduction in smoking and better medical care, cholesterol-lowering therapy, blood pressure- lowering drugs, anti-platelet agents, and diabetes treatment have contributed to a substantial decrease in death from heart attacks (70 percent decline5 over the past 60 years). Innovation in Medicine has Depended on a Partnership Among Researchers, Industry, and Regulators These innovations have been brought forth by a remarkable ecosystem consisting of three major components: (1) academic researchers who have unlocked secrets of basic biology and revealed mechanisms that underlie disease, as well as the Federal and other funders who support their research; (2) a robust bio-pharmaceutical industry, which has developed molecules to treat disease and conducted clinical trials to demonstrate their safety and efficacy; and (3) government regulators, who have balanced the benefits and risks that are inherent in any medical innovation. Patients themselves have played a critical role in propelling advances by focusing attention on the urgency of developing therapies and spurring creative approaches, and by participating in clinical trials. Medical progress depends on a successful partnership among these sectors. Others, including physicians, health care payors, pharmacists, and consumer groups, also play crucial roles. The United States has consistently led the world in all these areas: (i) Academic research. By any measure, the Nation has been the world leader in groundbreaking biomedical research. This success is owed in large part to the strength of its extraordinary universities and research institutions. Federal investments in the biomedical research enterprise, led by the National Institutes of Health (NIH) and augmented by other agencies, have for the last 60 years propelled research advances by supporting a robust academic community that generates biomedical knowledge, patentable inventions, and trained scientists, including 135 NIH-funded Nobel Laureates.6 In 2010, Federal funding for health research totaled about $46 billion (about $35 billion from NIH, of which $5 billion was provided under the Recovery Act 7), while private and public health research funding combined reached $140 billion.8 (ii) Biopharmaceutical industry. The United States has also been an indisputable leader in the global biopharmaceutical industry. This leadership has resulted from a combination of factors, including: a strong patent system, access to capital, strong support for research and development (R&D) by both public and private funders, a high-quality science-based regulatory system at the Food and Drug Administration (FDA), and a market that recognizes and pays for innovative new medicines. As of 2005, 8 of the world’s top 15 pharmaceutical companies (by sales) were headquartered in the United States.9 Since the 1960s, the United States has been the headquarters for a larger share of firms that invent and introduce to market new chemical entities (NCEs) than any other country, and from 2001-2010, U.S.-based firms invented 57 percent of the NCEs produced globally.10 More than half of all clinical trials underway are being conducted in whole or in part in the United States.11 In the last three decades of the 20th century, a revolution in molecular biology and associated technologies, including recombinant DNA, gave birth to a new industry, biotech. The biotech industry arose and has flourished in the United States, with strong early clusters in the high-tech and highly-educated areas near San Francisco and Boston, and subsequent expansion to other locations including Seattle, San Diego, North Carolina, Maryland, and Virginia. A unique combination of access to academic research institutions, scientists, and venture capitalists created the ripe conditions for the industry to take hold and grow from the 1980s to today, aided by supportive legislation, such as the Bayh-Dole Act, that encouraged universities and businesses to commercialize scientific discoveries in biotechnology. The United States accounts for more than 40 percent of the world’s patents in biotechnology—far more than the E.U. at 25 percent and Japan at 17 percent. 12 The Nation’s leadership in biomedical innovation has been supported by a robust industry, and, in turn, investments in biomedical research and corresponding medical advances have allowed industry and the economy to thrive. Biomedical innovation has supported U.S. economic growth, and high-value, high-skilled jobs for Americans. The medical innovation sector as a whole (including the public and private enterprises) employs nearly one million people 13 and industry-contracted studies show that exports in 2010 from the biopharmaceutical industry reached nearly $47 billion, with a subset of the industry, biotechnology products yielding a net positive trade balance. 14 This is a source of significant export strength relative to major industries, such as automobiles ($38.4 billion in 2010 exports); plastics and rubber products ($25.9 billion in 2010 exports); communications equipment ($27 billion); and computers ($12.5 billion). Pharmaceutical sales have increased steadily over the past decade, 15 reaching a record high of $856 billion in 2010. The biopharmaceutical industry estimates that it pays an average salary of $96,563 to the 650,000 people it employs, and that it has indirectly contributed more than $300 billion to U.S. GDP.16 Moreover, public health gains as a result of biomedical innovation bolster the U.S. economy; the growth in life expectancy between 1970 and 1990, for example, had added approximately $2.4 trillion to the U.S. GDP by the year 2000. 17 pg. 1-3

#### Biopharma is key to solve inevitable rapidly mutating pandemics

Sachs 14

Jeffery—Professor of Sustainable Development, Health Policy and Management @ Columbia University [Jeffrey D. Sachs (Director of the Earth Institute @ Columbia University and Special adviser to the United Nations Secretary-General on the Millennium Development Goals) “Important lessons from Ebola outbreak,” Business World Online, August 17, 2014, http://tinyurl.com/kjgvyro]

Ebola is the latest of many recent epidemics, also including AIDS, SARS, H1N1 flu, H7N9 flu, and others. AIDS is the deadliest of these killers, claiming nearly 36 million lives since 1981. Of course, even larger and more sudden epidemics are possible, such as the 1918 influenza during World War I, which claimed 50-100 million lives (far more than the war itself). And, though the 2003 SARS outbreak was contained, causing fewer than 1,000 deaths, the disease was on the verge of deeply disrupting several East Asian economies including China’s. There are four crucial facts to understand about Ebola and the other epidemics. First, most emerging infectious diseases are zoonoses, meaning that they start in animal populations, sometimes with a genetic mutation that enables the jump to humans. Ebola may have been transmitted from bats; HIV/AIDS emerged from chimpanzees; SARS most likely came from civets traded in animal markets in southern China; and influenza strains such as H1N1 and H7N9 arose from genetic re-combinations of viruses among wild and farm animals. New zoonotic diseases are inevitable as humanity pushes into new ecosystems (such as formerly remote forest regions); the food industry creates more conditions for genetic recombination; and climate change scrambles natural habitats and species interactions. Second, once a new infectious disease appears, its spread through airlines, ships, megacities, and trade in animal products is likely to be extremely rapid. These epidemic diseases are new markers of globalization, revealing through their chain of death how vulnerable the world has become from the pervasive movement of people and goods. Third, the poor are the first to suffer and the worst affected. The rural poor live closest to the infected animals that first transmit the disease. They often hunt and eat bushmeat, leaving them vulnerable to infection. Poor, often illiterate, individuals are generally unaware of how infectious diseases -- especially unfamiliar diseases -- are transmitted, making them much more likely to become infected and to infect others. Moreover, given poor nutrition and lack of access to basic health services, their weakened immune systems are easily overcome by infections that better nourished and treated individuals can survive. And “de-medicalized” conditions -- with few if any professional health workers to ensure an appropriate public-health response to an epidemic (such as isolation of infected individuals, tracing of contacts, surveillance, and so forth) -- make initial outbreaks more severe. Finally, the required medical responses, including diagnostic tools and effective medications and vaccines, inevitably lag behind the emerging diseases. In any event, such tools must be continually replenished. This requires cutting-edge biotechnology, immunology, and ultimately bioengineering to create large-scale industrial responses (such as millions of doses of vaccines or medicines in the case of large epidemics). The AIDS crisis, for example, called forth tens of billions of dollars for research and development -- and similarly substantial commitments by the pharmaceutical industry -- to produce lifesaving antiretroviral drugs at global scale. Yet each breakthrough inevitably leads to the pathogen’s mutation, rendering previous treatments less effective. There is no ultimate victory, only a constant arms race between humanity and disease-causing agents.

#### Continual research solves and deters bio-attacks

Chyba 4

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[Christopher & Alex Greninger, “Biotechnology and Bioterrorism: An Unprecedented World” Survival, 46:2, Summer 2004, http://iis-db.stanford.edu/pubs/20722/Chyba\_2004.pdf]

In the absence of a comprehensive and effective system of global review of potential high-consequence research, we are instead trapped in a kind of offence–defence arms race. Even as legitimate biomedical researchers develop defences against biological pathogens, bad actors could in turn engineer countermeasures in a kind of directed version of the way natural pathogens evolve resistance to anti-microbial drugs. The mousepox case provides a harbinger of what is to come: just as the United States was stockpiling 300m doses of smallpox vaccine as a defence against a terrorist smallpox attack, experimental modification of the mousepox virus showed how the vaccine could possibly be circumvented. The United States is now funding research on antiviral drugs and other ways of combating smallpox that might be effective against the engineered organism. Yet there are indications that smallpox can be made resistant to one of the few known antiviral drugs. The future has the appearance of an eternal arms race of measures and countermeasures. The ‘arms race’ metaphor should be used with caution; it too is in danger of calling up misleading analogies to the nuclear arms race of the Cold War. First, the biological arms race is an offence–defence race, rather than a competition between offensive means. Under the BWC, only defensive research is legitimate. But more fundamentally, the driver of de facto offensive capabilities in this arms race is not primarily a particular adversary, but rather the ongoing global advance of microbiological and biomedical research. Defensive measures are in a race with nefarious applicationsof basic research, much of which is itself undertaken for protection against natural disease. In a sense, we are in an arms race with ourselves. It is hard to see how this arms race is stable – an offence granted comparable resources would seem to be necessarily favoured. As with ballistic missile defence, particular defensive measures may be defeated by offensive countermeasures. In the biological case, implementing defensive measures will require not only research but drug development and distribution plans. Offensive measures need not exercise this care, although fortunately they will likely face comparative resource constraints (especially if not associated with a state programme), and may find that some approaches (for example, to confer antibiotic resistance) have the simultaneous effect of inadvertently reducing a pathogen’s virulence. The defence must always guard against committing the fallacy of the last move, whereas the offence may embrace the view of the Irish Republican Army after it failed to assassinate the British cabinet in the 1984 Brighton bombing: ‘Today we were unlucky, but remember we have only to be lucky once – you will have to be lucky always’.40 At the very least, the defence will have to be vigilant and collectively smarter than the offence. The only way for the defence to win convincingly in the biological arms race would seem to be to succeed in discovering and implementing certain de facto last-move defences, at least on an organism-by-organism basis. Perhaps there are defences, or a web of defences, that will prove too difficult for any plausible non-state actor to engineer around. Whether such defences exist is unclear at this time, but their exploration should be a long-term research goal of US biodefence efforts. Progress might also have an important impact on international public health. One of the ‘Grand Challenges’ identified by the Bill and Melinda Gates Foundation in its $200m initiative to improve global health calls for the discovery of drugs that minimise the emergence of drug resistance – a kind of ‘last move’ defence against the evolutionary countermeasures of natural microbes.41 Should a collection of such defensive moves prove possible, bioterrorism might ultimately succumb to a kind of globalised dissuasion by denial:42 non-state groups would calculate that they could not hope to achieve dramatic results through biological programmes and would choose to direct their efforts elsewhere.

#### Bioweapons cause extinction

Sandberg 8

Anders et al., James Martin Research Fellow, Future of Humanity Institute, Oxford University, "How Can We Reduce the Risk of Human Extinction?" BULLETIN OF THE ATOMIC SCIENTISTS, 9--9—08, http://www.thebulletin.org/web-edition/features/how-can-we-reduce-the-risk-of-human-extinction.

The risks from anthropogenic hazards appear at present larger than those from natural ones. Although great progress has been made in reducing the number of nuclear weapons in the world, humanity is still threatened by the possibility of a global thermonuclear war and a resulting nuclear winter. We may face even greater risks from emerging technologies. Advances in synthetic biology might make it possible to engineer pathogens **capable of extinction-**level pandemics. The knowledge, equipment, and materials needed to engineer pathogens are more accessible than those needed to build nuclear weapons. And unlike other weapons, pathogens are **self-replicating**, allowing a small arsenal to become **exponentially destructive**. Pathogens have been implicated in the extinctions of many wild species. Although most pandemics "fade out" by reducing the density of susceptible populations, pathogens with wide host ranges in multiple species can reach even isolated individuals. The intentional or unintentional release of engineered pathogens with high transmissibility, latency, and lethality might be capable of causing human extinction. While such an event seems unlikely today, the likelihood may increase as biotechnologies continue to improve at a rate rivaling Moore's Law.

#### Synthetic biology makes bioterror inevitable – creates means and motive

Rose 14

PhD, recognized international biodefense expert

[Patrick, Center for Health & Homeland Security senior policy analyst & biosecurity expert, National Defense University lecturer, and Adam Bernier, expert in counter-terrorism, "DIY Bioterrorism Part II: The proliferation of bioterrorism through synthetic biology," CBRNePortal, 2-24-14, www.cbrneportal.com/diy-bioterrorism-part-ii-the-proliferation-of-bioterrorism-through-synthetic-biology/, accessed 8-16-14]

In Part I of this series, we examined how the advancement of synthetic biology has made bio-engineering accessible to the mainstream biological community. Non-state actors who wish to employ biological agents for ill intent are sure to be aware of how tangible bio-weapons are becoming as applications of synthetic biology become more affordable and the probability of success increases with each scientific breakthrough. The willingness of non-state actors to engage in biological attacks is not a new concept; however, the past biological threat environment has been subdued compared to that of conventional or even chemical terrorism. The frequency and deadliness of biological attacks has, thankfully, been limited; much of which can be attributed to the technical complexity or apparent ineptitude of the perpetrators developing biological weapons. Despite the infrequency and ineffectiveness of biological attacks in the last four decades, the threat may be changing with the continued advancement of synthetic biology applications. Coupled with the **ease of info**rmation **sharing** and a **rapidly growing do-it**-**yourself-biology** (DIYbio) **movement** (discussed in Part I), the chances of not only, more attacks, but potentially more deadly ones will inevitably increase.¶ During the last half century terrorist organizations have consistently had an interest in using biological weapons as a means of attacking their targets, but only few have actually made a weapon and used it. The attraction is that terrorist activities with biological weapons are difficult to detect and even more difficult to attribute without a specific perpetrator claiming responsibility. Since 1971 there have been more than 113,113 terrorist attacks globally and 33 of them have been biological. The majority of bio-terrorism incidents recorded occurred during the year 2001 (17 of the 33); before 2001 there were 10 incidents and since 2001 there were 6 (not counting the most recent Ricin attacks). The lack of a discernable trend in use of bio-terrorism does not negate the clear intent of extremist organizations to use biological weapons. In fact, the capacity to harness biological weapons more effectively today only increases the risk that they will successfully be employed.¶ The landscape is changing: previously the instances where biological attacks had the potential to do the most harm (e.g., Rajneeshees cult’s Salmonella attacks in 1984, Aum Shinri Kyo’s Botulinum toxin, and Anthrax attacks in the early 90’s) included non-state actors with access to large amounts of funding and scientists. Funding and a cadre of willing scientists does not guarantee success though. The assertion was thus made that biological weapons are not only expensive, they require advanced technical training to make and are even more difficult to effectively perpetrate acts of terrorism with. While it is difficult to determine with certainty whether the expense and expertise needed to create biological weapons has acted as a major deterrent for groups thinking of obtaining them, many experts would argue that the cost/expertise barrier makes the threat from biological attacks extremely small. This assertion is supported by the evidence that the vast majority of attacks have taken place in Western countries and was performed by Western citizens with advanced training in scientific research.¶ In the past decade the cost/expertise assertion has become less accurate. Despite the lack of biological attacks, there are a number of very dangerous and motivated organizations that have or are actively pursuing biological weapons. The largest and most outspoken organization has been the global Al Qaeda network, whose leaders have frequently and passionately called for the development (or purchase) of Weapons of Mass Destruction (WMD). The principal message from Al Qaeda Central and Al Qaeda in the Arabian Peninsula (AQAP) has included the call to use biological WMDs to terrorize Western nations. Al Qaeda has had a particular focus on biological and nuclear weapons because of their potential for greatest harm. Osama Bin Laden, Ayman al-Zawahiri and Anwar al-Awlaki have all called for attacks using biological weapons, going so far as to say that Muslims everywhere should seek to kill Westerners wherever possible and that obtaining WMDs is the responsibility of all Muslims. Before the US-led invasion of Afghanistan, Al Qaeda had spent significant funds on building a bio-laboratory and had begun collecting scientists from around the world; however, the Afghanistan invasion and subsequent global War on Terrorism is thought to have disrupted their capabilities and killed or captured many of their assets. Despite the physical setbacks, this disruption does not appear to have changed the aggressive attitude towards obtaining WMDs (e.g., more recently U.S. Intelligence has been concerned about AQAP attempting to make Ricin).¶ The emergence of synthetic biology and DIYbio has increased the likelihood that Al Qaeda will succeed in developing biological WMDs. The low cost and significantly reduced level of necessary expertise may change how many non-state actors view biological weapons as a worthwhile investment. This is not to say that suddenly anyone can make a weapon or that it is easy. To the contrary making an effective biological weapon will still be difficult, only much easier and cheaper than it has been in the past.¶ The rapid advancements of synthetic biology could be a game changer, giving organizations currently pursuing biological weapons more options, and encouraging other organizations to reconsider their worth. Because the bar for attaining biological weapons has been lowered and is likely to continue to be lowered as more advances in biological technology are made, it is important that the international community begin to formulate policy that protects advances in science that acts to prevent the intentional misuse of synthetic biology. Disregard for this consideration will be costly. A successful attack with a potent biological weapon, where no pharmaceutical interventions might exist, will be deadly and the impact of such an attack will reverberate around the globe because biological weapons are not bound by international borders.

#### Diseases causes extinction – no burnout

MacPhee et al. 13

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Infectious disease, especially virulent infectious disease, is commonly regarded as a cause of fluctuation or decline in biological populations. However, it is not generally considered as a primary factor in causing the actual endangerment or extinction of species. We review here the known historical examples in which disease has, or has been assumed to have had, a major deleterious impact on animal species, including extinction, and highlight some recent cases in which disease is the chief suspect in causing the outright endangerment of particular species. We conclude that the role of disease in historical extinctions at the population or species level may have been underestimated. Recent methodological breakthroughs may lead to a better understanding of the past and present roles of infectious disease in influencing population fitness and other parameters. 1. Background Although lethal epi- or panzootics are obvious risk factors that can lead to population fluctuation or decline in particular circumstances, infectious diseases are seldom considered as potential drivers of extirpation or extinction—that is, of the complete loss of all populations or subunits comprising a given biological species. For example, in conservation biology, infectious disease is usually regarded as having only a marginal or contributory influence on extinction, except perhaps in unusual circumstances (e.g., [1–4]). In their examination of 223 instances of critically endangered species listed by the IUCN (International Union for Conservation of Nature) as allegedly threatened by infectious disease, Smith et al. [4] found that in the overwhelming majority of cases there was no conclusive evidence to support infectious disease as a contributing threat. Although this record should improve with increasing awareness of the effects of infectious diseases on wildlife, as this paper illustrates progress has so far been slow. Both of the authors of this paper are primarily concerned with mammals, which is the group that will receive the bulk of attention here. However, at the pragmatic, data-gathering level, the issues concerned with properly accounting for and evaluating the effects of infectious diseases on natural populations differ little from one phylogenetic grouping to another. First, narrowing down extinction events or even catastrophic population declines to single causes is almost always problematic. In most real cases, extinction is multicausational, even if one cause can be identified as being predominantly responsible [5]. Habitat fragmentation and climate change are currently regarded as the leading prime movers behind most instances of extreme endangerment, to which other stressors such as pollution, invasive competitors, and so forth, might be of greater or lesser importance in particular circumstances. Disease, however, is rarely mentioned as a possible contributing factor in such contexts (but see [6]). Another difficulty is lack of knowledge about pathogen diversity and susceptibility in wildlife. In the absence of sufficient means of detection and characterization, it is difficult to assess or to give quantitative expression to the degree to which pathogens might influence population decline or extinction. Thus it has been estimated that only a small fraction of bacterial diversity has been identified at even the most basic systematic level. This problem is exacerbated in the case of viruses, which often evolve rapidly and defy, in any case, classical methodologies for identifying “species” [7]. For example, bat viruses have only recently begun to be described systematically, even though many chiropterans are known vectors of numerous zoonotic diseases and corporately represent the second largest grouping (by species richness) of mammals after rodents [8, 9]. A similar lack of knowledge affects our understanding of parasites and fungi that affect wildlife. The foregoing difficulties are compounded when one considers that, unless a species is studied extensively during and up to the actual extinction event affecting it, all extinction studies are retrospective. Retrospective investigation of losses in which disease is possibly implicated is often severely hindered by limitations in the number and quality of samples available for study, as well as the inability to satisfy Koch’s postulates—especially if both host and pathogen became extinct simultaneously [10]. Performing isolation, reisolation, and reinfection experiments to directly establish that a particular pathogen was indeed the causative agent behind a given infection is either very difficult or impossible to do retrospectively. Isolation and recreation of the 1918 H1N1 influenza A virus [11], for example, were performed by sequencing from extractions derived from individuals thought to have died of the disease in WWI, not by directly isolating the infectious virus from tissues (as would be required to formally comply with Koch’s postulates). Although most studies will have to be correlative rather than dispositive, one can nevertheless test hypotheses concerning plausible causal agents and examine samples for presence/absence of specific pathogens [12]. Forensically, decay, degradation, and chemical changes in DNA post mortem produce severe methodological challenges to retrieving and accurately determining sequences [13]. In addition, in any retrospective investigation involving “ancient DNA,” pathogen nucleic acids will be less abundant than those of the host, and this dilution effect will make sequence retrieval even more complex [10]. For example, relatively abundant mitochondrial DNA is generally easier to retrieve from fossils or historical samples than lower copy per cell nuclear DNA. Pathogen nucleic acids are generally even lower copy than host DNA sequences in a given extraction. These and other factors reviewed here may help to explain the paucity of conclusive studies of disease-mediated extinction, except in the very few instances in which sampling and methodological roadblocks could be overcome. Nonetheless, in favorable circumstances it should be possible to genetically analyze ancient pathogens with sufficient accuracy to make the endeavor worthwhile, especially because next-generation sequencing methods are beginning to make such endeavors ever more feasible [14–18]. Why should the possible role of infectious disease in endangerment and extinction be regarded as a critical issue in modern conservation? Whether or not disease was ever a major cause of extinction in the fossil record [19], in our times it plays an acknowledged but perhaps underestimated role. Pathogen-driven population declines have been identified in a wide array of invertebrate and vertebrate taxa (cf. [20]), suggesting that the phenomenon is probably universal. Yet without the kinds of monitoring methods now available, some and perhaps most of these declines would have gone undetected, or attributed to other causes. Further, the processes forcing such declines are as diverse as the pathogens themselves and are far from being clearly understood. The apparent increase in zoonotic diseases during the last few decades [21] may be objectively real or merely due to better monitoring, but it seems highly likely that loss or reduction of pristine habitats and the overall impact of invasive species should promote the introduction of opportunistic pathogens into wildlife with increasing frequency. Thus, understanding the dynamics of disease-mediated species declines may be critical to conservation missions concerned with a wide variety of species and habitats. Recent advances in molecular biology and microbiology have permitted the detection and identification of hosts of novel microorganisms, many of which are pathogenic, and the technology needed to assess threat levels is becoming increasingly available. 2. Disease as an Agent of Extinction: Some Considerations Although the fossil record clearly establishes that the fate of all species is to eventually die out, it is obvious from the same record that the rate of disappearance of individual species varies significantly [22]. As already noted, inferences about how (as opposed to when) an individual species disappeared must be developed inductively and retrospectively. An important guideline is that apparent causes of extinction that are diachronic (repeatedly affect species across time) are inherently more plausible than ones that are claimed to have occurred only once, or apply to only one taxon. Although this means that explanations about individual extinctions are not strictly testable, they can nevertheless be evaluated in terms of likelihood, which is the approach currently taken by the International Union for Conservation of Nature (IUCN) and several other conservation organizations interested in compiling extinction statistics [23, 24]. It is an accepted tenet in conservation biology that any severe, continuing threat to a species might eventually contribute to its extinction [25]. From this perspective, it is also accepted that diseases presenting with very high levels of mortality—as in the case of a highly transmissible infection that is newly emergent in a population—can cause outright endangerment. But are there conditions under which a disease, probably in combination with other threats, might so imperil a species to cause its complete disappearance? MacPhee and Marx [19] considered this issue from the standpoint of model pathogenic features that a disease-provoking organism might exhibit in forcing the extinction of a given species. These features include: (1) a reservoir species presenting a stable carrier state for the pathogen, (2) a high potential for causing infections in susceptible species, affecting critical age groups, (3) a capacity for hyperlethality, defined here as mortality rates in the range of 50–75%. Only under the most extreme conditions is it conceivable that a species would suffer extinction in a single epizootic event. Much more likely would be repeated outbreaks over a period of years gradually reducing the fitness level of the species, with final disappearance potentially caused by stochastic events (such as causally unassociated climate change). One way in which this condition might be achieved would be through a stable carrier (i.e., a species other than the target, living in similar circumstances in the same environment, and in which the infection is inapparent or at least sublethal). A well-studied example is the transfer of simian acquired immunodeficiency virus from one species of macaque to another [26]. Although this instance occurred under captive conditions, repeated outbreaks of distemper in lions and African wild dogs have long been thought to be due to transfer from domestic dogs (although the mechanism is debated; see [27]). Obviously, for a disease to have a very severe impact, it would be necessary for the pathogen to occur in highly lethal, aggressive strains that strongly impact the target species before attenuated strains arise and become common. High potential for causing infections in a susceptible species is usually associated with the ability to successfully enter the organism through a major portal, such as the respiratory tract, where it can be lodged and transmitted easily (e.g., via aerosol). To achieve hyperlethality and produce serious mortality, all age groups within a species would probably have to be susceptible, not just the very young or very old (or the immunocompromised), with death the usual outcome. In large-bodied mammals, a fundamental consideration is that any process that deleteriously affects young individuals will have a pronounced effect on survivorship because of the lengthy intervals in birth spacing [19]. Lethality in the range of 50–75% is obviously extremely high and thus extremely unusual, although historically seen in Ebola infections in humans and in experimental transmission studies from pigs to macaques [28]. High percentages may have also been achieved in rinderpest outbreaks among East African bovids in the early 20th century [29], although quantitative data on this are largely lacking. An important issue here, however, is whether pathogens causing this level of lethality could maintain themselves in nature long enough to seriously imperil a species. Speculatively, a possible outcome with hyperlethal infections producing a rapid, fatal outcome is that affected populations would be reduced to small numbers of widely dispersed and/or relatively or completely immune individuals. Under these circumstances, the epizootic would necessarily abate as it ran out of new hosts, leading to the conclusion that exceptionally lethal diseases cannot be indefinitely maintained in a population or species under normal circumstances. However, if reservoirs exist from which the pathogen could repeatedly emerge, in principle epizootics might resurge year after year until population sizes were reduced below viable levels (~50–500 individuals). At this point stochastic effects might intervene and lead to complete loss of the species. Among possible examples of this “perfect storm” of circumstances and consequences is the loss of Christmas Island rats, detailed elsewhere in this paper. Among birds, the severe impact of avian malaria on Hawaiian honeycreepers is also pertinent and discussed later in this paper. Although a number of honeycreeper species survive at high elevations, above the limit at which introduced Culex mosquitos can survive, there are multiple adventitious threats, such as deforestation and competition from invasive species, which add to their endangerment picture [30].

### 1ac – leadership

#### The aff is key to global governance---only a national carbon price creates credible commitments to international actions

Spitz 16 – internally citing a climate conference co-organised by the Global Climate Network which consists of nine think tanks around the world, including CAP, that cooperate on addressing issues related to clean energy and global warming – conference included/article cites 10 experts, including: Arabinda Mishra, director of the Climate Change Division at The Energy Resources Institute in India AND Andrew Light - CAP Senior Fellow AND Jiahua Pan, executive director of the Research Centre for Sustainable Development at the Chinese Academy of Social Sciences AND Marie Parramon, a sustainability legal specialist at the South African research consultancy IMBEWU AND Andrew Pendleton, senior research fellow at the Institute for Public Policy Research in the United Kingdom [Johnathan, writer for the Global Climate Network, “The world waits on US climate action: GCN panel of climate experts emphasizes importance of US leadership” GCN | May 1st, 2016| <http://www.globalclimatenetwork.info/news/the-world-waits-on-us-climate-action-gcn-panel-of-climate-experts-emphasizes-importance-of-us-leadership/>]

If we look at the Indian scene and look at the actions being taken by state and central governments, it’s a little bit difficult to understand why it is so difficult to get strong legislation passed domestically in the United States, said Arabinda Mishra, director of the Climate Change Division at The Energy Resources Institute in India, at a CAP panel discussion on Thursday. Mishra was joined by climate experts from around the world, who described continuing and ambitious efforts to reduce carbon emissions in Europe and the developing world and expressed confusion and dismay at the U.S. Senate’s inability to move such legislation forward. The panel agreed that convincing action from Congress is necessary to persuade governments and private actors worldwide that significantly reducing emissions is both necessary and possible. CAP Senior Fellow Andrew Light moderated the panel, which was co-organised by the Global Climate Network. The Global Climate Network consists of nine think tanks around the world, including CAP, that cooperate on addressing issues related to clean energy and global warming. Light cited the U.S. Environmental Protection Agency’s report released earlier this summer on the climate legislation proposed by Sens. John Kerry (D-MA) and Joe Lieberman (I-CT). The agency analysis showed that one scenario would provide a 50 percent chance of stabilizing global temperature increases at 2° C by the end of the century—and that’s only if the countries in the Group of 8 fulfill their commitments to reduce emissions by 80 percent by 2050 and the major carbon polluters in the developing world don’t begin aggressively reducing their emissions until 2050. I don’t like those odds. I don’t like a coin toss on my children’s future, Light said. But, he added, the analysis reveals how much developed countries can accomplish to prevent climate change if the United States steps up. Panelists agreed that countries around the world look to the United States for leadership in reducing emissions. Jiahua Pan, executive director of the Research Centre for Sustainable Development at the Chinese Academy of Social Sciences, explained that many of his compatriots doubt whether they can achieve continued economic growth as well as significant reductions in emissions without U.S. action. “If you would do a little more, that would be an encouragement for the Chinese to do a little more. If you would do much better, that would give the Chinese confidence that they can improve their standard of living without increasing carbon emissions,” he said. China has already taken determined and ambitious steps to create a clean energy infrastructure. The country shut down inefficient coal-fired power plants with a total capacity of 60 gigawatts—the size of the entire U.K. electricity system. But, said Pan, if the United States proves unable to significantly reduce its emissions, it would reinforce the lack of confidence among many Chinese that further reductions are possible alongside continued industrialization and urbanization. American inaction has also created uncertainty about U.S. intentions internationally. Marie Parramon, a sustainability legal specialist at the South African research consultancy IMBEWU, explained that her country’s government was preparing to levy a tax on carbon dioxide emissions and that many in the South African private sector are convinced that reducing emissions is necessary to maintain competitiveness in the long term. But the United States’ failure to create a carbon market or finance the development of clean energy technology is creating anxiety. South Africans in government and in the private sector are growing hesitant to continue with their efforts on climate change, said Parramon. “Just by having you on board in a much more clear position will create momentum on the national level and the international level,” she told the audience at CAP. When asked whether other actions could build confidence, such as EPA regulation of carbon dioxide, action by state governments, or regional efforts such as the Northeast Greenhouse Gas Initiative, Mishra responded that these could send a positive message but would lack the substance of resolute action in Washington. Domestic and local governments in developing countries can only do so much without expertise and financial instruments from the international community, he said. Andrew Pendleton, senior research fellow at the Institute for Public Policy Research in the United Kingdom, said that developing clean energy technology and infrastructure is in the United States’ economic interests—concerns about international confidence and finance aside. “Climate friendly technology is going to be the next wave of economic development—that’s the belief in Europe,” he said. He summarized European actions to reduce greenhouse gas emissions, which he characterized as motivated more by their desire to make their economies more competitive internationally than by concerns about global warming. “If I was sitting where you are sitting and looking at Europe, I would maybe be thinking, ‘if we don’t do this for climate reasons, let’s think of some other reasons to do it,” Pendleton said. But from a sense of maintaining credibility in its international commitments, that America needs to come up with strong legislation,” he said, drawing nods from members of the audience.

#### Clarity of the signal requires pricing—the plan is uniquely symbolic

Richardson & Fraas 13 – assistant professor at the University of South Carolina School of Law & both are Visiting fellows at Resources for the Future [Nathan Richardson, Arthur G. Fraas, May 9, 2013, Comparing the Clean Air Act and a Carbon Price, DISCUSSION PAPER, Resources for the Future]

Climate change is a global problem, and reducing emissions of the GHGs that cause it is a global responsibility. The United States, one of the largest emitters, has been slower than most other developed economies to commit to emissions reductions. Doing so would provide an important signal and could influence other countries to follow suit through bi- or multilateral agreements. But this signal depends on the strength and clarity of US action. If US policy is relatively weak, or is perceived to be so, it will not be influential. Similarly, if US policy is meaningful but difficult to understand, other countries may undervalue it. The CAA is available off-the-shelf with powerful, flexible tools to achieve significant emissions reductions over the next decade. But the CAA is a complicated statute, especially for those with little experience with American law. It is incremental, technocratic, and relatively difficult to explain and understand. On the other hand, EPA does estimate and monitor emissions reductions associated with its regulations, and this monitoring—so long as it is credible—may make understanding the details of US regulation less important. In any event, regulating sector-by-sector, over time makes it harder to make credible emissions reduction commitments. Even if CAA regulation is quite stringent, it may be harder to convince foreign negotiators that it will lead to more significant emissions reductions than it would be to convince them under new legislation with relatively modest goals—though of course new legislation might itself be complex and difficult to evaluate. Questions to ask:  Does new carbon legislation provide a ready basis for international negotiations?  Will other countries be able to understand and value CAA climate policy? Are other countries taking a sector-by-sector, industry-by-industry regulatory approach that parallels CAA regulation? VI. Conclusions CAA provides the set of tools being used today to build climate policy at the federal level. New carbon legislation might be politically possible, and the prospects for such legislation appear to be greater over the long term. New legislation has important advantages. The CAA is an old statute and was not designed with climate problems in mind or, with a few limited exceptions, with an appreciation of the ability of market mechanisms to address environmental problems cost-effectively. In comparison, a new policy setting a carbon price would be built around cost-effective market mechanisms. It could be simpler to administer and broader in scope, could access international emissions either through offsets or by motivating negotiations, and it could raise revenue. In addition, new carbon legislation could have symbolic advantages in that it could send a strong and unmistakable signal that the United States is addressing climate change. For these reasons and others, the ideal carbon policy would certainly reduce emissions at lower cost than a regulatory approach, especially over the long term.

#### No other climate policies solve--putting a price on carbon signals a certain and predictable commitment.

Gaspar, Keen, & Parry 16 – a. Director of the Fiscal Affairs Department of the IMF, b. Deputy Director of the Fiscal Affairs Department of IMF, c. Principal Environmental Fiscal Policy Expert in the IMF’s Fiscal Affairs Department [Vitor Gaspar, Michael Keen, and Ian Parry, Climate Change: How To Price Paris, <https://blog-imfdirect.imf.org/2016/01/11/climate-change-how-to-price-paris/>]

The Paris Agreement on Climate Change is a historic diplomatic achievement. Climate change is a global problem. Many believed that global problem solving would prove elusive: the benefits of cutting emissions arise globally while the costs of doing so are borne nationally, so national self-interest would prevent a meaningful agreement. Paris proves otherwise—creating a commonality of purpose at the global level. At the core of the agreement are the country-level emission reduction pledges and timetables that were submitted by 186 countries. The agreement also establishes procedures for updating and evaluating progress in meeting these national commitments. Governments will be under considerable public pressure to deliver. How can they make it work? As we argue in our new paper, the crucial thing is to price energy right. Getting prices right According to IMF estimates, energy prices undercharged the true costs of fossil fuel energy use—the supply costs and the damage that energy consumption inflicts on people and the environment—by a total of $5.3 trillion (or 6½ percent of Global GDP) in 2015. This estimate of global energy subsidies gives an order of magnitude of the unpriced costs that energy consumption imposes on the economy and environment. Global warming only accounts for around 25 percent of the global subsidies. The other 75 percent of the subsidies include health impacts from exposure to outdoor air pollution, and also undercharging for the local side effects (e.g., congestion) of motor vehicles, energy supply costs, and general consumption taxes. And the benefits from reducing these impacts by reforming energy prices arise, by and large, in the country doing the reform. The good news is that this also means that getting energy prices right at the national level is largely justified in terms of simple national self-interest. Pricing carbon is part of getting prices right The heart of the matter is that firms and households are not charged for the environmental consequences of their emissions, most importantly carbon dioxide (CO2) caused by burning fossil fuels. So establishing a proper charge for these emissions is critical. Pricing carbon is the way forward. The price mechanism engages the full power of human ingenuity in exploring all possible margins for mitigation: reducing energy consumption; shifting from dirtier to cleaner ways of generating energy; and, last but not least, encouraging innovation and technological change. And, in our view, taxation is generally the best way to implement carbon pricing. Ideally, this means extending fuel excises (well established in most countries, and among the easiest of taxes to administer) to include carbon charges and applying similar charges to other petroleum products, coal, and natural gas. The revenues can be used to boost the economy through, for example, cutting taxes on labor and capital that deter work effort and investment, which in turn helps to offset the drag on the economy from higher energy prices. If instead governments use emissions trading systems, these should be designed to look like taxes by auctioning allowances to raise revenue, and including price floors and ceilings. A robust, predictable emission price provides the critical signal for redirecting technological change to low-emission investments. Although the Paris mitigation pledges typically specify emissions targets, it makes more sense to meet these on average over time (with predictable prices) than rigidly meeting them year-to-year (with unpredictable prices). At the IMF, we are assessing the different types of pricing paths that countries will need to do just this. Right now, about 40 national and over 20 sub-national governments have adopted some form of carbon pricing. This is very welcome, but it only scratches the surface of the problem. These schemes cover about 12 percent of global emissions (though this will double when China prices industrial emissions in 2017) and typically with modest prices (around $10 per ton or less). Countries need to transition to greater coverage of emissions, and to prices that are better aligned with their mitigation commitments. As pricing systems continue to proliferate at the national level, at some point it will make sense for countries to enhance these efforts through international coordination. A natural way to do this would be through carbon price floor arrangements (analogous, for example, to tax minima for excises and value added taxes in the European Union). These can provide some protection against competitiveness impacts and allow individual countries, if they wish, to set prices higher than the floor. New technologies Renewables and other forms of “green technology” are getting a lot of attention from the media. Techno-optimists trumpet a new industrial revolution and governments need to support the invention and development of cleaner technologies. However, in order for these new technologies to be created and widely disseminated, firms have to be rewarded for adopting them—this is the bottom line. The most effective way to do that is to price carbon right. In the absence of such incentives, relying on technological progress to solve climate change looks a lot like banking on miracles. To follow through on the success of the Paris Agreement we need to get energy prices right and start moving now.

#### Climate spills over—it’s the bedrock of global power relations

Moore 15 (Scott, international affairs fellow at the Council on Foreign Relations President Obama’s Climate Diplomacy, https://www.brookings.edu/blog/planetpolicy/2015/01/30/president-obamas-climate-diplomacy/)

Earlier this week, President Obama made his second visit to India. As during his trip to China last year, where he signed a landmark agreement to reduce greenhouse gas emissions, climate change ranked near the top of the agenda. In New Delhi, the two governments jointly announced new initiatives to reduce India’s contribution to climate change and a breakthrough in a long-stalled agreement on nuclear power. It is striking that the climate issue, once a fringe concern in U.S. foreign policy circles, has become so central to two of America’s most important bilateral relationships. In part, this shift reflects the Administration’s genuine concern in preventing dangerous climate change. But putting climate change front and center in America’s relations with the world is also smart foreign policy. During the next few years the Obama Administration should leverage this promise by making climate change the building block of America’s relationships not just with emerging powers like China and India, but with countries around the globe. Obama’s climate diplomacy is first and foremost an attempt to persuade Beijing and New Delhi to make ambitious actions to reduce emissions in advance of crucial international climate negotiations set to take place in Paris at the end of this year. But the Administration’s focus on climate change offers new opportunities well beyond these talks. Long an important issue in the developed world, climate change has leapt to the top of the political agenda in developing countries as well. By reclaiming the leadership role that it effectively surrendered by refusing to approve the Kyoto Protocol some fifteen years ago, the United States has a rare opportunity to simultaneously cement its relationships with emerging powers, address a critical threat to stability in fragile states, and position itself at the center of the low-carbon economy that can and will power prosperity for the rest of the twenty-first century.

#### Failure of global governance results in rampant converging tech and extinction

Masciulli 11—Professor of Political Science @ St Thomas University [Joseph Masciulli, “The Governance Challenge for Global Political and Technoscientific Leaders in an Era of Globalization and Globalizing Technologies,” Bulletin of Science, Technology & Society February 2011 vol. 31 no. 1 pg. 3-5]

What is most to be feared is enhanced global disorder resulting from the combination of weak global regulations; the unforeseen destructive consequences of converging technologies and economic globalization; military competition among the great powers; and the prevalent biases of short-term thinking held by most leaders and elites. But no practical person would wish that such a disorder scenario come true, given all the weapons of mass destruction (WMDs) available now or which will surely become available in the foreseeable future. As converging technologies united by IT, cognitive science, nanotechnology, and robotics advance synergistically in monitored and unmonitored laboratories, we may be blindsided by these future developments brought about by technoscientists with a variety of good or destructive or mercenary motives. The current laudable but problematic openness about publishing scientific results on the Internet would contribute greatly to such negative outcomes. To be sure, if the global disorder-emergency scenario occurred because of postmodern terrorism or rogue states using biological, chemical, or nuclear WMDs, or a regional war with nuclear weapons in the Middle East or South Asia, there might well be a positive result for global governance. Such a global emergency might unite the global great and major powers in the conviction that a global concert was necessary for their survival and planetary survival as well. In such a global great power concert, basic rules of economic, security, and legal order would be uncompromisingly enforced both globally and in the particular regions where they held hegemonic status. That concert scenario, however, is flawed by the limited legitimacy of its structure based on the members having the greatest hard and soft power on planet Earth. At the base of our concerns, I would argue, are human proclivities for narrow, short-term thinking tied to individual self-interest or corporate and national interests in decision making. For globalization, though propelled by technologies of various kinds, “remains an essentially human phenomenon . . . and the main drivers for the establishment and uses of disseminative systems are hardy perennials: profit, convenience, greed, relative advantage, curiosity, demonstrations of prowess, ideological fervor, malign destructiveness.” These human drives and capacities will not disappear. Their “manifestations now extend considerably beyond more familiarly empowered governmental, technoscientific and corporate actors to include even individuals: terrorists, computer hackers and rogue market traders” (Whitman, 2005, p. 104). In this dangerous world, if people are to have their human dignity recognized and enjoy their human rights, above all, to life, security, a healthy environment, and freedom, we need new forms of comprehensive global regulation and control. Such **effective global leadership** **and governance** with robust enforcement powers **alone can adequately respond to destructive current global problems, and prevent new ones**. However, successful human adaptation and innovation to our current complex environment through the social construction of effective global governance will be a daunting collective task for global political and technoscientific leaders and citizens. For our global society is caught in “the whirlpool of an accelerating process of modernization” that has for the most part “been left to its own devices” (Habermas, 2001, p. 112). We need to progress in human adaptation to and innovation for our complex and problematical global social and natural planetary environments through global governance. I suggest we need to begin by ending the prevalent biases of short-termism in thinking and acting and the false values attached to the narrow self-interest of individuals, corporations, and states. I agree with Stephen Hawking that the long-term future of the human race must be in space. It will be difficult enough to avoid disaster on planet Earth in the next hundred years, let alone the next thousand, or million. . . . There have been a number of times in the past when its survival has been a question of touch and go. The Cuban missile crisis in 1962 was one of these. The frequency of such occasions is likely to increase in the future. We shall need great care and judgment to negotiate them all successfully. But I’m an optimist. If we can avoid disaster for the next two centuries, our species should be safe, as we spread into space. . . . But we are entering an increasingly dangerous period of our history. Our population and our use of the finite resources of planet Earth, are growing exponentially, along with our technical ability to change the environment for good or ill. But our genetic code still carries the selfish and aggressive instincts that were of survival advantage in the past. . . . Our only chance of long term survival is not to remain inward looking on planet Earth, but to spread out into space. We have made remarkable progress in the last hundred years. But if we want to continue beyond the next hundred years, our future is in space.” (Hawking, 2010) Nonetheless, to reinvent humanity pluralistically in outer space and beyond will require securing our one and only global society and planet Earth through effective global governance in the foreseeable future. And **our dilemma is that** the enforcement powers of multilateral institutions **are not likely to be strengthened because** of the competition for greater (relative, not absolute) hard and soft power by the **great** and major **powers**. They **seek** their **national** or alliance **superiority**, or at least, parity, for the sake of their state’s survival and security now. Unless the global disorder-emergency scenario was to occur soon—God forbid—the great powers will most likely, recklessly and tragically, leave global survival and security to their longer term agendas.

#### Our impact is 100 million times greater than nuclear war – you should vote neg even if 99% of humanity will perish

Ćirković 09 – Professor of Physics @ University of Novi Sad in Serbia and Senior Research Associate at the Astronomical Observatory of Belgrade [Milan M. Ćirković Ph.D. (Fellow of the Institute for Ethics and Emerging Technologies), “How can we reduce the risk of human extinction?,” Institute for Ethics and Emerging Technologies, September 17, 2008, pg. http://ieet.org/index.php/IEET/print/2606]

The risks from anthropogenic hazards appear at present larger than those from natural ones. Although great progress has been made in reducing the number of nuclear weapons in the world, humanity is still threatened by the possibility of a global thermonuclear war and a resulting nuclear winter. We may face evengreater risks from emerging technologies. Advances in synthetic biology might make it possible to engineer pathogens capable of extinction-level pandemics. The knowledge, equipment, and materials needed to engineer pathogens are more accessible than those needed to build nuclear weapons. And unlike other weapons, pathogens are self-replicating, allowing a small arsenal to become exponentially destructive. Pathogens have been implicated in the extinctions of many wild species. Although most pandemics “fade out” by reducing the density of susceptible populations, pathogens with wide host ranges in multiple species can reach even isolated individuals. The intentional or unintentional release of engineered pathogens with high transmissibility, latency, and lethality might be capable of causing human extinction. While such an event seems unlikely today, the likelihood may increase as biotechnologies continue to improve at a rate rivaling Moore’s Law. Farther out in time are technologies that remain theoretical but might be developed this century. Molecular nanotechnology could allow the creation of self-replicating machines capable of destroying the ecosystem. And advances in neuroscience and computation might enable improvements in cognition that accelerate the invention of new weapons. A survey at the Oxford conference found that concerns about human extinction were dominated by fears that new technologies would be misused. These emerging threats are especially challenging as they could become dangerous more quickly than past technologies, outpacing society’s ability to control them. As H.G. Wells noted, “Human history becomes more and more a race between education and catastrophe.” Such remote risks may seem academic in a world plagued by immediate problems, such as global poverty, HIV, and climate change. But as intimidating as these problems are, they do not threaten human existence. In discussing the risk of nuclear winter, Carl Sagan emphasized the astronomical toll of human extinction: A nuclear war imperils all of our descendants, for as long as there will be humans. Even if the population remains static, with an average lifetime of the order of 100 years, over a typical time period for the biological evolution of a successful species (roughly ten million years), we are talking about some 500 trillion people yet to come. By this criterion, **the stakes are** one million times greater **for extinction than for** the more modest **nuclear wars that kill “only” hundreds of millions** of people. There are many other possible measures of the potential loss—including culture and science, the evolutionary history of the planet, and the significance of the lives of all of our ancestors who contributed to the future of their descendants. Extinction is the undoing of the human enterprise. There is a discontinuity between risks that threaten 10 percent or even 99 percent of humanity and those that threaten 100 percent. For disasters killing less than all humanity, there is a good chance that the species could recover. If we value future human generations, then reducing extinction risks should dominate our considerations. Fortunately, most measures to reduce these risks also improve global security against a range of lesser catastrophes, and thus deserve support regardless of how much one worries about extinction.

#### A less than 1% risk of this impact wins the debate

Hughes 01 – Executive Director of the Institute for Ethics and Emerging Technologies [James J. Hughes Ph.D (Professor of medical ethics and research methods @ Trinity College), “Relinquishment or Regulation: Dealing with Apocalyptic Technological Threats,” Prepared for the Scientific Freedom and Responsibility Co-Curricular Initiative, Trinity College, Fall 2001, November 14, 2001]

Many critics have dismissed Joy’s concerns as “science fiction,” meaning they do not believe in the possibility of super-plagues, nanorobots and self-willed AI. But even if these threats are of very low probability, we have to take seriously even the slightest threat of so huge a catastrophic effect. I agree with Bill Joy that the **apocalyptic threats from these technologies are very real**. It may be that the likelihood of self-destruction with these technologies is one reason for the apparent scarcity of intelligent life in the galaxy. Before the first atomic chain weapon was tested at the Trinity site in Nevada, Edward Teller announced calculations showing that the test would ignite Earth’s atmosphere in an uncontrolled chain reaction. Robert Oppenheimer was so troubled that he consulted his mentor, Arthur Compton, who suggested a risk/benefit calculation that losing the war to the Nazis would be the better bet if the risk of destroying the Earth’s atmosphere was 3 in a million or more. By the time of the test, the Trinity team had proven that igniting the atmosphere was a theoretical impossibility. But how much of an impossibility is still too possible? How do we know when we have passed the three in a million chance, and is this even the appropriate level of risk to take with the future of life on the planet? How large must the potential rewards of some line of research be to gamble with human existence

### 1ac – externalities

#### Green accounting that incorporates environmental damages into cost-benefit calculations is on the brink of global adoption now, but the U.S. must demonstrate proof of concept to get developing economies on board. That solves coral reef destruction

Lisa Friedman 12, editor of ClimateWire, covers U.N. global warming negotiations, MA in Journalism from U Maryland College Park, she has won a number of journalism honors including the American Association for the Advancement of Science Kavli Science Journalism Award and the Edwin M. Hood Diplomatic Correspondence Award, “World Bank Pushes for "Green Accounting" by Nations,” April 9, http://www.scientificamerican.com/article/world-bank-pushes-for-green-accounting-by-nations/

Many nations are part of an effort to account for the economic goods provided for free by nature--but not the U.S. Botswana's diamond mining sector accounts for 31 percent of the country's economic output -- and a glistening De Beers five-diamond bracelet sells online for $1,500. But how much does depleting diamond mines cut into Botswana's overall economic health? The Philippines' untapped gold and nickel is valued at nearly $1 trillion, but the mines and refining process needed to tap them will require a great deal of water. If climate change leads to reduced rainfall in the country, how much would be lost by diverting water from agriculture? And in Australia, the government has found that pesticides used in farming are causing significant damage to the Great Barrier Reef. But how much might that damage affect the tourist economy that thrives around the World Heritage site? Those countries and a handful of others have been trying to answer precisely those kinds of questions as they develop some of the world's first "green" accounting systems. Known formally as natural capital accounting, the idea of measuring the economic value of clean water, clean air, forests and ecosystems in addition to traditional measures of the market value of a country's goods and services has been gain–ing traction since the 1980s. In February, the U.N. Statistical Commission adopted a standardized accounting method, which advocates called a major step, essentially helping environmentalists use the same language and tools that finance ministers and economists use to measure strictly in terms of national accounts. Now, with the approach in June of the U.N. Conference on Sustainable Development in Rio de Janeiro, activists hope that green accounting's time has finally come. "When it comes to natural capital accounting, we have been talking about it for 30, maybe even more years. This is something it is time to stop talking about and it is time to start implementing," Rachel Kyte, the World Bank's vice president for sustainable development, said recently. The World Bank is pushing for countries at the Rio summit, commonly called Rio+20, to commit to implementing natural accounting systems alongside their gross domestic product measurements. Kyte acknowledged that questions remain about green accounting but said countries can "learn while we're doing," and argued that the data gleaned by valuing ecosystems are critical to help governments make more sustainable decisions. Not all assets are given a value "The lack of valuation for natural resources in the environment is one of the major reasons for the continuing decline of ecosystems," said Glenn-Marie Lange, a senior environmental economist at the World Bank who leads a partnership known as WAVES (Wealth Accounting and Valuation of Ecosystem Services) aimed at helping countries develop and implement natural accounting systems. "For decades, GDP has been growing and growing in many countries, but a large segment of society hasn't been getting any better off," said John Talberth, a senior economist at the World Resources Institute. "I think we've reached a critical threshold where international consensus said we really need to move in a more deliberate and systematic manner to get better accounts up and running that reflect the true state of the economy." Those who are already trying it say natural capital accounting is slow going but they expect it to be rewarding. Australia, for example, already has a program of annual environmental accounts for water, energy, natural resources and timber, as well as subsoil assets like coal. Now it's starting to look at assets like the Great Barrier Reef to better understand what degradation caused by agriculture or climate change might mean for the country as a whole. "The Great Barrier Reef is a natural ecosystem and supports a huge tourism industry. But what is the value of the Great Barrier Reef? We're not really sure," said Michael Vardon, director of the Australian Bureau of Statistics Centre of Environment and Energy Statistics. Upstream, he noted, farmers are making decisions that are rational for their livelihoods -- using pesticides and fertilizer, for example -- and it's clear that those decisions are corroding the world's largest coral reef system. Accounting for the eco-wealth of the reef as well as for the deterioration, he said, could help the government decide to encourage farmers to plant elsewhere, or perhaps provide payments for planting trees instead of agriculture. "I think that what the accounting does is it enables you to see the costs and benefits of different courses of action," Vardon said. And in Botswana, the government is directing two initiatives to try to make the economic value of the country's natural resources tangible. Ruud Jansen, the chief technical adviser for Botswana's Ministry of Finance and Development Poverty-Environment Initiative, said the country has been working for more than a year to move out of theory and into the practice of understanding how to value the country's diamonds as well as its delta. Balancing diamonds and fresh water "In Botswana, we feel the value of our natural resources, though assumed, has not been made very clear," Jansen said. Working with both the U.N. Environment Programme and the World Bank, the government is trying to determine how much investment in keeping the delta healthy translates into freshwater availability as well as tourism dollars in Botswana, he said. Meanwhile, he said, they're also taking stock of the country's diamonds. Right now, he said, the government estimates its exportation of minerals will peak within the next decade. At the same time, there's been little work to understand exactly what the country's stock is. Once that is in hand, he said, the government can perhaps come up with a plan to regulate the export of diamonds and extend that resource's lif e span over 20 or 25 years, giving the country more time to diversify its economy. "I think it can potentially change things quite a bit. We've always had this idea that diamonds were like windfall. We were never too clear how long they were going to last or how much they would bring in on an annual basis," Jansen said. "Putting a value on these things is really going to affect decisionmaking. You can only make these decisions consciously if you have a very good idea of what is in your stocks." But the idea of green accounting hasn't been without controversy or opponents. In 2006, China dropped an attempt to develop a green GDP index, saying it was too difficult to accurately calculate a figure for GDP adjusted for the impact on the environment. Historic U.S. disinterest Yet Talbert of the World Resources Institute said Chinese leaders were primarily concerned to find that factoring in environmental degradation meant the double-digit growth rates they had been touting plummeted to 2 percent. Mary Ann Lucille Sering, secretary of the Philippines Climate Change Commission, said countries like hers that are eyeing how climate change might affect water availability want and need the tools to make new decisions about resource allocation. But, she said, many officials still need convincing. "There's a lot of interest, but what we're up against is the current paradigm, which is very much entrenched. And there's still a demand for proof in concept. Are we willing to be a guinea pig in this area which might impact GDP growth?" Sering said. The United States, meanwhile, does not do natural capital accounting on a national level, something Talbert attributed to a historic U.S. disinterest in major environmental initiatives. "In the whole world of sustainable development, the U.S. is not one of the leaders, and it never has been. It's on the margins of the international sustainable world for many years now," he said.

#### A carbon tax is the next step to bring green accounting into practice by allocating the cost of externalities to those responsible

Peter Bartelmus 12, honorary professor of the Bergische Universität Wuppertal, Germany, “Green Accounting: Balancing Environment and Economy,” May, Solutions, Vol. 3, Iss. 3, pp. 68-72, https://www.thesolutionsjournal.com/article/green-accounting-balancing-environment-and-economy/

The commonly used national accounts, therefore, focus narrowly on observable market activities and economic growth. Indicators of sustainable development, well-being, human development, quality of life, or environmental sustainability seek to show that such a focus is misleading. They combine selected concerns and statistics, deemed to be representative of our broader goals in life. All these indicators are proxy measures for something bigger than what the underlying statistics suggest. Their meaning and validity need careful examination before they can be used in policy and decision making.2 Some indicators give equal weight to unequal issues when calculating averages of, for instance, health, education, or pollution data. Other measures apply controversial money values when pricing “priceless” environmental services like waste disposal and the supply of natural resources. It is not surprising that national statistical offices are reluctant to include these indicators in their regular data collection programs. Nor is it a surprise that policymakers continue to focus on the economy and its established statistics and accounts. The national accounts provide the standard indicators of economic performance and—over time—economic growth. Gross domestic product (GDP) is just one of many national accounting indicators, but has been the focus of economic analysis and policy. It has also been accused of being a misleading measure of well-being. GDP-Bashing Is Not the Solution The popular Genuine Progress Indicator (GPI)—supposedly a measure of national welfare—famously asked: “Why is America down, when GDP is up?”3 Dismissing GDP out of hand might jump the gun, though: GDP was never designed as a measure of human well-being or national welfare. It is simply the total economic value of goods and services produced in a country during one year. The final use of goods and services by households, enterprises, and other countries balances their supply. GDP is thus not only a measure of national output but also of the uses of national output for consumption, capital formation, and net exports (minus imports). As pointed out by the Stiglitz Commission: “GDP is not wrong as such, but wrongly used.”4 The worldwide-adopted System of National Accounts5 defines and measures, among others, economic production, national income, consumption, and capital formation. Accounting equations and the use of market prices provide transparent and consistent tools for adding up the results of different economic activities, notably for the calculation of GDP. Showing the accounting results for different economic sectors (households, industries, government) makes it possible to assess production and consumption patterns and the distribution of income and wealth. GDP-bashing might throw the baby out with the bathwater—the baby being the national accounts and GDP the bathwater. There is indeed no other place where standardized measures of economic activities can be found and presented to policymakers in a meaningful “nutshell.” Individuals, corporations, and trade unions also find information on their economic situation and prospects, which they can compare with those of their own country and other nations. Seeing that the national accounts will not go away, why not go right into the accounts and adjust them? Policymakers should find it easier to accept a need for reorienting the economy when their main source of information tells them to do so. The price for this is, however, limited coverage: the national accounts include only those issues that can be readily observed, measured, and valued. This includes the interaction between the economy and the environment, but excludes less well-documented social, cultural, or institutional concerns. The System of integrated Environmental and Economic Accounting (SEEA) has been designed to assess the environment-economy interaction and, at least originally, to adjust the key economic indicators of GDP, capital, and income. The 1992 Rio Earth Summit endorsed the original SEEA.6 When measuring economic activity, the SEEA accounts additionally for the costs of hitherto ignored environmental impacts. It adjusts the standard economic indicators by further deducting these new environmental costs. Note, however, that the SEEA has now been twice revised. The latest 2012 version of the SEEA appears to reject the full adjustment of accounting aggregates as a matter of research and experimentation.7 The SEEA thus avoids being drawn into controversial measurement of well-being, happiness, the quality of life, or sustainable development. Compatibility with the national accounts should appeal to policymakers who wish to compare the conventionally measured and “greened” performance of the economy. Accounting for Sustainability: A Practical Step toward Redesigning the Economy At the heart of greening the national accounts is measuring the sustainability of economic activity and its use of the natural environment. The idea is to consider nature and its services to the economy as natural capital. The services of natural capital include, in particular, the provision of raw materials to the economy and the absorption of wastes and pollutants by environmental sinks. This allows treating the depletion of natural resources (e.g., by deforestation, mining, or overfishing) and the degradation of the environment (notably, by pollution) as capital consumption. The idea is to apply the accounting concepts of produced capital (such as roads, buildings, or machines) and their wear and tear to natural capital and its depletion and degradation. The purpose of accounting for the costs of both produced and natural capital consumption is to retain funds for replacing used-up capital goods. Produced and natural capital maintenance is the accounting definition of the sustainability of future production and consumption, in other words, of economic growth. Measuring the costs of sustainability as capital consumption allows their deduction from gross indicators of economic activity, including value added, domestic product, and capital formation. The results are an environmentally adjusted net domestic product (EDP) and environmentally adjusted net capital formation (ECF). A global application of the SEEA can illustrate the meaning of these adjustments and their results. Data gaps and different cost concepts in the available data make this a rough first study of global sustainability.8 Global environmental depletion and degradation costs amounted to about 3 trillion U.S. dollars or 6 percent of world GDP in 2006. During 1990–2006, the world economy showed similar growth rates for GDP and EDP. For such short time periods, ECF paints, however, a better picture of the potential sustainability of economic activity: it indicates the capacity to produce new capital after accounting for the loss of produced and natural capital. Figure 1 shows large differences in the sustainability of economic growth for the world’s major regions and countries. Positive ECF in industrialized countries and China shows sustainable economic growth. Negative ECF in developing countries indicates that these countries have been living off their natural and produced capital base. Overall, the world economy appears to be sustainable, at least in terms of weak economic sustainability. Weak sustainability maintains the overall monetary value of produced and natural capital. It implies that the different capital categories can be substituted in reinvesting for capital maintenance. This is the reason why some ecological economists prefer physical sustainability measures such as the carrying capacity of territories or the resilience of ecosystems to perturbations. The complexity and large variety of ecosystems make it difficult to apply such “ecological sustainability” at national or international levels.9 Produced and natural capital maintenance is a narrow but operational definition of the sustainability of economic growth. It ignores other less tangible human, social, and institutional capital categories. Measurement and conceptual problems—e.g., what is capital consumption—have so far prevented accounting for human capital (health and skills) and social/institutional capital (networking, social cohesion, law and order). Nonetheless, all these capitals have been called forth as pillars of sustainable development. International organizations use the multiple-pillar argument to explain the connections between sustainable economic growth and development. The United Nations Environment Programme’s green-economy report suggests that sustainable development can be easily translated into economic well-being: maintaining the use of all capital categories supposedly maintains economic welfare, “now and tomorrow.”10 The Organisation for Economi c Co-operation and Development’s green growth strategy is more concrete: greened economic growth, which maintains produced and natural capital, cannot replace sustainable development but is a “measurable … subset” of such development.11 In both cases, sustainability, in terms of capital maintenance, looks like the anchor that prevents us from drifting off into difficult-to-measure realms of well-being or development. The next step of actually redesigning the economy requires the allocation of the environmental sustainability cost to those households and enterprises that contributed to nonsustainability, in particular, by their environmental impacts. Well-known market instruments such as eco-taxes or pollution permits can prompt economic agents to internalize these costs in their plans and budgets. The purpose is to make them change their environmentally harmful production and consumption styles. Delayed and weak responses might make it necessary to supplement market instruments with governmental rules and regulations. Integrated environmental-economic accounts can provide the benchmarks for setting the level of market instruments and for evaluating the efficiency of sustainability policies. Greening the national accounts could unleash the greening of the economy—the leitmotiv of the Rio+20 Earth Summit.

#### Scaling up over time solves any marginal solvency deficit

Hsu 17

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Given the high levels of uncertainty about the marginal social harms from greenhouse gas emissions, setting a level of carbon taxation is thus not so much the application of economic theory to practice, but an exercise in finding some reasonable level, given political constraints. It is certainly more important that some carbon tax be imposed, even at a low level, than to get the level exactly right at the Pigouvian ideal. The U.S. government, through an interagency working group convened by the Council of Economic Advisors and the Office of Management of Budget, has estimated the current "social cost of carbon" – the marginal cost of a ton of CO2 emissions – at $42.73 To underscore the range of uncertainty, the updated 2015 analysis – which raised the analogous 2010 estimate from $26 per ton – used three different discount rates to calculate a range of social cost of carbon estimates from $11 to $56 per ton.74 While the social cost of carbon is not intended to inform a federal carbon tax, but rather to aid federal agencies in performing cost benefit analyses, the sophisticated analysis embedded in the project would seem to provide some reasonable anchor for a carbon tax level. The higher of two carbon taxes assumed by EIA in its analysis, discussed above75 -- $25 per metric ton – is a reasonable starting point. Such a level would place it on a par with British Columbia's carbon tax, which is also likely inform a national carbon price widely anticipated to take effect in Canada. Such a level would also place the United States in the middle of a global range of carbon prices, much lower than those in Scandinavian countries, but much higher than in less prosperous countries such as Mexico and Costa Rica. A carbon tax should increase over time. Economists engaged in climate policy have provided a theoretical framework for increasing a carbon tax over time. With highly uncertain estimates of damages caused by climate change, economists have more or less taken a guess as to the functional form for economic damages, and inserted what seem like reasonable parameters. The prevalent notion that a carbon tax should increase over time is driven by two stylized economic facts: (i) the discount rate – the rate at which future costs and benefits should be discounted in aggregating the many effects of climate change; and (ii) the increasing damage over time of climate change. While economists have feuded over functional form and parameter values, all agree that in the absence of sufficient climate policy, the damages from climate change increase over time. Again with Pigouvian taxation as a guide, economists widely agree that a carbon tax should increase over time.

#### Internalizing the externality of coral reef destruction is key to prevent global ecosystem collapse and human extinction

Kimberly Arsenault 6/30/16, serves at the Cleveland/Bradley County Emergency Management Agency, “Coral Bleaching: What is it and Why Does it Matter?” Emergency and Disaster Management (EDM) Digest, http://edmdigest.com/news/coral-bleaching-what-is-it-and-why-does-it-matter/

Coral reefs are living, breathing, ecosystems in the ocean that are vital to its health and balance. Referred to as the rainforests of the sea, coral reefs offer a unique and diverse ecosystem that provides food and shelter for an estimated 25 percent of all fish, crustaceans, and other sea life. Humans also benefit from coral reefs, as they provide food, medicine, shoreline protection, and tourism jobs — all of which add to the national economy. Coral reefs have an estimated value of $30 billion, with some numbers claiming close to $172 billion for the resources and products they provide. Their loss would have a significant impact to the national and global economy, and any disruption to these reefs is likely to alter ocean functions and negatively impact many other species, including fish, mammals, birds, and humans. Understanding coral reefs Coral reefs exist throughout the ocean, in both deep and shallow waters. However, reef-building corals are only found in the shallower and warmer waters of the subtropical and tropical oceans. An algae known as zooxanthellae provides a critical function to the growth and production of a reef system – it provides food to its coral hosts. These algae, which live inside the corals, are tiny and colorful, rely on the sunlight for energy, and can only tolerate small changes in water temperatures. Corals take a long time to grow — approximately one inch or less per year. The fastest growing corals gaining about six inches per year. Reefs can last for a very long time; the Great Barrier Reef is one example of a reef that has been in existence for nearly 20,000 years. Much like trees, corals produce growth rings, allowing scientists to develop a timeline for the reef’s existence. Human influences negatively impact coral reefs Coral reefs across the globe are in trouble thanks to anthropogenic (human) influences on climate change. Rising global temperatures are warming ocean waters and exceeding the acceptable temperatures for these algae. Compounding the problem is ocean acidification – a process that is caused by the ocean’s capture of carbon from the atmosphere. These two processes have different impacts on coral reefs, but both contribute to a reef’s destruction. Acidification makes it difficult for coral to build their skeletons, while warming temperatures kill the algae that provide them with food. Coral bleaching The loss of the zooxanthellae algae removes the coral’s food and color source, exposing a coral’s skeleton, making them transparent, or white. Not all corals that undergo bleaching die, but the longer the adverse conditions exist, the higher the chances the coral and the reef will die – either from disease or starvation. There are other causes of coral bleaching, such as water run-off from land, including mud and soil that is contaminated with fertilizers, pesticides, and other toxic chemicals, overfishing, and the over harvesting of corals. The impact of all the threats combined greatly increases the risks to coral reefs. However, the greatest threats to these vital ecosystems come from greenhouse gas emissions that increase atmospheric carbon levels, that then contribute to warming water temperatures and ocean acidification. Ocean protection critical for life Oceans are vital to human life and the assets, goods, and services (transportation, recreation, food, etc.) of the world's oceans are valued at nearly $24 trillion. Since the oceans also provide about 50 percent of the oxygen we need to live, and capture roughly 30 percent of atmospheric carbon, protecting them is critical to human survival.

#### Green accounting overcomes inaction on water scarcity – enables conservation

James Winpenny 12, Coordinator of the UN World Water Assessment Programe and Director of UNESCO’s Programme Office on Global Water Assessment, “Green Accounting and Data Improvement for Water Resources,” http://unesdoc.unesco.org/images/0021/002171/217165E.pdf

A number of international initiatives have been launched to promote the transition to a greener global economy. These include the UN Green Economy Initiative, the International Labour Organisation (ILO)’s Green Jobs Initiative and the OECD’s Green Growth Strategy. The common aims of these initiatives are: Lower carbon emissions Increased use of clean, renewable resources of energy More efficient use of scarce (non-renewable) resources Reduced impact of production on ecosystems Good information (a statistical database) is essential to meet these objectives. From a water standpoint, decisionmakers need a revised, macro-level model of ‘green accounting’ that contains, among other things, basic data on: Water stocks and flows Water use by households, business and other sectors The value water provides in its various uses The costs incurred in developing, protecting and restoring water resources and services How these items affect the measurement and reporting of national economic performance This is a model, in short, which links the state of environmental resources, including water, to economic and human social activity and which, ideally, gives rise to a key set of indicators that signal actions which result in progress towards a greener economy. Despite recent initiatives (e.g. UN SEEAW), national accounts largely focus on a narrow view of economic performance and growth which relegates the environment, including water resources, to the status of an externality. This focus can entrench a misperception that water resources are infinite and that business as usual (which disregards the adverse impacts of water degradation and scarcity) is a viable option.

#### Extinction

Paul Alois 7, political science professor at Baruch College, Global Water Crisis Overview, April 2007, http://www.arlingtoninstitute.org/wbp/global-water-crisis/441

Water, simply put, makes the existence of the human race on this planet possible. With few exceptions, water has always been a natural resource that people take for granted. Today, the situation has changed.¶ The World Bank reports that 80 countries now have water shortages and 2 billion people lack access to clean water.[1] More disturbingly, the World Health Organization has reported that 1 billion people lack enough water to simply meet their basic needs.[2]¶ Population growth and groundwater depletion present the two most significant dangers to global water stability. In the last century, the human population has increased from 1.7 billion people to 6.6 billion people, while the total amount of potable water has slightly decreased.[3] Much of the population growth and economic development experienced in the last fifty years has been supported by subterranean water reserves called groundwater. These nonrenewable reserves, an absolutely essential aspect of the modern world, are being consumed at an unsustainable rate.¶ 1. The Present Supply and Usage of Water¶ Humanity has approximately 11 trillion cubic meters of freshwater at its disposal.[4] Groundwater aquifers contain over 95% of this water, while rain, rivers, and lakes make up the remaining 5%.[5] Approximately 1,700 m3 of water exists for every person on the planet, an alarming low number. According to the Water Stress Index, a region with less than 1,700 m3 per capita is considered “water stressed”.[6]¶ The global supply is not distributed evenly around the planet, nor is water equally available at all times throughout the year. Many areas of the world have seriously inadequate access to water, and many places with high annual averages experience alternating seasons of drought and monsoons. (Graph 1 shows water availability per person within a country.)¶ Freshwater 2000¶ Water usage differs highly between developing countries and developed ones. Developing countries use 90% of their water for agriculture, 5% for industry, and 5% for urban areas. Developed countries use 45% of their water for agriculture, 45% for industry, and 10% for urban areas.[7]¶ In the last century water usage per person doubled, even as the total population tripled,[8] creating a situation today where many areas of the world are consuming water at an unsustainable rate. (Graph 2 highlights in red all the areas where water is being consumed at a nonrenewable rate.)¶ Water Stressed Areas¶ 2. Increasing Demand¶ The agricultural sector, by far the largest consumer of freshwater resources, accounts for 70% global consumption.[9] Irrigation consumes most of the water in the agricultural sector, and has become an integral part of modern civilization because of access to groundwater aquifers. Once farmers were freed from relying on rain to water their crops, highly efficient commercial farming became increasingly common. This innovation also underpinned the Green Revolution, which dramatically increased crop production throughout the third world in the 1960s.[10] Unfortunately, water is being drawn from many of these aquifers faster than it is being replaced.¶ The industrial sector accounts for 22% of global water consumption;[11] this number will grow in the coming decades as the developing world industrializes. The needs of industry tend to take precedence over agriculture for simple economic reasons. 1,000 tons of water will produce 1 ton of wheat, which is worth $200. 1,000 tons of water in the industrial sector, however, will generate $14,000 worth of goods. On a per ton basis, industry creates 70 times more wealth.[12] Despite its economic benefits, intense water use by industry has led to serious pollution that is beginning to create problems worldwide.¶ The residential sector uses the remaining 8% of the total water supply. Although this sector only accounts for a small percentage of overall use, it always takes precedence over industry and agriculture. In the last fifty years the world’s urban population has exploded, and by 2010 50% of the people on the planet will live in cities.[13] In addition to the simple increase in population, per person consumption of water has risen. As more people begin utilizing modern luxuries like flush toilets, showers, and washing machines, the demand created by the residential sector will increase dramatically.¶ 3. Water Pollution¶ The companion of modernization has always been pollution. In developing countries that are just entering the industrial age, water pollution presents a serious problem. According to United Nations Environmental Program (UNEP), “in developing countries, rivers downstream from major cities are little cleaner than open sewers”. The UNEP also reports that 1.2 billion people are being affected by polluted water, and that dirty water contributes to 15 million child deaths every year.[14] In recent years, scientists have become aware of the problems involved with the contamination of groundwater. Aquifers move very slowly, so once they are polluted it takes decades or centuries for them to cleanse themselves.¶ Food production contributes significantly to water contamination. When nitrogen fertilizer is applied to a field, the water runoff will contain excess amounts of nitrates. Nitrates have been shown to have a very harmful effect on plant and animal life,[15] can cause miscarriages, and can harm infant development.[16] The industrial livestock business also presents a serious danger to water systems. The disposal of vast amounts of animal feces destroys nearby ecosystems and is very hazardous to humans.[17]¶ Water pollution is reaching epic proportions. In the U.S. 40% of rivers and lakes are considered too polluted to support normal activities.[18] In China 80% of the rivers are so polluted that fish cannot survive in them.[19] In Japan 30% of groundwater has been contaminated by industrial pollution.[20] The Ganges River, which supports around 500 million people, is considered one of the most polluted rivers in the world. And the list goes on…¶ 4. Food Scarcity¶ According to the International Food Policy Research Institute (IFPRI), if current water consumption trends continue, by 2025 the agricultural sector will experience serious water shortages. The IFPRI estimates that crop losses due to water scarcity could be as high as 350 million metric tons per year, slightly more than the entire crop yield of the U.S.[21] This massive water crisis will be caused by water contamination, diverting water for industrial purposes, and the depletion of aquifers. Climate change may also play a part. The Himalayan glaciers, which feed the rivers that support billions of people, are shrinking in size every year.[22] Their disappearance would cause a major humanitarian disaster.¶ The greatest danger to global food security comes from aquifer depletion. Aquifers are an essential source of water for food production, and they are being overdrawn in the western U.S., northern Iran, north-central China, India, Mexico, Australia, and numerous other locations.[23] Additionally, many aquifers are contaminated each year by pollution and seawater intrusion.¶ Despite their importance, data on underground water reservoirs remains imprecise. There is little evidence regarding how many aquifers actually exist, and the depth of known aquifers is often a mystery. However, it is clear that water from these sources takes centuries to replenish, and that they are being consumed at a highly unsustainable rate.¶ 5. International Conflict¶ According to the UNEP, there are 263 rivers in the world that either cross or mark international boundaries. The basins fed by these rivers account for 60% of the world’s above ground freshwater.[24] Of these 263 rivers, 158 have no international legislation, and many are the source of conflict.¶ Water has always been a central issue in Arab-Israeli situation. Ariel Sharon once said the Six Days War actually began the day that Israel stopped Syria from diverting the Jordan River in 1964.[25] Decades later, the Egyptian military came close to staging a coup against Egyptian president Anwar Sedat, who had proposed diverting some of the Nile’s water to Israel as part of a peace plan.¶ The Nile River, which runs through Ethiopia, Sudan, and Egypt, exemplifies the potential for future water conflicts. The banks of the Nile River support one of most densely populated areas on the planet. In the next fifty years the number of people dependant on the Nile could double, creating a serious water crisis in the region.[26] The Nile is not governed by any multilateral treaties, and Egypt would not shrink from using military strength to guarantee its future access to water.¶ The potential for water conflicts are less likely outside the Middle East, but never the less there are many problematic areas. The Mekong River is the lifeblood of South East Asia, but it begins in one of the most water poor countries on Earth: China. The Indus River separates Pakistan and India, and aquifer depletion by Indian farmers has one of the highest rates in the world.[27] U.S.-Mexican relations are already strained over water use on their mutual border.[28] The Niger River basin in West-Central Africa runs through five countries. Surging populations coupled with decreasing rainfall in the region seriously threaten water security for millions of people.[29]

# case

## overview

### adv – warming

#### Warming is the greatest existential threat – feedback loops, resource conflicts and co-extinctions – but – the plan resolves that – it creates a monetary incentive for renewables shift and research and causes international follow on by giving the US climate leverage

### adv – pandemics

#### The aff gets tied to corporate tax cuts – that’s key to enable continued growth of US biomedical research, which is key to prevent the spread of pandemics, which reduce humanity to such low numbers that continued existence is impossible. Independently, its key to deter biological warfare from non state actors that is on the rise due to info accessibility

### adv – leadership

#### New technology coming online now – biotech, nanotech, AI – absent global leadership and regulation that results from the plan’s signaling of climate commitment, those cause rampant destruction – nanotech destroys ecosystems – biotech wipes out humanity – misuse could escalate

### adv – green accounting

#### The aff is a proof of concept for green accounting – by taking into account the social cost of carbon, it demonstrates that that method works for environmental and economic stability and protection – that enables protection of coral reefs through economic incentives, which is key to global biodiversity – that causes cascading cycles of extinction that wipe out humanity – and – it enables effective resource management of water which is key to prevent massive populations from dying due to water shortages

### ---at: cards = old

Doesn’t matter that cards are old – there’s no brightline for tech coming online – the impact slowly increases in magnitude and probability over time – but its being ignored in status quo

## framing

### 1ar – pme

#### societal moral evolution makes conflict obsolete – they have no answer – robust studies prove ascending life opportunities give rise to pro-choice values, which reduces tolerance of human casualties and one’s inclination to sacrifice their life in conflict – that’s inglehart – prefer our evidence – it’s conclusive about the causal relationship and utilizes cross-sectional, longitudinal and multi-level empirical evidence

## answers

### neocol-

non unique, mining will obviously happen in the US & util solves

### AT: CCS

#### **CCS fails and makes warming worse – empirics**

Greenpeace 16 – independent global environmental campaigning group (7/1/16, Accessed 7/23/17, “Carbon capture and storage a costly, risky distraction”, <http://www.greenpeace.org/international/en/campaigns/climate-change/Solutions/Reject-false-solutions/Reject-carbon-capture--storage/>, AD)

Carbon capture and storage (CCS) at a glance Instead of phasing out dirty energy,[130] the fossil fuel industry suggests burying billions of tonnes of carbon dioxide underground to keep it from warming the planet. Using carbon capture and storage (also called geosequestration or carbon sequestration) technologies, they claim to be able to capture carbon dioxide from power stations and industrial plant smokestacks, funnel it through pipelines, then store it permanently in underground rock formations and aquifers. An unproven and costly technology A major problem with the fossil fuel’s industry plan is that CCS doesn’t work. Only a handful of small-scale demonstration projects are operating. There isn’t a single commercial-scale power plant capturing and storing its emissions. The technology hasn’t advanced much since Greenpeace first assessed it back in 2008. Instead, CCS is floundering. High costs and technical issues have led to a wave of high profile project and program cancellations in recent years, more proof that this technology simply isn’t ready for prime time. Some of the more notable cancellations: Norway cancelled the Mongstad project in 2013 the US government pulled the plug (again) on its FutureGen CCS facility in 2015 major European utilities dropped out of the EU carbon capture platform in 2015 the UK government cancelled its £1 billion taxpayer-funded CCS competition in 2015 and the industry is all but dead in that country. Even projects that have managed to achieve operation, and been heralded as successful, are plagued with problems. The troubled SaskPower coal-fired Boundary Dam project in Canada is just one example. Cracks expose risks of carbon dioxide storage To actually deliver reductions, the emissions captured and injected must stay underground permanently. If leaked back into the atmosphere, they would only make climate change worse and threaten people and animals. Attempts to store carbon dioxide underground have only highlighted the risks. Some examples: In Salah, Algeria: One of the world's few-large scale CCS projects, In Salah [shut down indefinitely in 2011. The reason: injecting carbon dioxide into sandstone caused earthquakes. This cracked the denser overlaying rock (cap rock) that is meant to prevent the carbon dioxide from leaking out. Sleipner, Norwegian North Sea: When scientists studied the seafloor at one of the world's oldest injection sites for carbon dioxide, they found huge fractures in the region the gas was stored, and many potential paths for leakage. They concluded it is likely carbon dioxide would eventually leak from the reservoir where it is now stored. Mississippi, US: An oil company injecting carbon dioxide underground has experienced several well blowouts, which released large amounts of emissions back into the atmosphere. In one incident, the large amount of carbon dioxide released suffocated deer and other animals. As if this wasn't enough, fossil fuel companies are actively lobbying to shift responsibility and liability for storing and monitoring buried emissions to the public. Put simply, carbon dioxide storing is so risky that these polluting industries expect governments to step in and take responsibility for storage sites once they’ve closed. In the event of a leak, the people, not polluters would bear the consequences. CCS is a waste of money Another problem with CCS is the high cost of capturing, liquefying, transporting and burying carbon dioxide emissions. CCS costs at least 40 percent more than solar, 125 percent more than wind, and 260 percent more than geothermal energy for each kilogram of carbon dioxide emissions avoided (per unit of electricity generated). It is also costly in energy terms: carbon capture and storage can cut an existing coal plant’s power output by as much as 40 percent. CCS is such a bad deal industry doesn’t want to pay to make it work. They expect the public to foot the bill. But why should we spend public funds to prop up dirty, dying industries? We simply don't have time or money, especially when this takes investment away from clean, renewable energy and energy efficiency — the true industries of our future.

### 2ac – at: leakage

#### Leakage doesn’t hurt solvency

Aldy 12

Joseph E., Visiting Fellow, Timothy J. Brennan, Senior Fellow, Dallas Burtraw, Senior Fellow, Carolyn Fischer, Senior Fellow, Raymond J. Kopp, Co-Director, Molly K. Macauley, Vice President or Research, Richard D. Morgenstern, Senior Fellow, Karen L. Palmer, Research Director, Anthony Paul, Center Fellow, Nathan Richardson, Visiting Fellow and Robert C. Williams III, Director, Academic Programs, “Considering a Carbon Tax: Frequently Asked Questions,” Resources for the Future, 11—2—12, www.rff.org/blog/2012/considering-carbon-tax-frequently-asked-questions, accessed 7-31-16.

Because the U.S. emits significantly more CO2 than most other countries, reducing U.S. emissions can contribute to reducing total global emissions. However, imposing a carbon tax or other policy to reduce emissions in one country can lead to increased emissions elsewhere—a phenomenon known as carbon leakage. This occurs for a variety of reasons. First, production of some carbon-intensive goods is likely to move abroad to avoid the tax. Second, reduced U.S. demand for fossil fuels would result in lower global prices for those fuels, making them more attractive in unregulated countries. Research finds that, on average, a 10 percent reduction in carbon emissions in the United States would be partially offset by a 1 to 3 percent increase elsewhere. (See questions #4 and #5 for measures that could reduce carbon leakage.)

### 2ac – at: wrong price

#### Our starting price is correct – and – scaling up over time solves any marginal solvency deficit

**Hsu 17**

Ph.D., Agricultural and Resource Economics, University of California at Davis, 1998 M.S., Ecology, University of California, Davis, 1994 J.D., Columbia Law School, 1987 B.S., Electrical Engineering, Columbia University, 1983, Professor Shi-Ling Hsu is an expert in the areas of environmental and natural resource law, climate change, law and economics, and property. Carbon Pricing, Chapter 3 in Legal Pathways to Deep Decarbonization in the United States (Dernbach, J. and M. Gerrard, eds.) Forthcoming, FSU College of Law, Public Law Research Paper No. 860, FSU College of Law, Law, Business & Economics Paper No. 7-17, https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=3048612, msm

Given the high levels of uncertainty about the marginal social harms from greenhouse gas emissions, setting a level of carbon taxation is thus not so much the application of economic theory to practice, but an exercise in finding some reasonable level, given political constraints. It is certainly more important that some carbon tax be imposed, even at a low level, than to get the level exactly right at the Pigouvian ideal. The U.S. government, through an interagency working group convened by the Council of Economic Advisors and the Office of Management of Budget, has estimated the current "social cost of carbon" – the marginal cost of a ton of CO2 emissions – at $42.73 To underscore the range of uncertainty, the updated 2015 analysis – which raised the analogous 2010 estimate from $26 per ton – used three different discount rates to calculate a range of social cost of carbon estimates from $11 to $56 per ton.74 While the social cost of carbon is not intended to inform a federal carbon tax, but rather to aid federal agencies in performing cost benefit analyses, the sophisticated analysis embedded in the project would seem to provide some reasonable anchor for a carbon tax level. The higher of two carbon taxes assumed by EIA in its analysis, discussed above75 -- $25 per metric ton – is a reasonable starting point. Such a level would place it on a par with British Columbia's carbon tax, which is also likely inform a national carbon price widely anticipated to take effect in Canada. Such a level would also place the United States in the middle of a global range of carbon prices, much lower than those in Scandinavian countries, but much higher than in less prosperous countries such as Mexico and Costa Rica. A carbon tax should increase over time. Economists engaged in climate policy have provided a theoretical framework for increasing a carbon tax over time. With highly uncertain estimates of damages caused by climate change, economists have more or less taken a guess as to the functional form for economic damages, and inserted what seem like reasonable parameters. The prevalent notion that a carbon tax should increase over time is driven by two stylized economic facts: (i) the discount rate – the rate at which future costs and benefits should be discounted in aggregating the many effects of climate change; and (ii) the increasing damage over time of climate change. While economists have feuded over functional form and parameter values, all agree that in the absence of sufficient climate policy, the damages from climate change increase over time. Again with Pigouvian taxation as a guide, economists widely agree that a carbon tax should increase over time.

### 2ac – at: no warming

#### There’s “consensus on consensus” – warming is real and anthropogenic – alternative opinions have no backing from REAL scientists

Cook, et al. 16

(John, Climate Communication Fellow for the Global Change Institute at the University of Queensland, PhD in cognitive psychology, researching how people think about climate change, “Consensus on consensus: a synthesis of consensus estimates on human-caused global warming,” Environmental Research Letters, Volume 11, Number 4, <http://iopscience.iop.org/article/10.1088/1748-9326/11/4/048002>, CMR)

1. Introduction Climate scientists overwhelmingly agree that humans are causing recent global warming. The consensus position is articulated by the Intergovernmental Panel on Climate Change (IPCC) statement that 'human influence has been the dominant cause of the observed warming since the mid-20th century' (Qin et al 2014, p 17). The National Academies of Science from 80 countries have issued statements endorsing the consensus position (table S2). Nevertheless, the existence of the consensus continues to be questioned. Here we summarize studies that quantify expert views and examine common flaws in criticisms of consensus estimates. In particular, we are responding to a comment by Tol (2016) on Cook et al (2013, referred to as C13). We show that contrary to Tol's claim that the results of C13 differ from earlier studies, the consensus of experts is robust across all the studies conducted by coauthors of this correspondence. Tol's erroneous conclusions stem from conflating the opinions of non-experts with experts and assuming that lack of affirmation equals dissent. A detailed technical response to Tol is provided in (S1) where we specifically address quibbles about abstract ID numbers, timing of ratings, inter-rater communication and agreement, and access to ratings. None of those points raised by Tol affect the calculated consensus. Most importantly, the 97% consensus derived from abstract ratings is validated by the authors of the papers studied who responded to our survey (N = 2142 papers) and also reported a 97% consensus in papers taking a position. The remainder of this paper shows that a high level of scientific consensus, in agreement with our results, is a robust finding in the scientific literature. This is used to illustrate and address the issues raised by Tol that are relevant to our main conclusion. 2. Assessing expert consensus Efforts to measure scientific consensus need to identify a relevant and representative population of experts, assess their professional opinion in an appropriate manner, and avoid distortions from ambiguous elements in the sample. Approaches that have been employed to assess expert views on anthropogenic global warming (AGW) include analysing peer-reviewed climate papers (Oreskes 2004; C13), surveying members of the relevant scientific community (Bray and von Storch 2007, Doran and Zimmerman 2009, Bray 2010, Rosenberg et al 2010, Farnsworth and Lichter 2012, Verheggen et al 2014, Stenhouse et al 2014, Carlton et al 2015), compiling public statements by scientists (Anderegg et al 2010), and mathematical analyses of citation patterns (Shwed and Bearman 2010). We define domain experts as scientists who have published peer-reviewed research in that domain, in this case, climate science. Consensus estimates for these experts are listed in table 1, with the range of estimates resulting primarily from differences in selection of the expert pool, the definition of what entails the consensus position, and differences in treatment of no position responses/papers. The studies in table 1 have taken various approaches to selecting and querying pools of experts. Oreskes (2004) identified expressions of views on AGW in the form of peer-reviewed papers on 'global climate change'. This analysis found no papers rejecting AGW in a sample of 928 papers published from 1993 to 2003, that is, 100% consensus among papers stating a position on AGW. Following a similar methodology, C13 analysed the abstracts of 11 944 peer-reviewed papers published between 1991 and 2011 that matched the search terms 'global climate change' or 'global warming' in the ISI Web of Science search engine. Among the 4014 abstracts stating a position on human-caused global warming, 97.1% were judged as having implicitly or explicitly endorsed the consensus. In addition, the study authors were invited to rate their own papers, based on the contents of the full paper, not just the abstract. Amongst 1381 papers self-rated by their authors as stating a position on human-caused global warming, 97.2% endorsed the consensus. Shwed and Bearman (2010) employed citation analysis of 9432 papers on global warming and climate published from 1975 to 2008. Unlike surveys or classifications of abstracts, this method was entirely mathematical and blind to the content of the literature being examined. By determining the modularity of citation networks, they concluded, 'Our results reject the claim of inconclusive science on climate change and identify the emergence of consensus earlier than previously thought' (p. 831). Although this method does not produce a numerical consensus value, it independently demonstrates the same level of scientific consensus on AGW as exists for the fact that smoking causes cancer. Anderegg et al (2010) identified climate experts as those who had authored at least 20 climate-related publications and chose their sample from those who had signed public statements regarding climate change. By combining published scientific papers and public statements, Anderegg et al determined that 97%–98% of the 200 most-published climate scientists endorsed the IPCC conclusions on AGW. Other studies have directly queried scientists, typically choosing a sample of scientists and identifying subsamples of those who self-identify as climate scientists or actively publish in the field. Doran and Zimmerman (2009) surveyed 3146 Earth scientists, asking whether 'human activity is a significant contributing factor in changing mean global temperatures,' and subsampled those who were actively publishing climate scientists. Overall, they found that 82% of Earth scientists indicated agreement, while among the subset with greatest expertise in climate science, the agreement was 97.4%. Bray and von Storch (2007) and Bray (2010) repeatedly surveyed different populations of climate scientists in 1996, 2003 and 2008. The questions did not specify a time period for climate change (indeed, in 2008, 36% of the participants defined the term 'climate change' to refer to 'changes in climate at any time for whatever reason'). Therefore, the reported consensus estimates of 40% (1996) and 53% (2003) (which included participants not stating a view on AGW) suffered from both poor control of expert selection and ambiguous questions. Their 2008 study, finding 83% agreement, had a more robust sample selection and a more specific definition of the consensus position on attribution. Verheggen et al (2014) surveyed 1868 scientists, drawn in part from a public repository of climate scientists (the same source as was used by Anderegg et al), and from scientists listed in C13, supplemented by authors of recent climate-related articles and with particular effort expended to include signatories of public statements critical of mainstream climate science. 85% of all respondents (which included a likely overrepresentation of contrarian non-scientists) who stated a position agreed that anthropogenic greenhouse gases (GHGs) are the dominant driver of recent global warming. Among respondents who reported having authored more than 10 peer-reviewed climate-related publications, approximately 90% agreed that greenhouse gas emissions are the primary cause of global warming. Stenhouse et al (2014) collected responses from 1854 members of the American Meteorological Society (AMS). Among members whose area of expertise was climate science, with a publication focus on climate, 78% agreed that the cause of global warming over the past 150 years was mostly human, with an additional 10% (for a total of 88%) indicating the warming was caused equally by human activities and natural causes. An additional 6% answered 'I do not believe we know enough to determine the degree of human causation.' To make a more precise comparison with the Doran and Zimmerman findings, these respondents were emailed one additional survey question to ascertain if they thought human activity had contributed to the global warming that has occurred over the past 150 years; among the 6% who received this question, 5% indicated there had been some human contribution to the warming. Thus, Stenhouse et al (2014) concluded that '93% of actively publishing climate scientists indicated they are convinced that humans have contributed to global warming.' Carlton et al (2015) adapted questions from Doran and Zimmerman (2009) to survey 698 biophysical scientists across various disciplines, finding that 91.9% of them agreed that (1) mean global temperatures have generally risen compared with pre-1800s levels and that (2) human activity is a significant contributing factor in changing mean global temperatures. Among the 306 who indicated that 'the majority of my research concerns climate change or the impacts of climate change', there was 96.7% consensus on the existence of AGW. The Pew Research Center (2015) conducted a detailed survey of 3748 members of the American Association for the Advancement of Science (AAAS) to assess views on several key science topics. Across this group, 87% agreed that 'Earth is warming due mostly to human activity.' Among a subset of working PhD Earth scientists, 93% agreed with this statement. Despite the diversity of sampling techniques and approaches, a consistent picture of an overwhelming consensus among experts on anthropogenic climate change has emerged from these studies. Another recurring finding is that higher scientific agreement is associated with higher levels of expertise in climate science (Oreskes 2004, Doran and Zimmerman 2009, Anderegg 2010, Verheggen et al 2014). 3. Interpreting consensus data How can vastly different interpretations of consensus arise? A significant contributor to variation in consensus estimates is the conflation of general scientific opinion with expert scientific opinion. Figure 1 demonstrates that consensus estimates are highly sensitive to the expertise of the sampled group. An accurate estimate of scientific consensus reflects the level of agreement among experts in climate science; that is, scientists publishing peer-reviewed research on climate change. As shown in table 1, low estimates of consensus arise from samples that include non-experts such as scientists (or non-scientists) who are not actively publishing climate research, while samples of experts are consistent in showing overwhelming consensus.

### 2ac – at: offshoring

#### Companies won’t offshore – benefits of being in the us outweigh cost of the tax – dozens of models support this conclusion

Aldy 16

Joseph, Associate Professor of Public Policy at the John F. Kennedy School of Government at Harvard University, Visiting Fellow at Resources for the Future, Faculty Research Fellow at the National Bureau of Economic Research, and Senior Adviser at the Center for Strategic and International Studies, February 2016, “Frameworks for Evaluating Policy Approaches to Address the Competitiveness Concerns of Mitigating Greenhouse Gas Emissions,” <http://www.rff.org/files/document/file/RFF-DP-16-06.pdf>

The conventional wisdom is that environmental regulations impose significant costs, slow productivity growth, and thereby hinder the ability of U.S. firms to compete in international markets. This loss of competitiveness is believed to be reflected in declining exports, increasing imports, and a long-term movement of manufacturing capacity from the United States to other countries, particularly in “pollution-intensive” industries (133). While differential carbon prices, ceteris paribus, would result in adverse competitiveness effects, in practice everything else is not equal. Other factors determining investment, relocation, and trade may dominate the impacts of a carbon price on the inputs to production (Jeppesen et al. 2002). For example, evolving differences in labor costs or exchange rates may drive these decisions. Moreover, the continuing benefits of a firm’s current location—such as access to appropriately skilled labor, natural resources, and capital—may exceed the incremental costs of the carbon price gap (Antweiler et al. 2001). Ederington et al. (2005) illustrate how the degree to which an industry is “footloose” affects decisions to relocate to low regulatory cost countries. For example, a firm may have initially located its factories near the major markets for its goods, and the transportation costs associated with relocating to another country may not justify shifting operations abroad. These transportation costs may be even more substantial in the future if international transportation also bears a carbon price or shadow carbon value, given potential emissions mitigation regulations under the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO).1 In addition, firms in their current locations may benefit from agglomeration economies, such as from their proximity to other firms that produce their inputs or purchase their outputs. Further, the large fixed costs in factories and other physical structures may deter relocation. Ederington et al. (2005) find empirical evidence that these measures of “footlooseness” mitigate the potential competitiveness effects of environmental regulatory costs for US manufacturing firms. Since the most pollution-intensive industries tend to be relatively immobile by these measures of “footlooseness,” the empirical literature typically finds quite limited impacts of environmental regulations on international competitiveness. Levinson and Taylor (2008) show that US pollution abatement costs in the 1970s and 1980s increased net imports in the manufacturing sector from Mexico and Canada. The estimated increase in net imports roughly equaled about 10 percent of the total increase in bilateral trade for both Mexico and Canada, suggesting that other factors played much more substantial roles in the evolution of trade among the North American trading partners. An extensive literature on the competitiveness effects of environmental policies that vary in stringency across the US states has shown more significant impacts on domestic firm location and output (Henderson 1996; Greenstone 2002). Kahn and Mansur (2013) find even larger effects of energy prices on manufacturing employment when looking at adjacent counties. Deschênes (2012) also finds relatively larger labor market impacts in an analysis focused on variations in state-level electricity prices on employment across all sectors in a state-by-year statistical analysis for the United States. Deschênes (2012) estimates an electricity price–employment elasticity of –0.1 to –0.16. Based on these results, he suggests that the 2009 Waxman-Markey Bill (HR 2454, 111th Congress) would have lowered employment by about 0.5 percent. The larger domestic competitiveness effects may reflect the fact that labor costs and availability of capital do not vary much across US states and counties, and transportation costs are less important, relative to the international context. In Section 2.3, we return to these analyses by Kahn and Mansur, Deschênes, and several additional studies discussed in this section and assess their implications under a $15/tCO2 price policy. This empirical literature has focused on retrospective analyses of US environmental regulations. The absence of a domestic CO2 regulatory or taxation regime precludes taking exactly the same approach to evaluate the competitiveness effects of climate policy. The popular alternative has been to use applied computable general equilibrium models to simulate potential competitiveness impacts of pricing carbon. The US Environmental Protection Agency (EPA 2009) estimated that energy-intensive manufacturing sector imports from developing countries would increase by 1–2 percent over the first decade of the Waxman-Markey Bill.2 The Interagency Competitiveness Analysis Team (2009) estimated that a $20 per ton CO2 price would increase net imports about 1.5 percent for chemicals, cement, bulk glass, and iron and steel, and a little more than 2 percent for aluminum. Ho et al. (2008) modeled the output, consumption, and trade impacts of a $10 per ton CO2 price implemented unilaterally in the United States. They found that the CO2 price drives down manufacturing output by 1.3 percent in chemicals and plastics, 1.1 percent in primary metals, and 0.9 percent in nonmetallic minerals. Approximately half of the decline in domestic production for these industries is offset by an increase in net imports from countries that are not implementing greenhouse gas emissions mitigation policies. The Stanford Energy Modeling Forum coordinated an evaluation of border tax adjustments with a large suite of global energy-economic models developed by scholars in the United States, Europe, and Asia. This EMF-29 exercise found modest impacts of unilateral climate policy on energy-intensive manufacturing. In evaluating a unilateral climate policy that delivered, on average across a dozen models, a carbon price of about $40/tCO2, these models found that the output of energy-intensive, trade-exposed industries fell by about 2.5 percent (Bohringer et al. 2012). The impact of a price on carbon will also differ across industries depending on the extent to which they use energy, and fossil fuel energy in particular, as a production input. Aldy and Pizer (2015) employ a 35-year panel of about 450 US manufacturing industries to estimate how changes in energy prices will likely impact manufacturing output and net imports. Using the estimated energy price–output and energy price–net import relationships, they simulate the competitiveness impacts of a $15 per ton carbon dioxide price. They find that energy-intensive industries bear much larger adverse output impacts than non-energy-intensive industries under this climate policy—ranging from 3 percent to 5 percent for steel, chemicals, aluminum, cement, bulk glass, and paper industries—but the change in net imports represents no more than about one-sixth of the decline in output. The changes in production under this carbon price are dwarfed by annual variation in output in energy-intensive industries. Since the median energy intensity in the US manufacturing sector is about 1.8 percent, the average industry, prior to any adjustments in production, would experience about a 0.2 percent increase in expenditures relative to value of shipments under a $15/tCO2 price. As Aldy and Pizer (2014, 2015) show, the average manufacturing industry would experience quite small and statistically insignificant impacts on employment (–0.2 percent) and value of shipments (– 1.5 percent) under such a carbon price. In their analyses, four-fifths of the manufacturing sector would not experience statistically significant or economically meaningful impacts from a carbon price on employment or value of shipments. In contrast, the most energy-intensive industries, such as iron and steel, bulk chemicals, aluminum, cement, paper, and bulk glass, would be expected to bear statistically significant adverse competitiveness effects on employment and production. Aldy and Pizer (2014) estimate adverse employment impacts ranging from –0.4 percent to –2.2 percent for these energy-intensive industries under a $15 per ton carbon price. Aldy and Pizer (2015) find larger impacts on production, ranging from –3 percent to –5 percent for these industries. Of course, the competitiveness effects are not simply the gross reduction in employment or production. Some of these declines could reflect reductions in consumption of goods manufactured by these industries. For example, if a carbon price increases the price of steel produced by domestic firms, an automaker may choose to substitute steel from foreign firms or explore ways to economize on its use of steel in production. If transportation costs, differences in product quality, capacity constraints, or other factors limit the opportunities for increasing net imports, then the automaker may explore ways to reduce the amount of steel it uses in making a car.

### 2ac – at: solvency

#### Our solvency mechanism solves any risk of a solvency deficit – allows an informed scale-up of the tax based on most recent environmental evaluations

Aldy 17

Joseph, Visiting Fellow, Resources for the Future; Harvard Kennedy School; National Bureau of Economic Research; Center for Strategic and International Studies, Designing and Updating a US Carbon Tax in an Uncertain World, Discussion Paper January 2017  RFF DP 17-01, https://media.rff.org/documents/RFF-DP-17-01.pdf, msm

One approach to address these uncertainties would be to craft a carbon tax schedule in law that permits tax adjustments if specific conditions are realized. For example, Metcalf (2009) proposed a Responsive Emissions Autonomous Carbon Tax that would increase the growth rate in the carbon tax over time if US emissions fail to fall below specified benchmark targets. Hafstead et al. (2016) advanced this idea with their Tax Adjustment Mechanism for Policy PreCommitment, which would also modify the carbon tax rate in light of realized emissions performance. Likewise, Murray et al. (2016) discuss various ways of increasing emissions certainty under a carbon tax, including through automatic tax rate adjustments given emissions outcomes. In my proposal, I take an alternative approach. Given the challenge in specifying the full suite of conditions that reflect all important elements of uncertainty in a tax schedule, I propose a structured discretionary approach instead of the rule-based approach in Metcalf (2009) and Hafstead et al. (2016). Although these are two distinct approaches to addressing uncertainty, they are not necessarily mutually exclusive. An adjustment schedule based on emissions could be coupled with the broader review and updating considered in this paper. Before providing details about the updating proposal, let me offer a simple, illustrative carbon tax. Consider a tax that is established on the carbon content of fossil fuels, say $X per metric ton of carbon dioxide. In addition, let us assume that tax will increase Y% plus a measure of inflation (say, the urban Consumer Price Index) each year. Several congressional bills introduced over the past three years take this form. For example, the Climate Protection and Justice Act of 2015 would set a “carbon pollution fee” of $15 per metric ton of carbon dioxide in 2017 that increases a specified amount each year through 2035 and then 5% plus the rate of inflation annually thereafter.5 The Tax Pollution, Not Profits Act would set a carbon tax of $30 per metric ton of carbon dioxide in 2016 that increases 4% plus the rate of inflation each year. The American Opportunity Carbon Fee Act sets a fee of $42 per metric ton of carbon dioxide in 2015 that increases 2% plus the rate of inflation each year.7 For further details on the design of a carbon tax, refer to Aldy (2016b). To make concrete how a carbon tax could be updated, the next section describes a proposal for institutionalizing periodic review and updating of the carbon tax. Sections 3 through 5 elaborate how the review of climate science, international relations, and economics would inform the updating of the carbon tax. The next two sections address how such an approach can leverage greater emissions mitigation ambition by international partners under the Paris Agreement, provide greater predictability to the private sector, and ensure that the carbon tax mitigates the risks posed by climate change. The final section concludes. 2. The Proposal: Updating the Carbon Tax The proposed carbon tax updating occurs in three steps: reporting, proposing a congressional resolution, and taking legislative action. For the purposes of illustration, let us assume that the consideration of carbon tax updating occurs on a five-year cycle. To inform the American public and the policy debate over updating of the carbon tax, the US Environmental Protection Agency (EPA), Department of the Treasury, and Department of State would undertake analysis and submit reports to the Congress. The EPA report would focus on climate science, surveying the latest research, highlighting key uncertainties, and noting how the science has evolved since the carbon tax policy was last set. The Treasury report would focus on the carbon tax’s economic costs and benefits (net social benefits as well as distributional impacts), its cost-effectiveness, the revenue implications of the carbon tax, and the effect of the tax on carbon dioxide emissions. The State Department report would focus on the emissions mitigation efforts in other countries, the plans of other nations to update their domestic mitigation programs, and progress under the 2015 Paris Agreement. While each of these agencies would be the lead agency responsible for drafting and submitting its report to Congress, they would be expected to consult with and draw expertise from other government agencies in their assignments. Based on the key findings in these reports, the president would submit a recommendation to Congress on whether and how to adjust the carbon tax. This recommendation would be constrained by (1) applying no earlier to the carbon tax schedule than five years in the future; and (2) applying to only the level of the tax rate (X), the annual percentage change (Y), or both. The recommendation would take the form of a resolution of Congress that would not be subject to amendment. Moreover, the statute authorizing the carbon tax and this updating process would specify the legislative mechanisms such that the updating resolution could come to the floor of each house of Congress without explicit action by congressional leadership or committees of jurisdiction. The authorizing statute could also specify the number of days by which the updating resolution must be subject to floor consideration. As a revenue-oriented piece of legislation, the resolution would need to originate in the House of Representatives. In the event that Congress votes down the resolution based on the president’s proposal, then the status quo tax schedule would remain US law. The statute authorizing this presidential recommendation would provide guidance on its frequency. Specifically, Congress could direct the executive branch to report on the findings and submit a resolution for proposed changes to the carbon tax on a schedule in line with the periodic review and updating of nations’ emissions mitigation pledges (called nationally determined contributions) under the Paris Agreement.8 This would result in a review and consideration of updates to the carbon tax every five years. The congressional guidance in the authorizing statute would also call on the president to recommend an updating proposal before the next round of emissions mitigation pledging in the climate change negotiations. In this case, the review of the carbon tax could be part of the broader review and updating of the United States’ nationally determined contribution. The president could request congressional consideration of the resolution after the most recent round of emissions mitigation pledging in the international climate talks. If the pledging round results in ambitious and comparable domestic mitigation contributions by other major parties to the negotiations, the president may offer a strong endorsement of the carbon tax updating proposal. If the pledging round results in less ambitious or noncomparable mitigation actions by other countries, then the president may suggest that Congress send a signal by voting down the proposal. This approach to carbon tax updating would have several important analogues in existing regulatory, trade, and monetary policy. For example, the substantive reports from the executive branch to inform congressional action are the norm under the Congressional Review Act and trade promotion authority. Under the Congressional Review Act, agencies are required to submit the final rules and accompanying benefit-cost analysis for all “major” rules (typically based on surpassing an economic impact threshold). Members of Congress may review the rule and analysis before deciding whether to sponsor a resolution of disapproval that would effectively block the final rule from taking effect. Under the Bipartisan Congressional Trade Priorities and Accountability Act of 2015,9 a number of reports to Congress are required in consideration of negotiated trade agreements. For example, in conjunction with the submission of a negotiated trade agreement for consideration by Congress, the president must also provide supporting information that explains and justifies the agreement in light of the trade policy objectives delineated by Congress in this statute. In addition, if the president requests a three-year extension of the trade authorities’ procedures, then the president, the Advisory Committee for Trade Policy and Negotiations, and the International Trade Commission must submit reports to inform Congress in its oversight and consideration of whether to sponsor a resolution of disapproval. To facilitate the predictability of these presidential recommendations, the law authorizing the carbon tax could also require EPA, Treasury, and State to issue principles for carbon tax adjustments and "forward guidance." These agencies would identify the data and analyses that they consult in formulating their recommendation to the president and, in periodic communications, would note how they are interpreting the evolving evidence. For example, if these agencies submit a major report every five years to accompany a presidential recommendation for a resolution, then they could also issue annual reports to inform the adjustment of expectations over time. Just as the Federal Reserve System’s Federal Open Market Committee attempts to communicate its policy and the underlying evidentiary basis for its policy position so as to minimize surprises to the business and financial communities (Femia et al. 2013), these annual reports could permit firms to update expectations over the likely carbon tax proposal the president could make on the five-year updating schedule. To guide the agency development of principles, Congress could also state key principles that the agencies should employ and, as necessary, elaborate. This would be akin to guidance on negotiating objectives in trade promotion authority legislation. Constraining future legislative consideration of the carbon tax updating resolution is also analogous to how the Congressional Review Act and the Trade Act of 1974 constrain legislative consideration of regulations and trade deals. Under the Congressional Review Act, Congress may pass a disapproval resolution, which is based on a resolution template specified in the law, to preclude a regulation from taking effect.10 The disapproval resolution is time-limited, is not subject to amendment, and may be discharged out of committee without committee action. The law proscribes the use of the filibuster and limits the time for debate in the Senate. Since the mid-1970s, Congress has granted trade promotion authorities to the executive branch that allow for a trade deal to be automatically introduced through an implementing bill that would receive a vote on the floor of the Houses of Congress (Fergusson and Beth 2015). The most recent trade promotion authority law continues the use of the expedited process first authorized in the Trade Act of 1974, which requires a vote subject to a time limit, prohibits amendments to the proposed trade deal, and proscribes House Rules Committee and Senate filibuster options. In a similar way, a carbon tax statute could specify that the president’s recommendation would automatically be introduced as implementing legislation based on a statutory template. The resolution would originate in the Ways and Means Committee of the House of Representatives, and just as in the case of the trade promotion authorities, the statute could specify the nature of the rules governing amendments, the need for committee discharge, the basis for floor consideration, the length of floor debate, and the potential role of the Senate filibuster. The next three sections describe in greater detail the EPA, State, and Treasury reports that provide the basis for the presidential recommendation for updating the carbon tax and inform congressional deliberations of the updating proposal. 3. Incorporating and Communicating the Latest Insights from Climate Science A carbon tax is intended to drive emissions reductions and mitigate the risks posed by climate change. While the effects of anthropogenic greenhouse gas emissions on the global climate are well understood in the relevant scientific disciplines, there are still important uncertainties about the timing, location, and severity of climate change impacts. As scientific research continues and the world warms in response to higher atmospheric concentrations of greenhouse gases, some of the uncertainties about climate change impacts will be resolved. Reviewing and synthesizing the latest insights from climate science can provide a key evidentiary basis for the carbon tax policy. Learning about climate science could highlight whether the carbon tax and its trajectory under current law would be too high, too low, or about right. For example, if the innovations in climate science suggest that climate change is becoming worse than predicted based on our earlier understanding, then that would serve as the basis for calling for a higher carbon tax (or greater rate of annual increase). If climate research suggests the opposite, then it may motivate a decision for a lower carbon tax.

### 2ac – at: too late

#### Not too late but now is key – most recent IPCC report

Gohd 9-27-19

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Yesterday (Sept. 25), a stark new climate report came out that showed climate change is progressing much faster than anticipated, but it's not too late for humans to make changes. The report, written and released by the United Nations-led Intergovernmental Panel on Climate Change (IPCC), and formally known as the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, details the most up-to-date understanding of climate change, its causes, how it will continue to impact us on Earth and what we can do about it. The report looks to 2100 to see both where we will be if we continue on as we currently are, or if major changes are made to mitigate contributing factors like carbon dioxide emissions. The main takeaway from the report? "We're seeing that climate change impacts are already happening, were seeing that they're happening at a faster pace than before," Ben Orlove, a professor of public policy at Columbia University and a lead author on the report, said to Space.com at an Explorer's Club event in New York on Sept. 25, where scientists, including authors of the report, discussed the report and its implications. This harsh reality is "true in the oceans, sea levels are rising, the oceans are turning more acid[ic], they're losing the oxygen that's required to support life. We're seeing glaciers melting on every continent of the world. Antarctica and Greenland [are] also losing their ice. These are serious problems," Orlove added. "We've been able to look ahead to 2100 and to distinguish what happens if we cut back on greenhouse gases soon or if we do not. And there's an enormous difference. It'd be much easier to cope with the changes that will come by 2100 if they're smaller." "This report is built on the science we need to guide us in adapting to a changing environment and, most importantly, to avert a planetary disaster … The findings of the new IPCC report need to be known and not only known but understood by me and all of my colleagues in government and politics around the world," Katrín Jakobsdóttir, the prime minister of Iceland, said at the event. The report was clear in showing how, if we continue behaving in a "business-as-usual" fashion, climate change and its consequences will continue to grow to unprecedented extremes. "The report does not prescribe telling anyone what to do. But we can show the consequences of those actions," Orlove said. Tropical storms becoming both more severe and more frequent will be just one of many realities that we will face. It is apparent in the report that, seeing as we are already experiencing the consequences of climate change, there is no way to avoid its effects. Hope? However, while this might seem like a "doomsday" report to some, the authors were surprisingly optimistic in showing that, while the details of progressing climate change are sobering, we can do something about it. In the report, there is a figure, pictured above, which shows graphs with a red line and a blue line. The red line shows the progression of climate change if we don't change anything, and it goes sharply up in all cases (except for ocean acidification because in that graph the pH is dropping). But the blue line is where there is hope. This line, which doesn't increase sharply and instead looks almost straight, shows what will happen is we make major changes to human activity as it relates to climate change. "You don't turn the ice sheets around in decades or even centuries. But you can see it's a much, much rosier picture with perhaps less than a meter of sea level rise even centuries out into the future, and that's something that I think we can all probably deal with and tolerate," Robert DeCanto, a lead author on the polar regions chapter of the report, said about the possibility to change our future with dramatic mitigation of human activity affecting climate change. So, while this report is a sobering reminder that we are causing climate change, which will continue to threaten and take human lives around the world, the report's authors say we can do something about it.

#### Even if some climate change is locked in, rapid mitigation now prevents catastrophic impacts – adaptation alone fails

Pancost 16

(Professor Rich Pancost, organic geochemist, biogeochemist and palaeoclimatologist. Director of the interdisciplinary University of Bristol Cabot Institute, August 2, 2016. “Climate Change: Mitigation or adaptation?” <https://preventablesurprises.com/blog/climate-change-mitigation-or-adaptation/>)

Now, as then, the sole focus on adaptation is deeply flawed. Let’s start with those arguing that either the mitigation opportunity has passed by or that nations will be unwilling to enact the perceived painful policies necessary to limit warming. Aside from the ethical flaws of this argument, it would be naive for investors to assume that an agreement among nearly 200 nations will have no legal or policy consequences; even the INDCs, though they are incomplete measures, will require vast social, economic, and political change. However, the central argument that mitigation remains vital and necessary is scientific. Those suggesting that mitigation has failed or will fail tend to fixate on the 2°C global warming limit at the centre of policy discussions for the past decade and the acute challenge we face in achieving it. There are good reasons to have a 2°C (or lower) limit, as that is the representative temperature when a number of system changes begin to occur, very high sea level rise becomes locked in, and changes in weather, including extreme events, becomes very difficult to predict, all of which will have dramatic economic and social impacts. Climate change, however, is not a binary. We are already experiencing the consequences of anthropogenic climate disruption. These will become more pronounced as the planet approaches 2°C of warming. And they will become even worse at higher CO2 levels and higher global temperatures. The Earth system does have some bimodal features but the tipping points between them occur at a range of temperatures, with great uncertainty, and in complex ways. Sea level rise showcases this well. In the Pliocene era, about 3 million years ago, CO2 levels were 400 to 500 ppm; temperatures were 2°C higher; and the sea level was 5 to 20 metres higher than today. Such changes would be devastating in modern times, with huge infrastructure costs, long-term economic consequences, and unprecedented social displacement. The last time Earth experienced 500 to 1000 ppm CO2, however, temperatures were about 4-5°C higher, and sea level was 70-100 metres higher than today. These represent a long-term Earth system equilibrium so neither scenario is expected for the next several hundred years or more; but they are illustrative of the profound differences between a 2°C and 5°C global warming scenario. Crucially, unabated biomass loss and fossil fuel burning—especially with new technologies allowing unconventional shale gas and tar sands to be exploited—could result in warming of 5 to 6°C, maybe even more depending on how effective we are at tapping new reservoirs, whether climate sensitivity is at the high or low end of our estimates, and whether positive feedbacks in the Earth system will exacerbate our fossil fuel impacts. To the best of our understanding, 5 to 6°C global warming will have vast and devastating impacts on our climate and ecosystems, probably with similarly devastating impacts on society. In short, even if we fail to sufficiently curtail fossil fuel usage to limit global warming to 2°C, we must certainly do so to prevent far more extreme warming. As long as fossil fuel resources exist to tempt us, mitigation will always be a priority. And yet. Even under our most ambitious mitigation strategies, climate change will happen and we must adapt to it. Already, with the Earth having experienced only about 1°C warming, droughts, floods and heat waves—many of which have been directly attributed to global warming—are occurring. When that warming has combined with natural climate variability, which happened with the strong El Niño of this past year, local affects are even more pronounced, whether it be global coral bleaching or crippling heat waves in the tropics. These events, in turn, have affected food security, productivity and global security. They could destroy marine ecosystems and in turn one of our most important food sources and one of nature’s most beautiful features. And yet, we are committed to further emissions, further warming, and further climate disruption. It is hoped that if we limit warming to 1.5°C, the most severe aspects of sea level rise, extreme weather and ecosystem disruption will be avoided—but we do not know that and some have argued that we have already locked in up to 4 metres of sea level rise. If we limit warming to 2°C, we will almost certainly have to adapt to sea level rise, human displacement, infrastructure devastation; it will also expose us to feedback risks that could add additional warming beyond our direct influence. There is no choice between avoiding severe climate disruption or adapting to it. We will do both. We will leave fossil fuel assets in the ground and we will adapt to some environmental disruption. The only choices we have are how we balance those two needs, how we do so fairly, and how rapidly we make the inevitable transition.

### 2ac – at: trump

#### Trump doesn’t kill warming solvency

Victor 16

David Victor, professor at the University of California, San Diego, where he co-leads the Deep Decarbonization Initiative and the Laboratory on International Law and Regulation. He is also co-chair of the Brookings Institution’s Initiative on Climate and Energy., MIT Technology Review, How Bad Will Trump Be for Climate Policy?, (November 14, 2016), <https://www.technologyreview.com/s/602852/how-bad-will-trump-be-for-climate-policy/?utm_campaign=internal&utm_medium=readnext&utm_source=item_1>

Before declaring that the planet’s climate will be an automatic loser from the Trump presidency it is crucial to keep three things in mind. First, nobody really knows Trump’s views on climate change—perhaps not even Trump himself. Much has been made of the 2012 claim that climate is a “hoax” invented by the Chinese to steal American jobs. But that message came from a tweet—hardly the stuff of reasoned policy analysis—and was embedded in the larger narrative that helped Trump win the White House: economic malaise, especially in the rust belt hurt by global competition. Reframe climate policy and the automatic conflict with economic competitiveness will dampen. Indeed, that reframing is exactly how the Clinton candidacy tried to push hard on climate change while also offering a pro-jobs message. Second, climate diplomacy under Trump could be a lot like that of the George W. Bush administration. One of Bush’s first foreign policy actions was to abandon the Kyoto Protocol—a decision led by Vice President Dick Cheney, who was openly hostile to climate science and policy. Later that year September 11 happened and the Bush foreign policy became consumed with terror. More quietly, however, the Bush team also sought to build a climate policy based on cooperation in smaller groups rather than UN forums and focused on innovation and deployment of new technologies. That approach was the right one—if not fully executed—and a Trump administration will find many allies ready to coöperate in small group settings. Activists should get ready to criticize Trump if his administration fails to act on climate change, but holding out the promise that action will come through global UN forums is a recipe for deadlock with Trump. I remain worried about the health of the UN process nonetheless. That process is important because a global umbrella is essential for legitimacy, and building an effective system of pledge and review is essential for the long-term effort to deepen coöperation. Don’t look for Trump to love the UN, but if his team does not actively undermine the Paris process, that will be a success. Now, more than ever, the United States civil society needs to engage with other like-minded countries so that the U.S. is involved with the development of the Paris process even if the formal government of the country becomes AWOL. U.S. environmental groups have a huge stake in an effective process, as do globally oriented U.S. firms that will face a much costlier compliance regime in the future if the Paris process fails. Third, what the U.S. does to the world depends not just on leadership but on how we actually behave at home with policies to control the gases. Here, the impact of Trump will be a lot less than feared. Established policies like the Clean Power Plan will be hard for Trump to reverse unilaterally. Much of what the United States is actually doing on climate change is rooted in state policy and in federal incentives that are extremely popular—such as subsidies for renewable power—and unlikely to change much. Nobody who closely studies U.S. energy markets thinks that Trump’s bold claims of rebuilding the coal industry are serious. At least for the next four years, the trajectory of U.S. emissions is unlikely to wiggle much no matter who sits in the White House.

## turns

### 2ac – at: green paradox

#### no green paradox – their models are flawed

Cairns 14

(Robert D., Department of Economics and Cireq, McGill University, “The green paradox of the economics of exhaustible resources,” Energy Policy, Vol. 65, February 2014, pg. 78-85)

In short, **Hotelling models of the green paradox are oversimplified**. There are in reality two incentives that work in opposite directions, in complicated ways. The resultant of the two depends on assumptions. If the prediction of Hotelling models is right and the equilibrium price does fall in the near to medium term, then a price-taking firm has an **even greater incentive** to reduce exploration and development than under the assumption, made above, that the price path is not affected. The microresponse of producers appears to be **inconsistent with** the macroeffect on price, and hence on output and **emissions**. 10. Conclusion Hotelling’s rule is a result from a simple model that teaches that non-renewable resources are a form of capital and that they should be analysed as such. His important insight concerning far-sighted decision making reigns as a foundation of non-renewable resource economics. Hotelling may reign but he does not rule. Models in his tradition assume free allocation of resources over time. The rule is an arbitrage condition relating the values of net price over the productive life of the reserve. Empirical evidence suggests that allocation is **subtler** than in the Hotelling model. The operative constraint in oil industry is that allocation over time is capped in one of a number of ways, so that arbitrage among periods is constrained. Calculations and comparisons are not simply of current costs at different time periods but of commitments, especially sunk costs, predicated on the entire future of operations. At each instant in Hotelling models, decisions are made about the level of flow of units of the resource. Technological models break qualitatively from type-one and -two Hotelling models concerning the form of decisions in the oil industry. Decisions about flows are atrophied. Extraction requires a combination of a discovered reserve with fixed capital. The fundamental decisions are about the timing and level of investments in exploration and development. The present analysis is still **highly simplified**. Features of **several aspects** of oil production must be stitched together if one wishes to begin to analyse the dynamics of the industry in a way that is **relevant to policy**. Some of these features have been pointed to herein. Some are becoming more fully understood. Each, to have **credibility for policy analysis**, requires **long and deep research. It is not possible to demonstrate a green paradox** given the current limitations of mathematical analysis of a complicated, multi-faceted industry. The weight of many influences discussed in the present paper is inimical to its predictions. The paradox **does not have an adequate foundation** in the conditions of production in the oil industry to **affect policy** or the timing of policy respecting climatic change.

## new warming impacts

### 1ar – aids

#### Global warming spreads AIDS and makes new resistant strains

AN, Age News, 2008 [April 29. “Global warming set to fan the HIV fire.” http://news.theage.com.au/national/global-warming-set-to-fan-the-hiv-fire-20080430-29eh.html]

Climate change is the latest threat to the world's growing HIV epidemic, say Australian experts who warn of the "grim" outlook in the fight against the infectious disease. A leading professor of health and human rights, Daniel Tarantola, has cautioned that global warming will indirectly make citizens of developing countries even more vulnerable to death and severe ill health from HIV/AIDS. "It was clear soon after the emergence of the HIV epidemic that discrimination, gender inequality and lack of access to essential services have made some populations more vulnerable than others," said Prof Tarantola, of the University of NSW. Those problems had not gone away, he said, and extra threats were lurking on the horizon "as the global economic situation deteriorates, food scarcity worsens and climate change begins to affect those who were already dependent on survival economies". "Climate change will trigger a chain of events which is likely to increase the stress on society and result in higher vulnerability to diseases including HIV," said Prof Tarantola, due to address an HIV forum in Sydney. Prominent HIV scientist Professor David Cooper, director of the National Centre in HIV Epidemiology and Clinical Research, agreed environmental change would have a negative impact on HIV sufferers. "Climate change will lead to food scarcity and poorer nutrition, putting people with perilous immune systems at more risk of dying of HIV, as well as contracting and transmitting new and unusual infections," Prof Cooper said.

#### Extinction

Mathiu 2k [Mutuma, Africa News, July 15, http://209.85.165.104/search?q=cache:6tm \_9OIp 4c8J :www. healtoronto.com/Mbeki

/Kommentare.rtf]

Every age has its killer. But Aids is without precedent. It is comparable only to the Black Death of the Middle Ages in the terror it evokes and the graves it fills. But unlike the plague, Aids does not come at a time of scientific innocence: It flies in the face of space exploration, the manipulation of genes and the mapping of the human genome. The Black Death - the plague, today easily cured by antibiotics and prevented by vaccines - killed a full 40 million Europeans, a quarter of the population of Europe, between 1347 and 1352. But it was a death that could be avoided by the simple expedient of changing addresses and whose vector could be seen and exterminated. With Aids, the vector is humanity itself, the nice person in the next seat in the bus. There is nowhere to run and nowhere to hide. Every human being who expresses the innate desire to preserve the human genetic pool through the natural mechanism of reproduction is potentially at risk. And whereas death by plague was a merciful five days of agony, HIV is not satisfied until years of stigma and excruciating torture have been wrought on its victim. The plague toll of tens of millions in two decades was a veritable holocaust, but it will be nothing compared to the viral holocaust: So far, 18.8 million people are already dead; 43.3 million infected worldwide (24.5 million of them Africans) carry the seeds of their inevitable demise - unwilling participants in a March of the Damned. Last year alone, 2.8 million lives went down the drain, 85 per cent of them African; as a matter of fact, 6,000 Africans will die today. The daily toll in Kenya is 500. There has never been fought a war on these shores that was so wanton in its thirst for human blood. During the First World War, more than a million lives were lost at the Battle of the Somme alone, setting a trend that was to become fairly common, in which generals would use soldiers as cannon fodder; the lives of 10 million young men were sacrificed for a cause that was judged to be more worthwhile than the dreams - even the mere living out of a lifetime - of a generation. But there was proffered an explanation: It was the honour of bathing a battlefield with young blood, patriotism or simply racial pride. Aids, on the other hand, is a holocaust without even a lame or bigoted justification. It is simply a waste. It is death contracted not in the battlefield but in bedrooms and other venues of furtive intimacy. It is difficult to remember any time in history when the survival of the human racewas so hopelessly in jeopardy.

### 1ar – central asia

#### Climate change sparks wars in Central Asia

Epiney et al 2007, [Dr. Astrid, professor for international law, european law and swiss public law, director at the Institute for European Law, Université de Fribourg (Switzerland); Prof. Dr. Nina Buchmann, professor of Grassland Science, Institute of Plant Sciences, ETH Zurich (Switzerland); Dr. Rainer Grießhammer, member of the management board of the Institute of Applied Ecology, Freiburg and director of the future heritage foundation (Stiftung Zukunftserbe); Prof. Dr. Margareta Kulessa, professor of International Economics, University of Applied Sciences, Mainz; Prof. Dr. Dirk Messner, director of the German Development Institute, Bonn; Prof. Dr. Stefan Rahmstorf, professor of Physics of the Oceans, Potsdam University and head of the Climate System department at the Potsdam Institute for Climate Impact Research; Prof. Dr. Hans Joachim Schellnhuber CBE (vice chair), director of the Potsdam Institute for Climate Impact Research and visiting professor at Oxford University (physics department and Christ Church College); Prof. Dr. Jürgen Schmid, president of the Institute for Solar Energy Technology and professor at the University of Kassel, Head of the department for efficient energy conversion; Prof. Dr. Renate Schubert (chair), professor for economics at the Swiss Federal Institute for Technology and director of the Institute for Environmental Decisions, ETH Zurich (Switzerland), German Advisory Council on Global Change, “Climate Change as a Security Risk,” <http://www.wbgu.de/wbgu_jg2007_engl.pdf>]

Central Asia is an area prone to conflict. All the countries of Central Asia are characterized by a major democracy deficit, autocratic and paternalistic forms of government and weak governance structures (Kaufmann et al., 2006; Grävingholt, 2007). The post-Soviet political institutions lack legitimation and fail to operate in accordance with the rule of law. Inefficient public administration and widespread corruption hinder economic and social development. Unmet material and participative needs fuel discontent among the population, leading increasingly to internal political conflict. Political tensions usually have ethnic or religious undercurrents, because the region is home to a variety of ethnic groups and Islamic opposition movements are growing in strength (Lüders, 2003). Arbitrary border- drawing between the areas occupied by different ethnic groups further exacerbate the situation. In consequence, the internal stability of these countries has been repeatedly shaken in the recent past by terrorist campaigns (Uzbekistan), civil war (Tajikistan) and criminal penetration of politics. On account of their poor governance capacities, many countries are regarded as so weak and fragile that it would take little in the way of critical events for the state to collapse. The unstable internal situation is compounded by global developments: the geostrategic importance of the region has increased as a result of the ‘ war on terror’ (Halbach, 2002). On account of its proximity to Afghanistan, Central Asia is regarded, moreover, as a hub of the international drugs trade. In addition, in connection with the securing of global resources and energy supplies, this resource-rich region is increasingly caught up in the potentially conflicting interests of powers such as the USA, Russia and China (Lüders, 2003; Amineh, 2006). The region is characterized in some places by great poverty. For example, the proportion of the population living below the poverty line of less that US$2 per day is 16 per cent in Kazakhstan, 21 per cent in Kyrgyzstan and as high as 43 per cent in Tajikistan (World Bank, 2006e). The Human Development Indices of theses countries are close together, all lying in the lower part of the middle range (UNDP, 2006). The sole exception is Kazakhstan, which scores better than its neighbours. A large proportion of the population of Central Asia is affected by unemployment and struggles for opportunities to earn a living. Kazakh stan, Uzbekistan and Turkmenistan are the only countries in which the state fulfils its welfare obligations, and then only at a very low level (Schmitz, 2004). At the same time, there are extremely wide social differences in these three countries, with a large proportion of the profits from gas and oil exports benefiting only a small, affluent minority. Economic structures depend to a large extent on natural resources. In addition, these countries still have to contend with inefficient management structures created for a planned economy; this is particularly significant for the supply of water. Agriculture forms the basis of existence for large sectors of the population and accounts for up to 40 per cent of GDP. The proportion of agricultural land requiring irrigation is 75–100 per cent (Bucknall et al., 2003; Giese and Sehring, 2006). The non-sustainable monoculture has far-reaching consequences, including soil salination, declining availability of pasture and arable land and contamination of water with fertilizers and pesticides. In addition, the large-scale abstraction of water from the Syr Darya and Amu Darya rivers has led to a gradual silting up of the Aral Sea, with disastrous consequences for climate and environmental conditions in the region and the health and socio-economic situation of the population (WBGU, 1998). Health problems caused by impure drinking water and sandstorms, high unemployment and impoverishment have fuelled social unrest and migratory movements in the region. The allocation of scarce water supplies, combined with controversial measures such as the building of the Golden Century reservoir, places strain on relationships between Uzbekistan and Turkmenistan and between Uzbekistan and Kazakhstan. Because of the anticipated affects of climate change in the Aral Sea region, the potential for destabilization is therefore particularly high (Giese and Sehring, 2006). In addition to agriculture, another important economic sector is the generation of hydroelectricity for both the domestic and – increasingly – the export market. With regard to the use and distribution of water, there is sometimes a divergence of interest between countries adjoining the upper and lower reaches of rivers that flow through different states: for example, the requirements of electricity generation in winter (Kyrgyzstan, Tajikistan) as opposed to agricultural irrigation in summer (Uzbekistan, Kazakhstan, Turkmenistan). Since the Central Asian republics gained political independence, these differences of interest between riparian countries has resulted in more interstate disputes over water throughput quantities. Increased worsening of the water supply situation in summer would significantly increase the existing potential for conflict and far overtask current regional water management structures such as the Interstate Commission for Water Coordination, which was later included in the International Fund for Saving the Aral Sea (Section 6.2.3.2). A part of Central Asia that is particularly prone to conflict is the Fergana basin. This is the most important area of agricultural cultivation and the most densely populated part

#### Global nuclear war

Blank 1998, MacArthur Professor of Research at the Strategic Studies Institute of the US Army War College [Stephen, Jane’s Intelligence Review, May 1]

Many of the conditions for conventional war or protracted ethnic conflict in which third parties intervene are present in the Transcaucasus. For example, many Third World conflicts generated by local structural factors have a great potential for unintended escalation. Big powers often feel obliged to rescue their lesser proteges and proxies. One or another big power may fail to grasp the other side's stakes, since interests here are not as clear as in Europe. Hence commitments involving the use of nuclear weapons to prevent a client's defeat are not well established or clear as in Europe. Clarity about the nature of the threat could prevent the kind of rapid and almost uncontrolled escalation we saw in 1993 when Turkish noises about intervening on behalf of Azerbaijan led Russian leaders to threaten a nuclear war in that case. Precisely because Turkey is a NATO ally but probably could not prevail in a long war against Russia - or if it could, would trigger a potential **nuclear blow** (not a small possibility given the erratic nature of Russia's declared nuclear strategies) - the danger of major war is **higher here** than almost everywhere else.

## at – warming good

### AT: Ice Age

#### No ice age – sun minima wrong and climate change comparatively larger threat

Clark 13 [Stuart, first class honours degree and a PhD in astrophysics, Fellow of the Royal Astronomical Society, former Vice Chair of the Association of British Science Writers, “Sun's Quiet Spell Not the Start of a Mini Ice Age,” New Scientist, 7/24, <http://www.newscientist.com/article/dn23865-suns-quiet-spell-not-the-start-of-a-mini-ice-age.html#.UfMGO42fgRs>]

Those hoping that the sun could save us from climate change look set for disappointment. The recent lapse in solar activity is not the beginning of a decades-long absence of sunspots – a dip that might have cooled the climate. Instead, it represents a shorter, less pronounced downturn that happens every century or so. Sunspots – dark patches that appear on the sun's surface due to intense magnetic fields – are the seat of solar activity and can affect Earth's climate in a number of ways, although the size of the effect is debated. They virtually disappeared between 1645 and 1715, a period now known as the Maunder minimum. Simultaneously, Northern Europe experienced the worst winters of the Little Ice Age, a period of exceptionally cold weather that began in the 16th century, leading some to suggest that a similar, prolonged sunspot minimum could offset global warming. Sunspot numbers wax and wane in a natural cycle that lasts 11 years or so. The current cycle is meant to be at its peak now, but sunspots have been scarce, leading to speculation that we were about to enter another Maunder minimum. New type of cycle The latest comparisons between the ongoing maximum and historical data suggest this isn't so. "Cycle 24 [the present one] is different, but it is not an indication that we are going into a Maunder minimum," Giuliana DeToma of the High Altitude Observatory in Boulder, Colorado, told the American Astronomical Society's Solar Physics Division meeting in Bozeman, Montana, yesterday. Instead, the sun's recent activity is more akin to a short series of weak cycles at the beginning of the 19th and 20th century. Unlike the decades-long break of the Maunder minimum, those reductions in sunspots lasted for just one or two cycles and were less dramatic. In 1933, Wolfgang Gleissberg predicted that these minor dips should occur regularly, every century. The latest measurements seem to confirm them, throwing up a new facet of the sun's magnetic dynamo to investigate – the Gleissberg cycle. "We're in a new age of solar physics," says David Hathaway of NASA's Marshall Space Flight Center in Huntsville, Alabama, who analysed the same data and came to the same conclusion. "We don't know why the Gleissberg cycle takes place but understanding it is now a focus." Dud repeat As for when the next Maunder minimum may happen, DeToma will not even hazard a guess. "We still do not know how or why the Maunder minimum started, so we cannot predict the next one." Paul Charbonneau of the University of Montreal, Canada, who was not involved in the latest analysis, agrees with their conclusions. "Even though many people have claimed that we may be going into a grand minimum, nothing I have heard or read I found particularly convincing," he says. According to the Gleissberg cycle, the next solar maximum – in about 2024 – will probably be a dud too, but then cycles will become more energetic once again, and any cooling effect the brief downturn has had on Earth's climate will also vanish.

#### CO2 isn’t key to prevent an Ice Age

WND 7 (World Net Daily, “Study Finds CO2 Didn’t End Ice Age”, 9-29, <http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=57895>)

A new peer-reviewed scientific study counters a major premise of global warming theory, concluding carbon dioxide did not end the last ice age The study, led by University of Southern California geologist Lowell Stott, concluded deep-sea temperatures rose 1,300 years before the rise in atmospheric CO2, which would rule out the greenhouse gas as the main agent of the meltdown. "There has been this continual reference to the correspondence between CO2 and climate change as reflected in ice core records as justification for the role of CO2 in climate change," said Stott. "You can no longer argue that CO2 alone caused the end of the ice ages." Another new study published in Science refutes the "Hockey Stick" temperature graph, used by man-made global warming theorists such as former Vice President Al Gore to argue for a recent spike in average global temperature after centuries of relative stability. Stott's new study suggests the rise in greenhouse gas likely was a result of warming. It may have accelerated the meltdown, he says, but was not its main cause. He cautioned that the study does not discount the role of CO2.

### AT: SO2 Screw

#### Aerosol decline inevitable – coal collapse

Lazarus 16 [Richard Lazarus, the Howard and Katherine Aibel Professor of Law at Harvard Law School 2-26-2016 <http://news.harvard.edu/gazette/story/2016/02/clean-power-plans-legal-future-a-mess/>]

GAZETTE: So the EPA is saying that they have to look at the whole system because the only way you’re going to reach the emissions goal is by taking coal out and increasing contributions from these other cleaner sources?

LAZARUS: Yes, but it’s important to recognize that the Clean Power Plan actually doesn’t assume that coal goes away. There would be a significant reduction of the electricity that coal will supply. A lot of that is happening anyway, because of the price of natural gas. The coal industry feels like it is under siege. But a lot of what they’re blaming on the Clean Power Plan is in fact just the result of free-market forces responding to dramatically lower natural-gas prices.

There’s one other significant legal issue in the case. I don’t view it as significant as the first one, but others might disagree. There’s this very odd issue, involving the relationship between two provisions of the Clean Air Act: section 112, which restricts hazardous air pollutants from sources such as power plants, and section 111, which generally allows for regulation of existing sources such as coal-fired power plants. In 1990, when Congress amended the Clean Air Act with hundreds of pages of new provisions, the House and the Senate each decided to change the language of section 111 to coordinate it with section 112 to make sure there wasn’t duplication between the two. To that shared end, the House passed some language and the Senate did the same, but each chamber passed different language. Normally, of course, when that happens, the House and Senate get together reconcile their differences in conference and then one version is passed by both chambers. This time, they forgot to do that. The discrepancy seems to have simply been overlooked in the hundreds of pages of the 1990 legislation. So they didn’t notice, in this big bill, that they had both addressed the same language. So both versions simultaneously passed Congress, both were signed by the president of the United States, so they both became law. The problem of course is that they can be read to say different things. The Senate language clearly says that if a pollutant is regulated under section 112 then it can’t be regulated under section 111. If that’s what it means, which is what EPA says, it’s easy because greenhouse gases aren’t regulated under section 112. The coal plants say, though, that the House version can be read to say if a source is regulated under section 112, then that same source can’t be regulated under section 111. That means that if coal-fired power plants are regulated under section 112 they can’t be regulated under section 111 at all. And 111 is our greenhouse gas provision. And coal-fired power plants are of course regulated under section 112 because they put out lots of hazardous air pollutants, including mercury. So the obvious question is what do you do with that? It’s the stuff of a bizarre law school exam. But it is not only real, the fate of the nation’s ability to address climate change under the existing Clean Air Act may well hang in the balance. GAZETTE: Can the courts pick and choose one version over another? LAZARUS: That’s the question: What are the courts supposed to do? EPA’s view is that obviously we’re right under the Senate version and we think the House version can be read in a way that’s consistent. The other side says not so fast. We think the House version is what Congress said and we think the House version can’t be read the other way and we think this is something that basically should be decided by the courts. So it’s a conundrum. I think EPA has the better argument. I think they’re entitled to deference as the expert agency, and they have some Supreme Court precedent — by analogy — on their side. But that one is really just bizarre. No way around it.

GAZETTE: So, is a plan of some sort salvageable even if EPA loses the fenceline argument?

LAZARUS: EPA was very careful to make their plans severable.

As I described, EPA’s emission-reduction targets rest on three building blocks. Building Block 1 is what the facilities themselves can do on site. Building Block 2 is using more of the natural gas and other sources on the grid. Building Block 3 is more wind and solar on the grid. So if they lose 3 and 2, they still have Building Block 1, but a lot of the reductions are currently achieved through Building Blocks 2 and 3. Of course, if confined to just Building Block 1, EPA might well go back and sharply reduce emissions relying on only that one building block. In other words, the coal industry may need to be careful about what they wish for.

#### We’re net-better for climate – SO2 is wrong

Gillett and Von Salzen 13

Nathan P Gillett and Knut Von Salzen (Canadian Centre for Climate Modelling and Analysis, Environment Canada, University of Victoria). “The role of reduced aerosol precursor emissions in driving near-term warming.” Environmental Research Letters. July 18th, 2013. http://iopscience.iop.org/article/10.1088/1748-9326/8/3/034008/pdf

4. Conclusions Consistent with previous studies we find that projected decreases in aerosol and aerosol precursor emissions under the RCP scenarios will drive gradual warming through the 21st century. In the near-term, this aerosol-induced warming is largest in RCP 2.6, which has the most rapid decrease in SO2 emissions [8, 13]. However, compared to the total warming simulated under these scenarios, the aerosol-driven warming is modest: In the RCP 2.6 scenario aerosol emission changes contribute around 30% of the global mean warming over the period up to 2040 considered by Chalmers et al [13], though the contribution is larger in some regions. Thus, while projected aerosol emissions changes are a significant contributor to future warming, and while results may be model-dependent, we consider it unlikely that a period of rapid warming between 2010 and 2025 in the HadGEM2-ES RCP 2.6 simulations is primarily ‘a result of a rapid decrease in sulfate aerosol load’, as Chalmers et al [13] concluded. In our simulations, warming over this period is mainly driven by GHG increases. Our results also disagree with those of Kloster et al [12], who find that rapid reductions in aerosol and aerosol precursor emissions could drive a warming of ∼1 K by 2030. Even by the end of the 21st century, by which time aerosol and aerosol precursor emissions are at close to preindustrial levels in the RCP scenarios, the associated warming in CanESM2 is only 0.4–0.7 K, which is also considerably less than that reported in simulations from the GFDL-CM3 model [14]. CanESM2 has a Transient Climate Response of 2.4 K, which is among the highest of the CMIP5 models [15]. Its total aerosol forcing in 2000 is −0.89 W−2 , which is consistent with other model estimates [18]. Perhaps in part due to its high Transient Climate Response, a detection and attribution analysis indicated that its response to aerosols should be scaled down in order to best match observations [20]. In addition, all the RCP scenarios include an increase in emissions of ammonia over the next few decades which is expected to lead to enhanced nitrate aerosol and a compensating cooling effect, neglected in our simulations. Based on these considerations, we suggest that our estimates of the 21st century warming due to aerosol changes may lie towards the upper end of likely values, though we emphasize that there are substantial uncertainties in the future evolution of aerosol radiative forcing and the associated climate response. Overall we conclude that while aerosol emissions changes under the RCP scenarios make a significant contribution to 21st century warming, GHGs are the dominant driver of warming both in the near-term and long-term. We do not expect aerosol reductions to drive a period of particularly rapid near-term warming, but rather to contribute a gradual warming over the 21st century.

### AT: CO2 Fert

#### Even if it causes greater yields – the crops are poisonous

O’Hare 5-31-16

Ryan, How climate change is making crops POISONOUS: Extreme weather may be increasing the level of toxins in food, http://www.dailymail.co.uk/sciencetech/article-3617047/Extreme-weather-increasing-level-toxins-food-scientists-warn.html, msm

Food crops could be generating more chemical compounds in response to extreme weather - and this could be damaging our health, scientists have warned.

A new report says that crops such as wheat and maize are generating more potential toxins as a reaction to protect themselves from extreme weather.

But these chemical compounds are harmful to people and animals if consumed for a prolonged period of time, according to the United Nations Environment Assembly meeting in Nairobi.

'Crops are responding to drought conditions and increases in temperature just like humans do when faced with a stressful situation,' explained Jacqueline McGlade, chief scientist and director of the Division of Early Warning and Assessment at UNEP.

Under normal conditions, for instance, plants convert nitrates they absorb into nutritious amino acids and proteins.

But prolonged drought slows or prevents this conversion, leading to more potentially problematic nitrate accumulating in the plant, the report said.

If people eat too much nitrate in their diets, it can interfere with the ability of red blood cells to transport oxygen in the body, the report said.

Crops susceptible to accumulating too much nitrate in times of stress include maize, wheat, barley, soybeans, millet and sorghum, it said.

Some drought-stressed crops, when then exposed to sudden large amounts of rain that lead to rapid growth, in turn accumulate hydrogen cyanide, more commonly known as prussic acid, the report said.

Prussic acid - one of the ingredients used in some types of chemical warfare - interferes with oxygen flow in humans. Even short-term exposure can be debilitating for people, McGlade said.

#### CO2 destroys crops – yield and nutrients – causes extinction

Kahn 16 [Laura H. Kahn, general internist who began her career in health care as a registered nurse, Kahn works on the research staff of Princeton University's Program on Science and Global Security, 9-12-2016 http://thebulletin.org/can-we-remain-food-secure-amid-climate-change9875]

Agriculture is the foundation of human civilization. Before domesticated plants and animals ensured a stable and secure food supply, humans lived as hunters and gatherers, moving from place to place in search of food. Life was difficult and tenuous, and evidence suggests that humans almost went extinct around 74,000 years ago because of extreme changes in climate. Settling down in fertile regions allowed towns, cities, and eventually nations to develop. The agriculture that supported this development relied on rich soil, clean water, and a predictable, relatively mild climate.

A geological timeline of the Earth’s temperature shows how remarkably stable the climate has been for the past 10,000 years, during which human civilization has flourished. The Holocene era, which we live in now, began around 12,000 years ago as the Ice Age ended. With the exception of two later periods of cooling—the Late Antique Little Ice Age from 536 to 660 AD and the Little Ice Age from roughly 1300 to 1850 AD, which led to areas of crop failure, famine, and death—humans have experienced a climate conducive to food production.

We can no longer take our stable climate for granted.

Atmospheric carbon dioxide is at a level never previously seen by humanity. Between 1900 and 2000, it surged from 290 to 369 parts per million (ppm)—an increase of approximately 27 percent, largely from burning fossil fuels. In 2013, the level passed 400 ppm for the first time in human history, and it is projected to increase to as high as 1500 ppm if fossil fuel consumption continues at present rates over the next few centuries. There is a time lag of around 30 to 40 years between when carbon dioxide is pumped into the atmosphere and when its effects are felt, because the planet’s massive oceans take longer to warm than the atmosphere. So the climate we are experiencing now is due to greenhouse gas emissions from 30 to 40 years ago. Widespread coral bleaching from ocean acidification is one sign of on-going deleterious change. Coastal flooding is another. We should anticipate climactic conditions getting worse in the future.

In the United States, it’s easy to be complacent about food security. As defined by the World Food Summit in 1996, food security is “when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” Most US-born Americans have never experienced food rationing, shortages, or sky-high food prices. Immigrants from war-torn nations or developing countries often have. According to US Department of Agriculture data, since the end of World War II, the percentage of disposable income Americans spend on food (for consumption both at home and away from home, such as at restaurants, schools, and work) decreased from 21 percent in 1946 to 9.7 percent in 2014. In 2015, US consumers used only around 6.4 percent of their total expenditures to pay for food for consumption at home. Singapore spent the next-lowest fraction at 6.7 percent, and in other developed countries, such as the United Kingdom (8.2 percent), Canada (9.1 percent), Australia (9.8 percent), Germany (10.3 percent), and France (13.2 percent), people spent more. In poor, developing countries, people spend a considerably higher fraction of their money on food for home consumption—35.2 percent in Egypt, for example, and 56.4 percent in Nigeria.

The United States has, in general, enjoyed bountiful food since its founding. Today, its entire consumer economy depends on food security, because inexpensive, safe, accessible food makes it possible for people to spend the rest of their incomes on stuff like cars, cell phones, personal computers, books, and clothing. We take food security for granted.

Local food production, access to global food markets, technology, and climate all impact food security. The United Nation’s Food and Agriculture Organization issued a 2015 Hunger Map highlighting food insecure regions, showing that despite some global progress in reducing hunger, poor countries in sub-Saharan Africa, the Middle East, Asia, and Central and South America remain food insecure. Grid Arendal, an organization affiliated with the UN Environment Programme, has proposed strategies to improve food security: food commodity price regulations, funding to boost small-scale farmer productivity, recycling of post-harvest losses and waste with new technologies, and increasing trade and market access through infrastructure improvements and trade barrier reductions. As longer-term strategies, the organization recommends raising awareness of the pressures of population growth, as well as limiting global climate change.

The question is: Can we sustainably feed ourselves without destroying the natural world as climate change worsens? In September 2015, the United Nations adopted the 2030 Agenda for Sustainable Development, with food security one of its top goals. The UN Secretary-General launched a Zero Hunger Challenge at the 2012 Conference on Sustainable Development with the aim of eliminating malnutrition and ending hunger by making all food systems sustainable, with zero food loss or waste and 100 percent accessibility year-round. These are laudable goals, but it’s not clear whether they are achievable.

In December 2015, the US Department of Agriculture issued a technical report finding that climate change will likely affect local, regional, and global food security, resulting in frequent food production disruptions and increased prices. The global food system will be adversely affected, particularly in tropical regions inhabited by poor populations.

The United States plays a key role in global food security, according to the USDA report. With 16 percent of global agricultural exports, it is the world’s largest food exporter. It has 11 percent of the world’s arable land, and with advanced technologies including genetically modified crops, is able to maximize agricultural yields. It is the world’s largest producer of corn and soybeans and one of the world’s largest producers of wheat and rice. Global food prices are affected by US agricultural production, which is affected by the weather. In 2012, a severe drought affected 80 percent of US farmland resulting in corn and soybean shortages. The shortfall lead to international corn and soybean price increases of 25 and 17 percent, respectively. In the decades ahead, the entire United States is expected to warm considerably.

The adverse impact of rising greenhouse gas emissions on agriculture could even extend beyond decreased yields to include reduced nutrient levels. A study published in Nature in 2014 found that grasses and legumes such as wheat, rice, maize, and soybeans grown in elevated carbon dioxide environments had significantly lower zinc and iron concentrations.

We need political leaders who recognize that human-caused greenhouse-gas-induced climate change poses a threat to food security, and are committed to developing and implementing policies to reduce and mitigate the effects. I’ve written about the need for a new Green Revolution to prepare for a changing climate, one that brings technology to bear on increasing food yields. But much more needs to be done. Lowering global carbon dioxide emissions would also lower the cost of adaptation, which should provide additional incentive to reduce emissions and adhere to the Paris Climate Agreement signed in December 2015.

The Department of Agriculture report determined that about one-sixth of global agricultural production (by mass) is internationally traded, which is good news for places where local or regional food production falls. Building up and strengthening food trade agreements would help support global food security and ultimately international security generally. Technology also has a role to play in supporting global food security, as supply chains that are too long run the risk of jeopardizing safety through contamination and spoilage. Innovative packaging and expanded cold storage can help prolong shelf life and reduce waste.

President Obama’s proposed budget for fiscal year 2017 allocates $138 billion of the total federal budget—about 3 percent—for food and agriculture, focusing on food security. Under the auspices of the Department of Agriculture, the Agricultural Research Service and National Institute for Food and Agriculture conduct in-house and extramural peer-reviewed research, respectively, on issues including crop and livestock production, climate change, and water resources. Their combined proposed budgets for fiscal year 2017 constitute just 1.9 percent of the USDA’s total budget, though. Support for research and development under worsening climactic and environmental conditions will need to increase given the importance of food security.

Beyond traditional agriculture in rural areas, urban populations are becoming increasingly interested in food production, as evidenced by urban, backyard, rooftop, and balcony agriculture. With the global population becoming increasingly urban, this is a good development. In Western countries, community gardens are popular, and there are proposals to develop vertical gardens in skyscrapers. In Africa, urban agriculture might help contribute to local food security.

Food security is too important an issue to wait until climate change worsens before doing something about it. We need to figure out how to sustainably feed ourselves as our environment degrades. Those who deny the reality of climate change and refuse to do anything about it threaten the future of human civilization.

#### Higher temps counteract CO2 benefits – cause sterility

**Roy 15** [“Growth and nitrogen allocation of dry season tropical rice as a result of carbon dioxide fertilization and elevated night time temperature” [K. S. Roy](http://link.springer.com/article/10.1007/s10705-015-9741-2#author-details-1) Crop Production Division*Central Rice Research Institute.* [P. Bhattacharyya](http://link.springer.com/article/10.1007/s10705-015-9741-2#author-details-2) Crop Production Division*Central Rice Research Institute.* [A. K. Nayak](http://link.springer.com/article/10.1007/s10705-015-9741-2#author-details-3) Crop Production Division*Central Rice Research Institute*. [S. G. Sharma](http://link.springer.com/article/10.1007/s10705-015-9741-2#author-details-4) Biochemistry Physiology and Environmental Science Division*Central Rice Research Institute*. [D. C. Uprety](http://link.springer.com/article/10.1007/s10705-015-9741-2#author-details-5) Division of Plant Physiology*Indian Agricultural Research Institute* http://link.springer.com/article/10.1007/s10705-015-9741-2]

The elevated CO2 stimulated biomass, LAI, NAR and grain yield of rice compared to ambient CO2. Elevated CO2 **with** high temperature **lead to** reduc**tion in** yieldadvantage **as** compared to **elevated** CO2 alone. As per higher production and yield advantage was concerned e-CO2condition was found better as compared to e-CO2 + T for dry season rice cultivation in Eastern India. The high night time temperatures also significantly reduced grain yield **even under** the **effect of CO2 fertilization.** The **2 °[degree] C increase in nighttime air temperature over ambient temperature during the dry season was above the critical temperature limit at reproductive stages of rice** which in turn induced **spikelet** sterility and there by caused yield reduction. Carbon dioxide fertilization positively influenced C and N allocations in plant components. For grain quality, the +2 °C air temperature than ambient both in daytime and nighttime did not show any detrimental effect in dry season. In the future, the response of different rice cultivars in other ecologies needs to be judged under elevated CO2 and temperature conditions in order to identify climate resilient cultivars along with suitable production technologies.

### ---Matt cards

#### Most tested and comprehensive studies are aff – on balance harms plants

Tai 16 [Stephanie Tai Associate Professor University of Wisconsin Law School. Brief submitted on behalf of ~20 climate scientists 4-1-2016 https://www.edf.org/sites/default/files/content/2016.04.01\_climate\_scientists\_amicus\_brief\_for\_epa.pdf]

II. Rising Greenhouse Gas Levels Have Led to Changes to the Earth’s Climate and Physical and Biological Systems

Scientists attempt to better understand the world through “systematic observation and experimentation, inductive and deductive reasoning, and the formation and testing of hypotheses and theories.” Hanne Andersen & Brian Hepburn Brian, Scientific Method in The Stanford Encyclopedia of Philosophy (Edward N. Zalta ed. 2015), http://plato.stanford.edu/archives/win2015/entries/scientific-method/. The principle behind relying upon multiple methods to explore scientific phenomena is to allow theoretical models to be tested and strengthened through independent research, empirical observations, and experimental replication. See Federal Judicial Center, Reference Manual on Scientific Evidence at 44 (“[S]cience is, above all, an adversarial process. It is an arena in which ideas do battle, with observations and data the tools of combat.”). Our work in the area of climate systems is no exception. Decades of research have established a link between increased emissions of greenhouse gases and key biogeochemical cycles. The Earth’s climate is a complex system, involving a number of connected physical, chemical and biological processes occurring in our air, lands, and oceans. Thus our research of this system must be conducted through a coupling of scientific models (that capture our understanding of empirical relationships between these processes) with independent empirical measurements such as satellite data, airborne observations, and on the ground measurements to establish the validity of our models. While refinements based on physical data have improved our models over time, thus providing more detail about the exact effects of rising anthropogenic greenhouse gas emissions, these models have consistently demonstrated net changes to the Earth’s climate resulting from these emissions. See, e.g., Reto Knutti & Jan Sedláček, Robustness and Uncertainties in the New CMIP5 Climate Model Projections, 3 Nature Climate Change 369, 369-73 (2013) (examining the complex models for the 2013 IPCC Fifth Assessment Report and determining that “projected global temperature change from the new models is remarkably similar to that from those used in [the Fourth IPCC Assessment Report]” and that “[t]he spatial patterns of temperature and precipitation change are also very consistent”).

Indeed, the scientific community has taken great care to present the extent to which our models have been empirically tested and validated in as transparent and accurate a manner as possible. The IPCC Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties, for example, presents these two figures: This guidance was created with the recognition that “[s]ound decisionmaking that anticipates, prepares for, and responds to climate change depends on information about the full range of possible consequences and associated probabilities. Such decisions often include a risk management perspective.” Id. at 1.

The 2014 IPCC Climate Change Synthesis Report followed this same transparent rubric to present a synthesis of the thousands of peerreviewed scientific studies considered and evaluated by the three Working Groups of the IPCC in its working history. Using this guidance and summarizing the state of climate system research such as those we conduct, the Report provided a number of observations using qualitative confidence descriptors described in the tables, including: Evidence of observed climate change impacts is strongest and most comprehensive for natural systems. In many regions, changing precipitation or melting snow and ice are altering hydrological systems, affecting water resources in terms of quantity and quality (medium confidence). Many terrestrial, freshwater and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances and species interactions in response to ongoing climate change (high confidence). Some impacts on human systems have also been attributed to climate change, with a major or minor contribution of climate change distinguishable from other influences . . . Assessment of many studies covering a wide range of regions and crops shows that negative impacts of climate change on crop yields have been more common than positive impacts (high confidence). Some impacts of ocean acidification on marine organisms have been attributed to human influence (medium confidence).

A number of our other observations are summarized in the full text of the IPCC Synthesis Report. It is very likely that 1983 to 2012 was the warmest 30-year period of the last 800 years in the Northern Hemisphere. Id. at 40. It is also “virtually certain that the upper ocean (0−700 m) warmed from 1971 to 2010.” Id. We have high confidence that the rate of sea level rising since rapid industrialization in the mid-19th century has been larger than the mean rate during the previous two thousand years. Id. Moreover, we have high confidence that glaciers have been shrinking worldwide due to climate change and medium confidence that this has been affecting downstream runoff and water resources. Id. at 51. Our research has also connected these physical changes on our planet with biological changes. For example, we have high confidence that many plant and animal species have shifted their geographic ranges, physical activity patterns, populations, and inter-species interactions in response to climate change. Id. We also have high confidence that climate change is affecting worldwide agricultural patterns, as most studies suggest more negative impacts on crop yields than positive impacts due to climate change. Id. We are still developing our understandings of the relationship between human ill-health and climate change, but currently, we have medium confidence that regional climate developments stemming from global climate changes have changed the “distribution of some water-borne illnesses and disease vectors.” Id. Finally, the report synthesizes the current state of scientific research on relationships between increased human emissions of greenhouse gases and extreme climactic events. It is very likely that our emissions have more than doubled the probability of the occurrence of heat waves in some locations. Id. at 53. Moreover, we have very high confidence that extreme heat events currently leads to increases in mortality and morbidity in North America. Id. There is a medium likelihood that emissions have led to increasing trends in extreme precipitation, causing flooding on a regional level. Id. It is likely that extreme sea level events such as storm surges result from the rising sea levels related to climate change. Id. And we have a very high confidence that “[i]mpacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability.” Id.

#### No impact – no scarcity

Poole, 6 (Holly Kavana, Institute for Food and Development Policy,“12 Myths About Hunger”, Backgrounder, 12(2), Summer, 4-9, http://www.foodfirst.org/12myths)

Myth 1: Not Enough Food to Go Around

Reality: Abundance, not scarcity, best describes the world's food supply. Enough wheat, rice and other grains are produced to provide every human being with 3,200 calories a day. That doesn't even count many other commonly eaten foods - ­vegetables, beans, nuts, root crops, fruits, grass-fed meats, and fish. Enough food is available to provide at least 4.3 pounds of food per person a day worldwide: two and half pounds of grain, beans and nuts, about a pound of fruits and vegetables, and nearly another pound of meat, milk and eggs - ­enough to make most people fat! The problem is that many people are too poor to buy readily available food. Even most "hungry countries" have enough food for all their people right now. Many are net exporters of food and other agricultural products.

#### Only true in the short-term at best – over time warming undermines productivity

NSF 12 (National Science Foundation, citing a study conducted by Northern Arizona University, “Climate Change Boosts Then Quickly Stunts Plants, Decade-long Study Shows,” 4/10, http://www.nsf.gov/news/news\_summ.jsp?cntn\_id=123798)

Global warming may initially make the grass greener, but not for long, according to new research results. The findings, published this week in the journal Nature Climate Change, show that plants may thrive in the early stages of a warming environment but then begin to deteriorate quickly. "We were really surprised by the pattern, where the initial boost in growth just went away," said scientist Zhuoting Wu of Northern Arizona University (NAU), a lead author of the study. "As ecosystems adjusted, the responses changed." Ecologists subjected four grassland ecosystems to simulated climate change during a decade-long study. Plants grew more the first year in the global warming treatment, but this effect progressively diminished over the next nine years and finally disappeared. The research shows the long-term effects of global warming on plant growth, on the plant species that make up a community, and on changes in how plants use or retain essential resources like nitrogen. "The plants and animals around us repeatedly serve up surprises," said Saran Twombly, program director in the National Science Foundation (NSF)'s Division of Environmental Biology, which funded the research. "These results show that we miss these surprises because we don't study natural communities over the right time scales. For plant communities in Arizona, it took researchers 10 years to find that responses of native plant communities to warmer temperatures were the opposite of those predicted." The team transplanted four grassland ecosystems from a higher to lower elevation to simulate a future warmer environment, and coupled the warming with the range of predicted changes in precipitation--more, the same, or less. The grasslands studied were typical of those found in northern Arizona along elevation gradients from the San Francisco Peaks down to the Great Basin Desert. The researchers found that long-term warming resulted in loss of native species and encroachment of species typical of warmer environments, ultimately pushing the plant community toward less productive species. The warmed grasslands also cycled nitrogen more rapidly. This should make more nitrogen available to plants, scientists believed, helping plants grow more. But instead much of the nitrogen was lost, converted to nitrogen gases in the atmosphere or leached out by rainfall washing through the soil. Bruce Hungate, senior author of the paper and an ecologist at NAU, said the study challenges the expectation that warming will increase nitrogen availability and cause a sustained increase in plant productivity. "Faster nitrogen turnover stimulated nitrogen losses, likely reducing the effect of warming on plant growth," Hungate said. "More generally, changes in species, changes in element cycles--these really make a difference. It's classic systems ecology: the initial responses elicit knock-on effects, which here came back to bite the plants. These ecosystem feedbacks are critical--you can't figure this out with plants grown in a greenhouse." The findings caution against extrapolating from short-term results, or from experiments with plants grown under artificial conditions, where researchers can't measure the feedbacks from changes in the plant community and from nutrient cycles. "The long-term perspective is key," said Hungate. "We were surprised, and I'm guessing there are more such surprises in store."

#### Boosts weeds and pests

Peeples 14 – citing a Harvard study, AND another new climate report, AND Lewis Ziska a plant physiologist at the U.S. Department of Agriculture, AND David Wolfe, an expert in climate change and plant physiology at Cornell University Lynne Peeples environment correspondent, formerly worked on environmental health studies. Biostatistics degree from Harvard. “Climate Change Will Strengthen Pests, Weaken Crops, Studies Say” <http://www.huffingtonpost.com/2014/05/09/climate-change-crops-agriculture-public-health_n_5289109.html>

\*\*about wheat/rice/soybeans too if the neg reads that DA

Count weeds and insect pests among the beneficiaries of climate change. Meanwhile, the crops we need will have fewer nutrients that make them beneficial, scientists revealed this week. At the root of the problem: Rising carbon dioxide levels, warming temperatures and more frequent extreme weather events do not treat all plants, insects and soil nutrients equally, according to a new federal climate report and a Harvard University study. “Weeds are **going to be** winners under any climate change scenario that we anticipate,” said Lewis Ziska, a plant physiologist at the U.S. Department of Agriculture’s crop systems and global change program, and co-author of the[National Climate Assessment](http://nca2014.globalchange.gov/) released Tuesday. Crop-devouring insects, too, are predicted to win. Ultimately, the **biggest losers** may be **us**. April was the first month in human history when carbon dioxide levels averaged greater than [400 parts per million](http://www.climatecentral.org/news/the-meteoric-rise-of-co2-in-1-video-17398) in the atmosphere. It’s an arbitrary but ominous milestone, according to experts, who forecast concentrations of the greenhouse gas will surpass 550 parts per million within the next 40 years. Both food crops and their weedy nemeses thrive on carbon dioxide. It’s the core ingredient of photosynthesis, the process by which a plant coverts energy from the sun into sugar to grow. Yet **some plants turn the gas into a competitive edge more efficiently than others.** “A lot of our worst weeds benefit the most from high carbon dioxide,” said David Wolfe, an expert in climate change and plant physiology at Cornell University in Ithaca, New York. What’s more, many weeds are incredibly adaptive to environmental changes — warmer temperatures, or extreme events such as droughts or floods — which may help them further choke out critical crops, experts noted.

#### Ends photosynthesis

Brown 8 (Lester E., Founder – Earth Policy Institute, “Plan B 3.0: Mobilizing to Save Civilization”)

Higher temperatures can reduce or even halt photosynthesis, prevent pollination, and lead to crop dehydration. Although the elevated concentrations of atmospheric C02 that raise temper­ature can also raise crop yields, the detrimental effect of higher temperatures on yields overrides the C02 fertilization effect for the major crops. In a study of local ecosystem sustainability, Mohan Wali and his colleagues at Ohio State University noted that as tempera­ture rises, photosynthetic activity in plants increases until the temperature reaches 20 degrees Celsius (68 degrees Fahrenheit). The rate of photosynthesis then plateaus until the temperature hits 35 degrees Celsius (95 degrees Fahrenheit), whereupon it begins to decline, until at 40 degrees Celsius (104 degrees Fahrenheit), photosynthesis ceases entirely '? The most vulnerable part of a plant's life cycle is the polli­nation period. Of the world's three food staples-rice, wheat, and corn-corn is particularly vulnerable. In order for corn to reproduce, pollen must fall from the tassel to the strands of silk that emerge from the end of each ear of corn. Each of these silk strands is attached to a kernel site on the cob. If the kernel is to develop, a grain of pollen must fall on the silk strand and then journey to the kernel site. When temperatures are uncommonly high, the silk strands quickly dry out and turn brown, unable to play their role in the fertilization process. The effects of temperature on rice pollination have been studied in detail in the Philippines. Scientists there report that the pollination of rice falls from 100 percent at 34 degrees Cel­sius to near zero at 40 degrees Celsius, leading to crop failure.

### AT: Adaptation

#### No tradeoff – mitigation doesn’t impede adaption – it raises awareness of the threat

#### Adaption just leads to increased oil use which is even more unsustainable and further worsens climate change, making adaption IMPOSSIBLEin the long term.

#### Mitigation is better – tipping points

Spratt 11 [David, climate policy analyst and cofounder of Carbon Equity, which advocates personal carbon allowances as the most fair and equitable means of rapidly reducing carbon emissions “4 degrees hotter: an adaptation trap?” http://www.climatecodered.org/2011/02/4-degrees-hotter-adaptation-trap.html]

In his 2010 book, “Requiem for a Species”, Clive Hamilton lays bare the trap of the “adaptation myth”: The new understanding of the climate system and the likely influences of tipping points induced by human intervention also forces us to reconsider one of the other foundations of international negotiations and national climate strategies, the belief in the ability to adapt. From the outset of the global warming debate some have argued that as much emphasis should be placed on adapting to climate change as on mitigating it. As the setting and meeting of targets appears more difficult, more people began talking about the need to adapt. Underlying the discussion is an unspoken belief that one way or another we (in rich countries) will be able to adapt in a way that broadly preserves our way of life because global warming will change things slowly, predictably and manageably. Wealthy countries can easily afford to build flood defences to shield roads and shopping centres from storm surges, and we can ‘climate proof’ homes against the effects of frequent heatwaves. Yet if our belief in our ability to stabilise the Earth’s climate is misconceived then so is our belief in our ability to adapt easily to climate change. If instead of a smooth transition to a new, albeit less pleasant, climate warming sets off a runaway process, adaptation will be a never-ending labour. The adaptation trap finds voice in those sceptics and delayers such as Roger Pielke Jr and Bjorn Lomborg, who insist that it is cheaper and more effective to adapt to global warming than to fight it. Pielke calls for “rejecting bad policy arguments when offered in the way of substitutes for adaptation, like the tired old view that today’s disaster losses are somehow a justification for changes to energy policies”. Events such as New Orleans after cyclone Katrina should disavow the notion that adaptation (rebuilding the city) is more economical that mitigation (strengthening the storm defences before the event). And it won’t take too long to figure out that building a new energy system is cheaper than constantly rebuilding lives and buildings and infrastructure and agriculture when “1-in-a-100 year” extreme heatwaves, droughts, fires, floods and cyclones become regular events on the hotter planet calendar. It is clear that our collective survival depends on the most radical mitigation effort we can imagine. Climate change is already dangerous, it is no longer a future-tense proposition. The hour is late. James Hansen, in a new paper, says that “…goals of limiting human-made warming to 2C and CO2 to 450 ppm are prescriptions for disaster.” At just 0.8C warming so far, he says we have little or no “cushion” left to avoid dangerous climate change. Restoring a safe climate means the world very quickly building a zero-emissions economy without fossil fuels, and reducing the current level of greenhouse gases. It is a vast undertaking akin to a post-war reconstruction, but we have the technologies and the economic capacity. What we presently lack is an honest conversation about where we are headed, and the political will to build the solutions that are already available to us. Our time is better spent working out how to make the impossible happen, rather than living the delusion that reasonable adaptation is possible to a 4-degree warmer world.

### AT: Food Wars

#### No food wars

Pinker, Prof @ Harvard, 11

(Steven, Steven Pinker: Resource Scarcity Doesn’t Cause Wars, <http://www.globalwarming.org/2011/11/28/steven-pinker-resource-scarcity-doesnt-cause-wars/>)

Once again it seems to me that the appropriate response is “maybe, but maybe not.” Though climate change can cause plenty of misery… it will not necessarily lead to armed conflict. The political scientists who track war and peace, such as Halvard Buhaug, Idean Salehyan, Ole Theisen, and Nils Gleditsch, are skeptical of the popular idea that people fight wars over scarce resources. Hunger and resource shortages are tragically common in sub-Saharan countries such as Malawi, Zambia, and Tanzania, but wars involving them are not. Hurricanes, floods, droughts, and tsunamis (such as the disastrous one in the Indian Ocean in 2004) do not generally lead to conflict. The American dust bowl in the 1930s, to take another example, caused plenty of deprivation but no civil war. And while temperatures have been rising steadily in Africa during the past fifteen years, civil wars and war deaths have been falling. Pressures on access to land and water can certainly cause local skirmishes, but a genuine war requires that hostile forces be organized and armed, and that depends more on the influence of bad governments, closed economies, and militant ideologies than on the sheer availability of land and water. Certainly any connection to terrorism is in the imagination of the terror warriors: terrorists tend to be underemployed lower-middle-class men, not subsistence farmers. As for genocide, the Sudanese government finds it convenient to blame violence in Darfur on desertification, distracting the world from its own role in tolerating or encouraging the ethnic cleansing. In a regression analysis on armed conflicts from 1980 to 1992, Theisen found that conflict was more likely if a country was poor, populous, politically unstable, and abundant in oil, but not if it had suffered from droughts, water shortages, or mild land degradation. (Severe land degradation did have a small effect.) Reviewing analyses that examined a large number (N) of countries rather than cherry-picking one or toe, he concluded, “Those who foresee doom, because of the relationship between resource scarcity and violent internal conflict, have very little support from the large-N literature.”

### AT: Sea Turtles

#### Doesn’t solve ocean acidification and exacerbates regional climate extremes

NRC 15 – National Research Council, Marcia K. Mcnutt (Chair), Science, Washington, DC, PhD in Earth Sciences, Scripps Institution of Oceanography, Waleed Abdalati, Ph.D, Geography, University Of Colorado, Boulder, former NASA Chief Scientist, Ken Caldeira, Carnegie Institution For Science, Stanford, California, Ph.D in Atmospheric Sciences in 1991 from the New York University Department of Applied Science, Scott C. Doney, Woods Hole Oceanographic Institution, Massachusetts, Paul G. Falkowski, Rutgers, The State University Of New Jersey, New Brunswick, Steve Fetter, University Of Maryland, College Park, James R. Fleming, Colby College, Waterville, Maine, Steven P. Hamburg, Environmental Defense Fund, Boston, Massachusetts, M. Granger Morgan, Carnegie Mellon University, Pittsburgh, Pennsylvania, Joyce E. Penner, University Of Michigan, Ann Arbor, Raymond T. Pierrehumbert, University Of Chicago, Illinois, Philip J. Rasch, Pacific Northwest National Laboratory, Richland, Washington, Lynn M. Russell, Scripps Institution Of Oceanography, La Jolla, California, John T. Snow, University Of Oklahoma, Norman, David W. Titley, Pennsylvania State University, University Park, Jennifer Wilcox, Stanford University, California (“Climate Intervention: Reflecting Sunlight to Cool Earth,” *The National Academies Press*, Committee on Geoengineering Climate: Technical Evaluation and Discussion of Impacts, Board on Atmospheric Sciences and Climate, Ocean Studies Board, Division on Earth and Life Studies, http://www.nap.edu/catalog/18988/climate-intervention-reflecting-sunlight-to-cool-earth)

The geographical and seasonal distribution of radiative forcing due to albedo modification is substantially different from that arising from a decrease of CO2. The atmosphere and ocean respond to radiative forcing by redistributing the heat in a way that alleviates the mismatch, but this requires changes in circulation patterns and also can leave regional climate anomalies uncompensated to one extent or another. Additionally, increasing albedo alters the surface energy budget by reflecting sunlight that would otherwise sustain evaporation (and hence precipitation); this can have effects on precipitation patterns. The ratio of change in precipitation to change in temperature is greater for a change in albedo than it is for a change in carbon dioxide content. Furthermore, albedo modification does not address the ocean acidification problem (Matthews et al., 2009), which, in the absence of ocean alkalinization (see Box 2.4), is an inevitable consequence of the uptake of CO2 emissions by the oceans. (For the same reason, albedo modification does retain the benefits of CO2 fertilization of land plants [Govindasamy et al., 2002].) These considerations apply to all albedo modification schemes and are discussed in detail in Chapter 3.

#### That causes extinction

Romm 12 – physicist and climate expert, Fellow of the American Association for the Advancement of Science, Senior Fellow at the Center for American Progress

(Joseph J., “Science: Ocean Acidifying so fast that it threatens humanity’s ability to feed itself”, 3/2/12; http://earthlawcenter.org/news/headline/science-ocean-acidifying-so-fast-it-threatens-humanitys-ability-to-feed-itself/)

The world’s oceans may be turning acidic faster today from human carbon emissions than they did during four major extinctions in the last 300 million years, when natural pulses of carbon sent global temperatures soaring, says a new study in Science. The study is the first of its kind to survey the geologic record for evidence of ocean acidification over this vast time period.¶ “What we’re doing today really stands out,” said lead author Bärbel Hönisch, a paleoceanographer at Columbia University’s Lamont-Doherty Earth Observatory. “We know that life during past ocean acidification events was not wiped out—new species evolved to replace those that died off. But if industrial carbon emissions continue at the current pace, we may lose organisms we care about—coral reefs, oysters, salmon.”¶ James Zachos, a paleoceanographer at University of California, Santa Cruz, with a core of sediment from some 56 million years ago, when the oceans underwent acidification that could be an analog to ocean changes today.¶ That’s the news release from a major 21-author Science paper, “The Geological Record of Ocean Acidification” (subs. req’d).¶ We knew from a 2010 Nature Geoscience study that the oceans are now acidifying 10 times faster today than 55 million years ago when a mass extinction of marine species occurred. But this study looked back over 300 million and found that “the unprecedented rapidity of CO2 release currently taking place” has put marine life at risk in a frighteningly unique way:¶ … the current rate of (mainly fossil fuel) CO2 release stands out as capable of driving a combination and magnitude of ocean geochemical changes potentially unparalleled in at least the last ~300 My of Earth history, raising the possibility that we are entering an unknown territory of marine ecosystem change.¶ That is to say, it’s not just that acidifying oceans spell marine biological meltdown “by end of century” as a 2010 Geological Society study put it. We are also warming the ocean and decreasing dissolved oxygen concentration. That is a recipe for mass extinction. A 2009 Nature Geoscience study found that ocean dead zones “devoid of fish and seafood” are poised to expand and “remain for thousands of years.“¶ And remember, we just learned from a 2012 new Nature Climate Change study that carbon dioxide is “driving fish crazy” and threatening their survival.¶ Here’s more on the new study:¶ The oceans act like a sponge to draw down excess carbon dioxide from the air; the gas reacts with seawater to form carbonic acid, which over time is neutralized by fossil carbonate shells on the seafloor. But if CO2 goes into the oceans too quickly, it can deplete the carbonate ions that corals, mollusks and some plankton need for reef and shell-building.¶ That is what is happening now. In a review of hundreds of paleoceanographic studies, a team of researchers from five countries found evidence for only one period in the last 300 million years when the oceans changed even remotely as fast as today: the Paleocene-Eocene Thermal Maximum, or PETM, some 56 million years ago. In the early 1990s, scientists extracting sediments from the seafloor off Antarctica found a layer of mud from this period wedged between thick deposits of white plankton fossils. In a span of about 5,000 years, they estimated, a mysterious surge of carbon doubled atmospheric concentrations, pushed average global temperatures up by about 6 degrees C, and dramatically changed the ecological landscape.¶ The result: carbonate plankton shells littering the seafloor dissolved, leaving the brown layer of mud. As many as half of all species of benthic foraminifers, a group of single-celled organisms that live at the ocean bottom, went extinct, suggesting that organisms higher in the food chain may have also disappeared, said study co-author Ellen Thomas, a paleoceanographer at Yale University who was on that pivotal Antarctic cruise. “It’s really unusual that you lose more than 5 to 10 percent of species over less than 20,000 years,” she said. “It’s usually on the order of a few percent over a million years.” During this time, scientists estimate, ocean pH—a measure of acidity–may have fallen as much as 0.45 units. (As pH falls, acidity rises.)¶ In the last hundred years, atmospheric CO2 has risen about 30 percent, to 393 parts per million, and ocean pH has fallen by 0.1 unit, to 8.1–an acidification rate at least 10 times faster than 56 million years ago, says Hönisch. The Intergovernmental Panel on Climate Change predicts that pH may fall another 0.3 units by the end of the century,to 7.8, raising the possibility that we may soon see ocean changes similar to those observed during the PETM.¶ More catastrophic events have shaken earth before, but perhaps not as quickly. The study finds two other times of potential ocean acidification: the extinctions triggered by massive volcanism at the end of the Permian and Triassic eras, about 252 million and 201 million years ago respectively. But the authors caution that the timing and chemical changes of these events is less certain. Because most ocean sediments older than 180 million years have been recycled back into the deep earth, scientists have fewer records to work with.¶ During the end of the Permian, about 252 million years ago, massive volcanic eruptions in present-day Russia led to a rise in atmospheric carbon, and the extinction of 96 percent of marine life. Scientists have found evidence for ocean dead zones and the survival of organisms able to withstand carbonate-poor seawater and high blood-carbon levels, but so far they have been unable to reconstruct changes in ocean pH or carbonate.¶ At the end of the Triassic, about 201 million years ago, a second burst of mass volcanism doubled atmospheric carbon. Coral reefs collapsed and many sea creatures vanished. Noting that tropical species fared the worst, some scientists question if global warming rather than ocean acidification was the main killer at this time.¶ The effects of ocean acidification today are overshadowed for now by other problems, ranging from sewage pollution and hotter summer temperatures that threaten corals with disease and bleaching. However, scientists trying to isolate the effects of acidic water in the lab have shown that lower pH levels can harm a range of marine life, from reef and shell-building organisms to the tiny snails favored by salmon. In a recent study, scientists from Stony Brook University found that the larvae of bay scallops and hard clams grow best at pre-industrial pH levels, while their shells corrode at the levels projected for 2100. Off the U.S. Pacific Northwest, the death of oyster larvae has recently been linked to the upwelling of acidic water there.¶ In parts of the ocean acidified by underwater volcanoes venting carbon dioxide, scientists have seen alarming signs of what the oceans could be like by 2100. In a 2011 study of coral reefs off Papua New Guinea, scientists writing in the journal Nature Climate Change found that when pH dropped to 7.8, reef diversity declined by as much as 40 percent. Other studies have found that clownfish larvae raised in the lab lose their ability to sniff out predators and find their way home when pH drops below 7.8.¶ “It’s not a problem that can be quickly reversed,” said Christopher Langdon, a biological oceanographer at the University of Miami who co-authored the study on Papua New Guinea reefs. “Once a species goes extinct it’s gone forever. We’re playing a very dangerous game.”

### AT: REM

#### Their argument is both economically and technologically incoherent

Lovins 17 – Amory, physicist and energy expert, former Rare-Earth Metal and magnet researcher, and one of *Foreign Policy*’s top 100 global thinkers, “Clean energy and rare earths: Why not to worry” Bulletin of Atomic Scientists, May 23, 2017, <https://thebulletin.org/2017/05/clean-energy-and-rare-earths-why-not-to-worry/> //KohlW

Rare earths’ uses are highly specialized but diverse. These elements are used in mobile phones, superstrong magnets and hence advanced motors and generators, some oil-refinery catalysts, certain lasers and fluorescent-lamp or flat-screen phosphors, some batteries and superconductors, and other technologies important to modern life. Some rare earths are particularly useful in energy applications. Around 2010, some articles and commentators warned that shortages of rare earths, or China’s near-monopoly on them, could choke off the West’s shift to renewable energy and other clean technologies. This was never true—but the myth persists. Bubble and burst. Rare earths concerned only specialists until about 2009–10. In the mid-1990s, China had consolidated its control over most of the global rare-earth market, and the last US mine and mill, once the world’s dominant producer, closed in 2002 because it was unprofitable. China began imposing export quotas in 2006, and limited exports to Japan (a major user of rare earths for high-tech miniature motors) during a diplomatic spat in 2009–10, so global prices and anxieties soared. US government agencies published urgent reports about the rare-earth crisis and its threat to national security. Could China’s control of these crucial elements—roughly 97 percent at the time—block Washington’s ability to produce Tomahawk missiles, F-35 jets, and night-vision goggles, as some military writers warned, never mind electric vehicles and wind-power turbines? As a technologist who had advised major mining companies, written two books on metal mining and a 445-page text on efficient motor systems, done rare-earth physics experiments at MIT Lincoln Laboratory, and consulted for MIT’s Francis Bitter Magnet Laboratory, I knew enough to be unconvinced by rare-earth alarm bells. It all felt like a commodity bubble, based more on a shortage of understanding—of rare earths, economic geology, and resource efficiency and substitution—than on a shortage of rare earths. Sure enough, the debate was heavy on the supply of rare earths but light and often misinformed on the demand side. The few observers who focused more on demand suspected that rare earths’ price spike wouldn’t last long, whether or not it reflected mining-stock hype. I called the coming crash, to general ridicule, in 2010. Rare-earth prices soared through spring 2011—when a rare-earth bonanza was fondly predicted for Helmand Province in Afghanistan—but then plummeted. US supplier Molycorp reopened its California rare-earth mine in 2012, but went broke in 2015 when low world prices wouldn’t support its high costs. By 2015, MIT Technology Review asked, “What Happened to the Rare-Earths Crisis?” It misleadingly called rare earths “crucial to the permanent magnets used in wind turbines and motors in hybrid or electric cars,” and concluded that worries about them had “seemingly dissipated without much fanfare” as “demand fell more than expected,” but never connected the dots by asking why demand did that. By 2016–17, the market was in the doldrums, with China planning to limit annual production to 140,000 metric tons beginning in 2020 to try to raise prices again. An investor in the rare-earth industry in 2007 would have lost 81 percent of her portfolio value after a classic decade-long boom-and-bust wild ride (see the chart at the top of this article from buyupside.com). This is not how a durably scarce and valuable commodity behaves. What happened? Just what you’d expect of a thin market influenced by ignorance but ultimately tamed by reality. When prices soared, stockpiles rose, idle mines reopened, explorers sought and found new deposits, and recycling increased (for example, cerium in glass polishing). Most important, as customers from General Electric to Toyota to Ford sought to cut costs and boost performance, the costlier materials were used more frugally and often replaced with cheaper, better solutions—all as I’d predicted in 2010. Prices fell accordingly. Efficiency and substitution. To dig a little deeper, let’s start with supermagnets. Neodymium is a rare-earth element roughly as abundant in the Earth’s crust as lead or chromium, though far less likely to concentrate in high-grade ores. In 1982, General Motors and Sumitomo discovered that compounding one-fourth neodymium by weight with three-fourths iron and boron could make the most powerful family of supermagnets then known, typically Nd2Fe14B, and that these magnets’ properties could be further improved by adding traces of other rare earths—praseodymium plus either dysprosium or costlier terbium. (See why only specialists know this stuff?) China, having lots of all these elements and preferring value-added to raw-material exports, built up a supermagnet industry whose low prices took over most of the world market and shuttered competitors. China also vigorously pursued research and development to find further uses for its rare-earth bounty. Even in 2015, China accounted for more than 80 percent of global rare-earth production but also for about 70 percent of rare-earth demand—not an unreasonable balance. Around 2010, many commentators stridently warned that China’s near-monopoly on supermagnet rare-earth elements could make the growing global shift to electric cars and wind turbines impossible—because their motors and generators, respectively, supposedly required supermagnets and hence rare earths. Some such reports persist even in 2017. But they’re nonsense. Everything that such permanent-magnet rotating machines do can also be done as well or better by two other kinds of motors that have no magnets but instead apply modern control software and power electronics made of silicon, the most abundant solid element on Earth. The first kind is the induction motor, invented by Nikola Tesla 130 years ago and used in every Tesla electric car today. The second kind, less well-known despite origins tracing back to 1842, is the switched reluctance (SR) machine, likewise made of just iron and (less) copper, but using a different geometry and operating principle. If well-designed, which many are not, SR motors are simpler than permanent-magnet motors, more rugged (so they’re widely used, ironically, in mining equipment), more easily maintained, and equally light and compact. They can switch in milliseconds between serving as a motor or as a generator, and spinning in either direction. They’re also more flexibly controllable, more heat-tolerant, and cheaper for the same torque and production volume. The only scarce resources associated with such capable SR machines are familiarity, which few motor experts have, and skill in their more-difficult design—especially at the level achieved by the UK firm SR Drives (bought first by the US firm Emerson Electric, then by Japan’s Nidec). Both kinds of magnet-free machines can do everything required not only in electric cars but also in wind turbines, functions often claimed to be impossible without tons of neodymium. That some wind turbines and manufacturers use rare-earth permanent-magnet generators does not mean others must. It’s better not to, and the word is spreading. Similarly, the red phosphors in compact fluorescent lamps traditionally used europium. But those lamps have now been largely displaced by white LEDs that use about 96 percent less europium. Moreover, new red phosphors use no rare earths, while the latest green phosphor cuts terbium use by more than 90 percent. Erbium in fiber-optic repeaters—another small-quantity, high-value use of rare earths—looks at first glance harder to substitute. But very little erbium is needed, and fiber capacity must compete with today’s bandwidth-enhancing, multiplexing, and wireless innovations. Some hybrid cars, like my 2001 Honda Insight, used nickel-metal-hydride batteries containing lanthanum, but those are now largely replaced by lighter lithium batteries, which typically use no lanthanum. (Both kinds of batteries are also recyclable, and infrastructure for recycling is emerging.) Tesla’s market-leading lithium batteries, like its motors, use no rare earths at all. Non-lithium batteries and potent potential substitutes for batteries (notably graphene ultracapacitors) are also emerging. Moreover, all electric cars need two to three times fewer batteries if we take obesity—weight and drag—out of their design, especially by replacing heavy steel with light metals or with even lighter (but stronger) carbon-fiber composites.The carbon-fiber passenger compartment in my BMW i3 is an impressive early illustration; its carbon fiber is paid for by needing fewer batteries. Newly commercialized manufacturing methods can produce such carbon-fiber structures at automotive speed and cost. Applied throughout US automaking, such ultralighting (plus better aerodynamics and tires) could save half as much oil as OPEC produces, or about one and one-half times as much as Saudi Arabia produces. The cost of achieving these savings would be below $10 per saved barrel—or about one-fifth of the world’s mid-2017 oil price. Thus the most effective substitute for rare earths, in both motors and batteries, isn’t another exotic material for making motors or batteries; it’s smarter car design that makes motors smaller and batteries fewer. Or, even better, it could be new business models—shareable services like Zipcar and GetAround, mobility-as-a-service operations like Lyft and Uber, or autonomous vehicles—that carry more people more miles in far fewer cars at astonishingly lower cost, ultimately saving on the order of $10 trillion worldwide (in net present value). Such examples illustrate the processes of resource efficiency and substitution (processes that extend far beyond rare earths). Scarcity, real or perceived, drives price, attention, R&D, and imagination. It elicits mineral exploration: At the market’s 2011 peak, some 190 companies were scouring the planet for potentially profitable rare-earth deposits. Scarcity makes end-uses more productive, durable, and closed-cycle, with recycling no longer an afterthought but a business imperative. It even drives the kind of basic research that in the United States (largely through the government agency ARPA-E) and in Japan has lately come up with even more powerful supermagnets based on iron nitride (Fe16N2) and containing no rare earths whatsoever. Sorry, China. Remember when the 1973 and 1979 oil-price shocks triggered the development of mobility alternatives that are now coming to market and threatening to smother oil demand? The 2010-era rare-earth price spike set similarly subtle but irresistible forces in motion that will make sustained high rare-earth prices unsupportable. Sloppy analysis. Together, these shifts in economic geology, resource use, and innovation are extremely powerful. This isn’t to say that no rare-earth issues remain: Price instability, for example, remains a long-term concern if greater efforts to supply the more-valuable “heavy” subfamily of rare earths co-produce too many less-valuable “light” ones. But serious concern about rare earths still lacks an informed basis in either scarcity or oligopoly. Only the echoes of less-informed prior concerns reverberate. David Abraham’s 2015 scarce-metals book The Elements of Power is well written, contains astute observations about mining complexities and market structures, and makes many sound policy suggestions. Yet Abraham’s focus on the scarcity story slights his discussion of substitution—which, if properly developed, would have largely invalidated the concerns in the previous 10 chapters. Such scarcity-centric treatments have unfortunately reinforced a morphing of rare-earth concerns, and of some soberly targeted government research, into a commercial lobbying effort meant to scare us about scarcities of strategic metals, presumably in the hope of eliciting more subsidies to mine them (which was Congress’s first reflex in 2010). Sloppy analysis is often the culprit. Even the relatively careful Abraham describes titanium as a “rare” metal (p. 221); it’s the fourth-most abundant metal in the Earth’s crust. Some writers claim that lithium, a light metal occasionally confused with rare earths by novices, is too scarce to support a big electric-car industry—a surprise to firms with vast lithium deposits in diverse countries. A writer on a normally well-informed website worries about platinum supplies for fuel cells, failing to notice that Los Alamos National Laboratory has already cut the needed amount by tenfold, and that fuel-cell cars won’t need the catalytic converters that now tie up far more platinum. Economics ultimately follows physics. When I was a young Oxford don around 1970, I visited London’s Royal School of Mines, where my simple little introduction to metal mining was being used as a freshman text. To my astonishment, a senior professor said he’d found that the London Metal Exchange price of every nonmonetary metal, smoothed over a decade or so, could be predicted within a factor of about three—despite the metals’ enormous ranges in price and crustal abundance—from three purely physical variables. These were the grade of typical ore (that is, the ore’s concentration of the desired metal), how finely that ore must be crushed to expose a face of the ore mineral in each grain so it could be concentrated, and how much energy was needed to smelt the metal out of that mineral. Those physical variables were surrogates for the required investment and energy. With an important caveat—I don’t know how his analysis (regrettably unpublished) handled crucial details of metals produced as by-products or co-products of each other, which greatly complicate market behavior—the professor’s analysis of physical properties’ power to predict metal prices was an extraordinary tribute to the long-run efficiency of metal markets. It also adds a cautionary note to any claim that a particular element is scarce. Scarcity tends ultimately to be self-correcting through price. That’s what markets do through supply and demand—they find balance at a market-clearing price. Rare earths do merit measured expert attention, as with any special ingredient in important processes and products—cobalt or gallium, indium or phosphorus. But rare earths are very unlikely to shift the world’s strategic balance or create resource crises, as many investment enthusiasts breathlessly claimed in 2010, months before losing their shirts. Just as Saudi Arabia’s rulers are discovering that they cannot control world oil markets, and Russia’s President Putin may be starting to realize that his struggling economy’s hydrocarbons don’t confer the decisive geopolitical advantage he’d hoped, Chinese policy makers have doubtless learned, perhaps better than some of their customers, that rare earths are simply another commodity—unusual, significant, but unable to transcend the realities of economics, innovation, and trade.

### ---AT: Ahmed card

#### The scenario should have already happened – South reads blue

Ahmed 18 [Nafeez Ahmed, 12-12-2018, "We Don't Mine Enough Rare Earth Metals to Replace Fossil Fuels With Renewable Energy," Vice, https://www.vice.com/en\_us/article/a3mavb/we-dont-mine-enough-rare-earth-metals-to-replace-fossil-fuels-with-renewable-energy, accessed 11-3-2019]LHSBC

A new [scientific study](https://www.metabolic.nl/publications/metal-demand-renewable-electricity-generation-netherlands/) supported by the Dutch Ministry of Infrastructure warns that the renewable energy industry could be about to face a fundamental obstacle: shortages in the supply of rare metals.∂ To meet greenhouse gas emission reduction targets under the Paris Agreement, renewable energy production has to scale up fast. This means that global production of several rare earth minerals used in solar panels and wind turbines—especially neodymium, terbium, indium, dysprosium, and praseodymium—must grow twelvefold by 2050.∂ But according to the new study by Dutch energy systems company Metabolic, the “current global supply of several critical metals is insufficient to transition to a renewable energy system.”∂ The study focuses on demand for rare metals in the Netherlands and extrapolates this to develop a picture of how global trends are likely to develop.∂ “If the rest of the world would develop renewable electricity capacity at a comparable pace with the Netherlands, a considerable shortage would arise,” the study finds. This doesn’t include other applications of rare earth metals in other electronics industries (rare earth metals are widely used in smartphones, for example). “When other applications (such as electric vehicles) are also taken into consideration, the required amount of certain metals would further increase.”∂ Demand for rare metals is pitched to rise exponentially across the world, and not just due to renewables. Demand is most evident in “consumer electronics, military applications, and other technical equipment in industrial applications. The growth of the global middle class from 1 billion to 3 billion people will only further accelerate this growth.”∂ But the study did not account for those other industries. This means the actual problem could be far more intractable. In 2017, a [study](http://dx.doi.org/10.1038/nature21359) in Nature found that a range of minerals essential for smartphones, laptops, electric cars and even copper wiring could face supply shortages in coming decades.∂ The other challenge is that rare metals mining is massively concentrated in just a few countries: particularly China, which dominates 80 percent of mining and nearly 95 percent of refining. Although Australia and Turkey are significant producers of specific metals (such as neodymium and boron respectively), Europe and the US are overwhelmingly dependent on China, which would be in a position to control global supply—a position that could be easily abused.

### ---No Shortages

#### No shortages – new tech and recycling

Kiedasch 3/7 – Jill, energy conservation author, “We've Found a New Source for Rare-Earth Elements We Need for Green Tech” Popular Mechanics, Mar 7 2019, <https://www.popularmechanics.com/science/green-tech/a26738515/new-source-rare-earth-elements/> //KohlW

Enter Paul J. Antonick and Zhichao Hu, members of the thermodynamics team at the Rutgers University School of Engineering, who contest that instead of using harsh chemicals to extract rare-earth elements, mineral and organic acids made by naturally occurring bacteria called Gluconobacter oxydans could do the job instead. The researchers used these natural acids along with a bio-acid mixture, or biolixiviant, to extract six rare-earth elements from synthetic phosphogypsum. The results, published in The Journal of Chemical Thermodynamics, showed that “the biolixiviant was more efficient at rare earth element extraction than gluconic acid and phosphoric acid but less efficient than sulfuric acid.” Phosphogypsum is a waste by-product of phosphoric acid production. A Futurity article about the study states that “Each year, the U.S. mines an estimated 250 million tons of phosphate rock to produce phosphoric acid for fertilizers.” That’s a huge supply of phosphogypsum, representing roughly 100,000 tons of rare-earth elements ready for extraction. Currently, about 126,000 tons of REEs are produced worldwide. Tapping this resource at home would catapult U.S. production closer to China levels, which now account for 90 percent of the market share. Researchers will soon test their bacteria-based extraction process on industrial phosphogypsum, which is more complex than lab-controlled samples. This is good news for large wind turbine manufacturers that rely on magnet generators made from neodymium and dysprosium, among other rare-earth elements like praseodymium (Pr) and terbium (Tb). Altogether, the use of REEs could result in the more efficient and reliable operation of renewable technologies. Given the increase in demand for rare-earth metals, the question of how to recycle products made from them is also being considered. “With so many hundreds of thousands of tons of rare earth oxide being produced and manufactured into products each year,” says RCG’s Kerri Hart, “having recycling methods in place is a valuable contribution to keeping the costs of the materials low and maximizing the use of the rare earth elements.”

# t

## new affs bad

### 1AR

#### C/I – we don’t have to disclose new affirmatives

#### 1. New affs are good – they create a strategic incentive to research through the ability to not disclose new which pushes the community towards aff innovation and exploring new areas of literature.

#### 2. Coaching skews mean pre round prep is not an actionable standard – obviously small schools can never take advantage of preround disclosure when a team has 17 coaches cutting case negs and updates before the round

#### 3. No brightline – theory shouldn’t be about best out of round practices. That inevitably devolves to "you were a few minutes late, took too long with coaches before disclosure, etc. all of which are at the expense of substance. Means you should default to reasonability – competing interpretations create a race to the bottom.

## subsidies

### 2ac – t – subsidies – wiley – long

#### Counter-interpretation – ‘subsidies’ include the external social cost of fuel consumption – inefficient taxation is subsidization – a carbon tax removes that

Bárány and Grigonytė 15

Ambrus Bárány and Dalia Grigonytė, Measuring Fossil Fuel Subsidies, Economic Analysis from European Commission’s Directorate General for Economic and Financial Affairs, Issue 40 | March 2015, https://ec.europa.eu/economy\_finance/publications/economic\_briefs/2015/pdf/eb40\_en.pdf, msm

The International Monetary Fund (IMF) distinguishes producer and consumer subsidies to energy. "Consumer subsidies arise when the prices paid by consumers, including both firms (intermediate consumption) and households (final consumption), are below supply costs, including transport and distribution costs. Producer subsidies arise when prices are above this level"(Clements et al., 2013, p.5). The benchmark price is the international market price - adjusted for transportation and distribution costs - for internationally traded products - while it equals the cost-recovery price for energy products that are not internationally traded. The IMF further distinguishes pre-tax subsidies and tax subsidies for fossil fuel consumption. Pre-tax subsidies are defined in a similar way to the IEA's approach to subsidies, i.e. the difference between the opportunity cost of supplying a consumer with fossil fuel (the international market price) and the price paid by the end user. The tax subsidy is the difference between the efficient level and the actual level of taxation for a given fossil fuel. The efficient level of taxation means first that the tax controls for the externalities associated with the use of the fossil fuel such as pollution and its effects on health, environmental costs, congestion, all of which reduce overall welfare but are not taken into account by the user of the fossil fuel. This approach has a direct consequence for assessing post-tax subsidies for coal which is the most polluting fossil fuel, hence the negative externalities associated with the use of coal are by far the largest. Second, efficient taxation implies that fossil fuels are taxed the same way as other consumer products. Intuitively, the sum of pre-tax and tax subsidies is equal to the overall subsidy to the particular fossil fuel, called the post-tax subsidy. While pre-tax subsidies have mostly been phased out in the developed world, they are still common in developing countries. Tax subsidies are prevalent in both developed countries and emerging economies. While the IMF provides the most comprehensive source of data for FFSs; some estimates are still missing from the study, as subsidies are not estimated for each country or for each fossil fuel. Petroleum subsidies are estimated most thoroughly for all 176 countries included in the analysis, using the price-gap approach, with production subsidies included for some OECD countries. Natural gas and coal subsidies are estimated for only 56 countries (with production subsidies to coal included for some OECD countries). Subsidies to electricity are estimated for 77 countries using multiple approaches and multiple data sources. Comparison of the different methodologies The IMF approach is unique in the sense that it considers the inefficient taxation of fossil fuels as subsidisation. Thus the government's failure to deal with a market failure (such as the negative externalities associated with fossil fuel consumption) is itself a form of subsidisation according to the IMF. This approach is the most logical economically, as inefficient taxation (either not taxing fossil fuels enough to control for negative externalities, or taxing energy differently than other consumer products) is just a hidden subsidisation of fossil fuels. As the IMF concept of FFS is broader than that of the IEA or the OECD, the IMF estimates tend to be higher than the estimates of the other two organisations.

#### prefer it –

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#### a – overlimiting – our interpretation is key to aff innovation and check neg generics – their one aff mechanism would lose to a perfectly prepped out 1NC or the LIHEAP pic every debate

#### no limits explosion – our interp only adds carbon-pricing affs – they still get all subsidies good offense – it’s just a different mechanism to do the same thing

#### b – precision – our interpretation is most economically logical and pertinent to the topic’s core controversy

Chepeliev and van der Mensbrugghe 18

Maksym and Dominique, Center for Global Trade Analysis, Purdue University, USA, Global Fossil-fuel Subsidies and Emission Externalities: Inclusive Approaches to Welfare Assessment, March 25, 2018, http://www.cere.se/documents/calendar/Paper\_GTAP\_MC\_Mar\_2018\_paper.pdf, msm

On the other hand, an approach of treating inefficient taxation as a hidden subsidization of fossil fuels looks the most logical from economic point of view (Barany and Grigonyte, 2015). During recent years, more and more countries are introducing carbon pricing as a baseline. Number of implemented initiatives doubled since 2011 and quadrupled since 2007, estimated to reach 42 in 2017, potentially covering between 20% and 25% of global (greenhouse gas) GHG emissions (WB, 2016). After all, high uncertainty around fossil-fuel externalities does not mean that its level is zero and it is not a reason for inaction or negligence.

#### economic logic outweighs all other education

Hirschman and Berman 14

Daniel Hirschman is assistant professor of sociology at Brown University. He received his PhD from the University of Michigan in 2016. His dissertation examined the history of macroeconomic statistics, and how economic measurements shape our understanding of "the economy." His current work examines the politics of decision-making, with a focus on the intersection of quantitative decision-making and racial discrimination. Elizabeth Popp Berman is a sociologist whose work is at the intersection of organizations, economic sociology, and the sociology of science and knowledge. Do economists make policies? On the political effects of economics, Socio-Economic Review (2014) 12, Advance Access publication April 15, 2014, msm

Above, we emphasized how economists have become obligatory passage points within policymaking agencies, or even become policymakers themselves. Clearly, economists affect policy when they are in political ‘command posts’ (Zald and Lounsbury, 2010) and in the guts of the policy process. But economics has many effects beyond the direct decisions of powerful economists. Here, we shift our analysis from economists as individuals to economics as shaping the cognitive infrastructure of policymaking. Just as the increasing status of economists helped to institutionalize the presence of economists in policymaking, the increasing prestige of economics created openings for economic tools. These allow ‘economics’ to influence policy even when policymakers are not economists and are ignoring economists’ advice. We identify here two elements of cognitive infrastructure that have policy effects, economics as a style of reasoning and economic policy devices. Economics as style of reasoning In his research on the history of statistics, Ian Hacking introduced the term ‘style of reasoning’ to capture the new and unique way of thinking made possible by the emergence of probability (Hacking, 1992). Styles of reasoning are not scientific paradigms, nor particular theories or models. Rather, styles of reasoning are collections of orienting concepts, ways of thinking about problems, causal assumptions and approaches to methodology that enable people to produce new kinds of statements and new explanations. Hacking, for example, argues that the advent of statistics made it possible to state that the population of New York on January 1, 1820 was 100 000, and to explain that the children of unusually intelligent parents were, on average, not as intelligent because of regression towards the mean (Hacking, 1992, pp. 143, 150). The economic style of reasoning includes basic concepts such as incentives, growth, efficiency and externalities. It includes economic ways of approaching problems: by using models, systematically weighing costs and benefits, analysing quantitative empirical data, considering incentives, and thinking marginally. It suggests causal policy stories (Stone, 1989) linked to economic theories: that investing in education will increase human capital and thus raise wage levels, or that increased government spending will stimulate the economy. And it makes certain methodological assumptions: about the importance of quantification and the possibility of using monetary value as a means of commensuration, for example. Indeed, the economic style of reasoning is quite similar to the ‘“core” of relatively simple ideas and techniques’ thatReay (2012, p. 45) identified as distinctive to economists’ analytical toolkit. We suggest, though, that this style of reasoning circulates, at least in a weaker version, well beyond those who call themselves economists. Like Hacking’s statistical style, the economic style of reasoning is evolving, not fixed, and so a consideration of its effects must be historically specific. In recent decades, for example, randomized control trials have been reinstated as the methodological gold standardfor development research (Banerjee and Duflo, 2012), and the ‘nudges’ of behavioural economics have provided new ways of responding to bounded rationality (Thaler and Sunstein, 2008).7While economists often explicitly bracket normative questions from positive analysis, the style nevertheless has normative policy implications: that its objects of analysis (growth, efficiency, and so on) are, a priori, worth pursuing. This style of reasoning can influence policy in several ways. The most obvious is through institutional position. As people trained in economics, whether at the undergraduate or graduate level, take jobs in think tanks, policy-focused research institutes, and government itself, their way of thinking will subtly shape policy. The professional authority of the discipline may also lead policymakers to perceive the economic style of reasoning as superior to other forms of knowledge. The expansion of economic thinking in policymaking, however, is driven less by the number of bureaucrats with economics degrees than by the spread of economic analysis into the disciplines of law and public policy, and the associated change in how their students are trained to think about policy problems (Amadae, 2003; Allison, 2006; Teles, 2008). Since the 1970s, it has become standard for law and public policy students to receive basic education in economics, and many programmes are heavily grounded in economic reasoning (Fleishman, 1990; Hersch and Viscusi, 2012). The knowledge produced by policy devices, discussed in the next section, further facilitates the spread of the economic style by providing numbers that can be subject to economic analysis, like GDP, the inflation rate, or the unemployment rate. While working economists see it as an uphill battle to convince others in government to think like economists (Reay, 2012), policy debates have nevertheless become more focused on economic issues since the 1970s (Smith, 2007). The economic style of reasoning, once established, can have a variety of political effects. For example, the late 1970s saw US policymakers become convinced that technological innovation was critical to economic growth, a belief that was derived from economic theory (Solow, 1957; Mansfield, 1972). Policies that could be argued to encourage innovation became easier to advance relative to those that claimed some other benefit, like the improvement of medicine. The new policies that resulted encouraged the growth of activities like patenting and entrepreneurship that saw science in terms of its economic value and linked it more closely with the marketplace (Berman, 2012).

#### prefer reasonability – competing interpretations causes a race to the bottom and crowds out substance – our evidence proves the aff is reasonably substantiated by the topic literature

### 2ac – t – subsidies – wiley – short [0:45]

#### Counter-interpretation – ‘subsidies’ include the external social cost of fuel consumption – inefficient taxation is subsidization – a carbon tax removes that

Bárány and Grigonytė 15

Ambrus Bárány and Dalia Grigonytė, Measuring Fossil Fuel Subsidies, Economic Analysis from European Commission’s Directorate General for Economic and Financial Affairs, Issue 40 | March 2015, https://ec.europa.eu/economy\_finance/publications/economic\_briefs/2015/pdf/eb40\_en.pdf, msm

The International Monetary Fund (IMF) distinguishes producer and consumer subsidies to energy. "Consumer subsidies arise when the prices paid by consumers, including both firms (intermediate consumption) and households (final consumption), are below supply costs, including transport and distribution costs. Producer subsidies arise when prices are above this level"(Clements et al., 2013, p.5). The benchmark price is the international market price - adjusted for transportation and distribution costs - for internationally traded products - while it equals the cost-recovery price for energy products that are not internationally traded. The IMF further distinguishes pre-tax subsidies and tax subsidies for fossil fuel consumption. Pre-tax subsidies are defined in a similar way to the IEA's approach to subsidies, i.e. the difference between the opportunity cost of supplying a consumer with fossil fuel (the international market price) and the price paid by the end user. The tax subsidy is the difference between the efficient level and the actual level of taxation for a given fossil fuel. The efficient level of taxation means first that the tax controls for the externalities associated with the use of the fossil fuel such as pollution and its effects on health, environmental costs, congestion, all of which reduce overall welfare but are not taken into account by the user of the fossil fuel. This approach has a direct consequence for assessing post-tax subsidies for coal which is the most polluting fossil fuel, hence the negative externalities associated with the use of coal are by far the largest. Second, efficient taxation implies that fossil fuels are taxed the same way as other consumer products. Intuitively, the sum of pre-tax and tax subsidies is equal to the overall subsidy to the particular fossil fuel, called the post-tax subsidy. While pre-tax subsidies have mostly been phased out in the developed world, they are still common in developing countries. Tax subsidies are prevalent in both developed countries and emerging economies. While the IMF provides the most comprehensive source of data for FFSs; some estimates are still missing from the study, as subsidies are not estimated for each country or for each fossil fuel. Petroleum subsidies are estimated most thoroughly for all 176 countries included in the analysis, using the price-gap approach, with production subsidies included for some OECD countries. Natural gas and coal subsidies are estimated for only 56 countries (with production subsidies to coal included for some OECD countries). Subsidies to electricity are estimated for 77 countries using multiple approaches and multiple data sources. Comparison of the different methodologies The IMF approach is unique in the sense that it considers the inefficient taxation of fossil fuels as subsidisation. Thus the government's failure to deal with a market failure (such as the negative externalities associated with fossil fuel consumption) is itself a form of subsidisation according to the IMF. This approach is the most logical economically, as inefficient taxation (either not taxing fossil fuels enough to control for negative externalities, or taxing energy differently than other consumer products) is just a hidden subsidisation of fossil fuels. As the IMF concept of FFS is broader than that of the IEA or the OECD, the IMF estimates tend to be higher than the estimates of the other two organisations.

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#### b – precision – our interp is cemented in the topic literature – that’s key to education

Jocelyn Timperley (undergraduate masters in environmental chemistry from the University of Edinburgh and a science journalism MA from City University London. She previously worked at BusinessGreen covering low carbon policy and the green economy), “Explainer: The challenge of defining fossil fuel subsidies,” 06/12/17, Carbon Brief, <https://www.carbonbrief.org/explainer-the-challenge-of-defining-fossil-fuel-subsidies>

But many also rallied to praise the inclusiveness of the IMF report, which some viewed as illuminating the unfair wider financial support with which fossil fuels are often privileged. Nicholas Stern, climate economist at the London School of Economics and author of the influential 2006 Stern review, said the report “shatter[ed] the myth that fossil fuels are cheap” by showing “just how huge their real costs are”.

#### That’s key to predictability which turns their limits offense and is key to clash which is best for educational debate

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Bárány and Grigonytė 15

Ambrus Bárány and Dalia Grigonytė, Measuring Fossil Fuel Subsidies, Economic Analysis from European Commission’s Directorate General for Economic and Financial Affairs, Issue 40 | March 2015, https://ec.europa.eu/economy\_finance/publications/economic\_briefs/2015/pdf/eb40\_en.pdf, msm

The International Monetary Fund (IMF) distinguishes producer and consumer subsidies to energy. "Consumer subsidies arise when the prices paid by consumers, including both firms (intermediate consumption) and households (final consumption), are below supply costs, including transport and distribution costs. Producer subsidies arise when prices are above this level"(Clements et al., 2013, p.5). The benchmark price is the international market price - adjusted for transportation and distribution costs - for internationally traded products - while it equals the cost-recovery price for energy products that are not internationally traded. The IMF further distinguishes pre-tax subsidies and tax subsidies for fossil fuel consumption. Pre-tax subsidies are defined in a similar way to the IEA's approach to subsidies, i.e. the difference between the opportunity cost of supplying a consumer with fossil fuel (the international market price) and the price paid by the end user. The tax subsidy is the difference between the efficient level and the actual level of taxation for a given fossil fuel. The efficient level of taxation means first that the tax controls for the externalities associated with the use of the fossil fuel such as pollution and its effects on health, environmental costs, congestion, all of which reduce overall welfare but are not taken into account by the user of the fossil fuel. This approach has a direct consequence for assessing post-tax subsidies for coal which is the most polluting fossil fuel, hence the negative externalities associated with the use of coal are by far the largest. Second, efficient taxation implies that fossil fuels are taxed the same way as other consumer products. Intuitively, the sum of pre-tax and tax subsidies is equal to the overall subsidy to the particular fossil fuel, called the post-tax subsidy. While pre-tax subsidies have mostly been phased out in the developed world, they are still common in developing countries. Tax subsidies are prevalent in both developed countries and emerging economies. While the IMF provides the most comprehensive source of data for FFSs; some estimates are still missing from the study, as subsidies are not estimated for each country or for each fossil fuel. Petroleum subsidies are estimated most thoroughly for all 176 countries included in the analysis, using the price-gap approach, with production subsidies included for some OECD countries. Natural gas and coal subsidies are estimated for only 56 countries (with production subsidies to coal included for some OECD countries). Subsidies to electricity are estimated for 77 countries using multiple approaches and multiple data sources. Comparison of the different methodologies The IMF approach is unique in the sense that it considers the inefficient taxation of fossil fuels as subsidisation. Thus the government's failure to deal with a market failure (such as the negative externalities associated with fossil fuel consumption) is itself a form of subsidisation according to the IMF. This approach is the most logical economically, as inefficient taxation (either not taxing fossil fuels enough to control for negative externalities, or taxing energy differently than other consumer products) is just a hidden subsidisation of fossil fuels. As the IMF concept of FFS is broader than that of the IEA or the OECD, the IMF estimates tend to be higher than the estimates of the other two organisations.

#### prefer it –

#### a – overlimiting – our interpretation is key to aff innovation and check neg generics – their one aff mechanism would lose to a perfectly prepped out 1NC every debate

#### no limits explosion – our interp only adds carbon-pricing affs – they still get all subsidies good offense

#### b – precision – our interp is cemented in the topic literature – that’s key to education

Jocelyn Timperley (undergraduate masters in environmental chemistry from the University of Edinburgh and a science journalism MA from City University London. She previously worked at BusinessGreen covering low carbon policy and the green economy), “Explainer: The challenge of defining fossil fuel subsidies,” 06/12/17, Carbon Brief, <https://www.carbonbrief.org/explainer-the-challenge-of-defining-fossil-fuel-subsidies>

But many also rallied to praise the inclusiveness of the IMF report, which some viewed as illuminating the unfair wider financial support with which fossil fuels are often privileged. Nicholas Stern, climate economist at the London School of Economics and author of the influential 2006 Stern review, said the report “shatter[ed] the myth that fossil fuels are cheap” by showing “just how huge their real costs are”.

#### That’s key to predictability which turns their limits offense and is key to clash which is best for educational debate

#### reasonability – competing interpretations causes a race to the bottom and crowds out substance

### 2ac – at: t – subsidies

#### Counter-interpretation – ‘subsidies’ include the external social cost of fuel consumption and carbon pricing is eliminating post tax subsidies – and – we meet their extra t arguments

Meyer 5-9-19

Robinson Meyer is a staff writer at The Atlantic, where he covers climate change and technology. The Hidden Subsidy of Fossil Fuels, https://www.theatlantic.com/science/archive/2019/05/how-much-does-world-subsidize-oil-coal-and-gas/589000/, msm

Why does the IMF seem to overstate subsidies 17-fold? It comes back to its definition of subsidies. The report says they come in two flavors. First, there are pre-tax subsidies, which reflect the difference between what people pay for a fuel and what it cost to produce. This is what we usually mean when we say subsidy: Exxon might only be able to break even selling a gallon of gas for $3.50, but the government might decide that the best price for gasoline is actually $2.50. If it provisions public funds to pay this discount, then we would call the resulting $1 a subsidy. But wait! Then the report adds that there is actually another kind of subsidy, which it calls a post-tax subsidy. This subsidy reflects the difference between “actual consumer fuel prices” and the full societal and environmental costs of a fuel. These costs are very large: The burning of fossil fuels releases deadly air pollution, hastens the destruction of the climate, and (sometimes) increases traffic fatalities. And since all of those things kill people, they also depress a country’s tax base. Account for both the harms and the smaller tax base, says the IMF, and you produce an overwhelming number. In 2017, post-tax subsidies came to $4.9 trillion, or 94 percent of the total. Those costs are very real. And they represent a subsidy of sorts: They are a grant of something valuable (our lungs, our home planet, our lives) to assist an enterprise deemed advantageous (the burning of fossil fuels). But they’re not entirely a grant of money to the oil companies. They’re sort of like a grant of something valuable exchanged among ourselves: If the air pollution from my gas stove causes you to have a fatal heart attack, then I reaped most of the excess benefits of that arrangement (I didn’t have to go chop wood to cook dinner), my gas company earned a smaller share (collected via my monthly bill), and you paid for the difference. Every year, 70,000 to 107,000 Americans subsidize air pollution with their life. Of course, before you were stricken, you were on the “winning” side of that deal many times—the exact number dependent on how often you burned fossil fuels during your life. Which sharpens the point: The burning of fossil fuels demands the grant of something valuable not from one equal to another, but from the poor to the rich, from the weak to the powerful. The wealthy can and do burn more fuels, after all. A remarkable study published this year in Proceedings of the National Academy of Sciences found that black and Hispanic Americans experience about 55 percent more air pollution than they cause. White Americans, meanwhile, suffer 17 percent less air pollution than they cause. No wonder black children are four times as likely to die from asthma as white children. Does that represent a subsidy? The IMF report hopes to treat it like one. So it assigns a dollar amount to every harm inflicted by fossil fuels. The cost of air pollution varies by country—poorer countries are more willing than rich countries to accept dirty air—but it comes out to $2.3 trillion worldwide. Then the report reviews three different ways of calculating the future cost of climate change, before deciding (somewhat arbitrarily) that each additional ton of carbon in the atmosphere imposes $40 of global costs. That comes to $1.1 trillion in costs overall. Another $735 billion comes from the estimated costs of traffic, of road upkeep, and of car fatalities. These are the post-tax subsidies that dominate the IMF’s math. Note that they can’t be fixed by the removal of anything. They can be remedied only by the imposition of new policies, such as a carbon tax, an air-pollution tax, or a congestion tax. That is what the IMF means when it says that setting “fully efficient” prices could cut greenhouse-gas emissions by 28 percent. Meanwhile, the pre-tax subsidies—the ones we can remove—are much smaller. They have “declined substantially” over the past decade, the IMF says, and in many cases, they are getting removed. In 2017, they stood at $296 billion, almost half of their 2012 levels of $572 billion. What’s more, nearly all of these subsidies (96 percent of them) help people buy fossil fuels, not companies extract them. As I wrote last year, this makes the situation even harder to predict. It’s not easy to say what will happen when those subsidies, especially in countries like the United States, go away.

#### prefer it –

#### a – they over-limit – our interpretation is key to aff innovation and check neg generics – they confine the topic to a singular aff

#### no limits explosion – our interp only adds carbon-pricing affs

#### b – equitable ground – there’s no solvency for their one aff under their topic – and – it would lose to the LIHEAP pic every debate

#### no ground loss – they still get all subsidies good offense

#### c – precision –

#### It’s precedented in the literature – the IMF uses this interpretation

Bárány and Grigonytė 15

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#### prefer reasonability – competing interpretations causes a race to the bottom and crowds out substance – our evidence proves the aff is reasonably substantiated by the topic literature – and – it’s the end of a short topic – voting neg does nothing

### 2ac – at: t – subsidies (with extra t)

#### Counter-interpretation – ‘subsidies’ include the external social cost of fuel consumption and carbon pricing is eliminating post tax subsidies – and – we meet their extra t arguments

Meyer 5-9-19

Robinson Meyer is a staff writer at The Atlantic, where he covers climate change and technology. The Hidden Subsidy of Fossil Fuels, https://www.theatlantic.com/science/archive/2019/05/how-much-does-world-subsidize-oil-coal-and-gas/589000/, msm

Why does the IMF seem to overstate subsidies 17-fold? It comes back to its definition of subsidies. The report says they come in two flavors. First, there are pre-tax subsidies, which reflect the difference between what people pay for a fuel and what it cost to produce. This is what we usually mean when we say subsidy: Exxon might only be able to break even selling a gallon of gas for $3.50, but the government might decide that the best price for gasoline is actually $2.50. If it provisions public funds to pay this discount, then we would call the resulting $1 a subsidy. But wait! Then the report adds that there is actually another kind of subsidy, which it calls a post-tax subsidy. This subsidy reflects the difference between “actual consumer fuel prices” and the full societal and environmental costs of a fuel. These costs are very large: The burning of fossil fuels releases deadly air pollution, hastens the destruction of the climate, and (sometimes) increases traffic fatalities. And since all of those things kill people, they also depress a country’s tax base. Account for both the harms and the smaller tax base, says the IMF, and you produce an overwhelming number. In 2017, post-tax subsidies came to $4.9 trillion, or 94 percent of the total. Those costs are very real. And they represent a subsidy of sorts: They are a grant of something valuable (our lungs, our home planet, our lives) to assist an enterprise deemed advantageous (the burning of fossil fuels). But they’re not entirely a grant of money to the oil companies. They’re sort of like a grant of something valuable exchanged among ourselves: If the air pollution from my gas stove causes you to have a fatal heart attack, then I reaped most of the excess benefits of that arrangement (I didn’t have to go chop wood to cook dinner), my gas company earned a smaller share (collected via my monthly bill), and you paid for the difference. Every year, 70,000 to 107,000 Americans subsidize air pollution with their life. Of course, before you were stricken, you were on the “winning” side of that deal many times—the exact number dependent on how often you burned fossil fuels during your life. Which sharpens the point: The burning of fossil fuels demands the grant of something valuable not from one equal to another, but from the poor to the rich, from the weak to the powerful. The wealthy can and do burn more fuels, after all. A remarkable study published this year in Proceedings of the National Academy of Sciences found that black and Hispanic Americans experience about 55 percent more air pollution than they cause. White Americans, meanwhile, suffer 17 percent less air pollution than they cause. No wonder black children are four times as likely to die from asthma as white children. Does that represent a subsidy? The IMF report hopes to treat it like one. So it assigns a dollar amount to every harm inflicted by fossil fuels. The cost of air pollution varies by country—poorer countries are more willing than rich countries to accept dirty air—but it comes out to $2.3 trillion worldwide. Then the report reviews three different ways of calculating the future cost of climate change, before deciding (somewhat arbitrarily) that each additional ton of carbon in the atmosphere imposes $40 of global costs. That comes to $1.1 trillion in costs overall. Another $735 billion comes from the estimated costs of traffic, of road upkeep, and of car fatalities. These are the post-tax subsidies that dominate the IMF’s math. Note that they can’t be fixed by the removal of anything. They can be remedied only by the imposition of new policies, such as a carbon tax, an air-pollution tax, or a congestion tax. That is what the IMF means when it says that setting “fully efficient” prices could cut greenhouse-gas emissions by 28 percent. Meanwhile, the pre-tax subsidies—the ones we can remove—are much smaller. They have “declined substantially” over the past decade, the IMF says, and in many cases, they are getting removed. In 2017, they stood at $296 billion, almost half of their 2012 levels of $572 billion. What’s more, nearly all of these subsidies (96 percent of them) help people buy fossil fuels, not companies extract them. As I wrote last year, this makes the situation even harder to predict. It’s not easy to say what will happen when those subsidies, especially in countries like the United States, go away.

#### prefer it –

#### a – they over-limit – our interpretation is key to aff innovation and check neg generics – they confine the topic to a singular aff

#### no limits explosion – our interp only adds carbon-pricing affs

#### b – equitable ground – there’s no solvency for their one aff under their topic – and – it would lose to the LIHEAP pic every debate

#### no ground loss – they still get all subsidies good offense

#### the extra t stuff – no limits explosion here – we literally only allow one additional aff – and – it’s functionally the same as removal – it gets rid of environmental externalitis – we meet their card because we are an a “new policy” that remedies and thus eliminates post tax subsidies

#### c – precision –

#### It’s precedented in the literature – the IMF uses this interpretation

Bárány and Grigonytė 15

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#### prefer reasonability – competing interpretations causes a race to the bottom and crowds out substance – our evidence proves the aff is reasonably substantiated by the topic literature

### 2ac – at – timperley

#### don’t let them go for this interp – the timperley card explicitly doesn’t make a conclusive statement on whether or not the aff is included in the topic – that’s not a good model for topicality – we’ve inserted a rehighlighting – this actually gives us new offense – our interp is key to enable discussion of financial disparities for various energy sources – and it’s widely supported by the literature

Jocelyn Timperley (undergraduate masters in environmental chemistry from the University of Edinburgh and a science journalism MA from City University London. She previously worked at BusinessGreen covering low carbon policy and the green economy), “Explainer: The challenge of defining fossil fuel subsidies,” 06/12/17, Carbon Brief, <https://www.carbonbrief.org/explainer-the-challenge-of-defining-fossil-fuel-subsidies>

Can externalities be subsidies? The IMF report prompted much debate on whether externalities can really be labelled as subsidies. “[T]here is something rather Orwellian about describing a failure to tax something as a subsidy,” wrote Sam Bowman in the Daily Telegraph. “Rebranding externalities as subsidies might make for good headlines in the left-wing press, but it also makes for stifled debate and woolly thinking.” Brad Plumer in Vox, meanwhile, pointed out that even if you accept the premise of allowing externalities to be subsidies, the IMF included some that are pretty tenuous to say are caused by fossil fuel use, such as traffic fatalities and congestion. Still, it’s worth pointing out that the lion’s share of the cost of externalities in the IMF report were from global warming and air pollution. Others rejected the IMF’s inclusion of consumption subsidies, such as lower-than-typical VAT rates (as occurs in the UK, where the VAT rate on gas and electricity is just 5% compared to the standard 20%). “They’ve simply assumed that everything consumed in the economy should be paying much the same tax rate in order to raise revenue to pay for government,” wrote Tim Worstall in Forbes. “This just isn’t what we would normally describe as a subsidy although we can, if we want to, stretch the meaning to include it. However, do note that this means that renewables are gaining very much the same subsidies.”

[their card ends]

(It’s worth noting that some experts, including Blyth, do consider reduced VAT rates a consumer subsidy. “The UK is almost unique in the OECD countries in having such a low VAT rate,” he tells Carbon Brief. “Normal economic theory would say that you should as far as possible keep the same VAT rates across all products. So that means, in my view, that it is subsidies.”) But many also rallied to praise the inclusiveness of the IMF report, which some viewed as illuminating the unfair wider financial support with which fossil fuels are often privileged. Nicholas Stern, climate economist at the London School of Economics and author of the influential 2006 Stern review, said the report “shatter[ed] the myth that fossil fuels are cheap” by showing “just how huge their real costs are”. According to Blyth, one of the most interesting things about the IMF calculation was to see how much the scale of the externalities – whether or not they are acknowledged as subsidies – tended to dominate that of subsidies under their normal definition. For instance, the figures for air pollution and global warming externalities alone added up to over $4tn, compared to just $333bn for the more conventional forms subsidies (“pre-tax subsidies”). Blyth says: “I think it puts it into a wider context: ultimately, the community of analysts and so on who are trying to push against subsidies are, ultimately, doing it for environmental reasons, so I think it puts the whole thing on a common sort of footing.”

### 2ac – at: t – subsidies – long

**counter-interpretation – ‘subsidies’ include the external social cost of fuel consumption – that means the aff is topical**

**Meyer 5-9-19**

Robinson Meyer is a staff writer at The Atlantic, where he covers climate change and technology. The Hidden Subsidy of Fossil Fuels, https://www.theatlantic.com/science/archive/2019/05/how-much-does-world-subsidize-oil-coal-and-gas/589000/, msm

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**carbon tax is topical – our interpretation is most precise**

**Coady et al 15**

David Coady is Division Chief of the Expenditure Policy Division at the Fiscal Affairs Department of the IMF. Prior to joining the IMF, he was Research Fellow at the International Food Policy Research Institute and held academic positions at the University of London. How Large Are Global Energy Subsidies?, IMF Working Paper, https://www.imf.org/external/pubs/ft/wp/2015/wp15105.pdf, msm

A key factor in estimating the magnitude of current subsidies is which definition of “subsidies” is used. Pre-tax consumer subsidies arise when the price paid by consumers (that is, firms and households) is below the cost of supplying energy. Post-tax consumer subsidies arise when the price paid by consumers is below the supply cost of energy plus an appropriate “Pigouvian” (or “corrective”) tax that reflects the environmental damage associated with energy consumption and an additional consumption tax that should be applied to all consumption goods for raising revenues. Post-tax consumer subsidies are typically much higher than pre-tax consumer subsidies, primarily due to the large environmental cost of energy consumption (IEA 2014; Clements and others 2013; Clements and others 2014; Parry and others 2014). Some studies also include producer subsidies, which reflect the net subsidy given to energy producers (for example, through access to subsidized inputs, preferential tax treatment, or direct budget transfers) although these are typically much smaller than consumer subsidies (OECD 2013).

**prefer it –**

**a – they over-limit – our interpretation is key to aff innovation and check neg generics – they confine the topic to a singular aff**

**no limits explosion – our interp only adds carbon-pricing affs**

**b – equitable ground –**

**no solvency for the one aff under their topic**

**Diep 18**

Francie Diep is a staff writer at Pacific Standard, where she specializes in health and drug policy and the intersections of culture and science. Previously, she covered science, health, and science policy for Scientific American, Popular Science, and Smithsonian. HOW MUCH WOULD CUTTING FOSSIL-FUEL SUBSIDIES REALLY LIMIT GLOBAL WARMING?, 2-7-2018, https://psmag.com/environment/cutting-fossil-fuel-subsidies-is-not-a-silver-bullet, msm

Finally, fossil-fuel subsidies in developed regions—including North America, Europe, Japan, and Australia—are also small, compared to what governments offer in, say, Saudi Arabia and Russia. So Jewell and her team found that these countries wouldn't reduce their emissions much by simply eliminating subsidies. To meet the international pledges they've made to cut their greenhouse gases, those countries will have to implement other policies too. To make their calculations, Jewell and a team of climate and economic researchers from Europe and the United States ran five mathematical models, each estimating what would happen if the world stopped supporting fossil fuel production and consumption in 2030. The models generally agreed that the overall effect would be small, reducing demand for fossil fuels by 7 percent, assuming oil prices are high, and by just 1 to 4 percent if oil prices are low.

**and – aff would lose to the LIHEAP pic every debate**

**no ground loss – they still get all subsidies good offense**

**c – precision –**

**prefer definitions particular to ‘fossil fuel subsidies’ – their interpretation doesn’t assume the high external costs of fossil fuels**

**Davis 13**

Lucas Davis is the Jeffrey A. Jacobs Distinguished Professor at Berkeley Haas and Faculty Director of the Energy Institute at Haas. The Economic Cost of Global Fuel Subsidies, National Bureau of Economic Research Working Paper No. 19736, msm

Fuel subsidies are different from subsidies in most other markets because of the substantial *external* costs. Parry et al. (2007) goes through the complete list, finding that marginal external damages are $1.11 per gallon. Carbon dioxide emissions are an important component, but this also includes emissions of local pollutants, traffic congestion, and accidents. The $1.11 per gallon also reflects that many externalities scale by miles traveled, rather than by gallons consumed, and so marginal external damages depend on the fraction of the demand elasticity that comes from reduced mileage. Eliminating subsidies for gasoline and diesel would, with a -0.6 demand elasticity, decrease global fuel consumption by 29 billion gallons per year. At $1.11 per gallon this excess consumption imposes external costs worth $32 billion annually. Combined with the estimated deadweight loss ($44 billion), the total economic cost of fuel subsidies is $76 billion annually. The global market for gasoline and diesel was $1.7 trillion in 2012, so this is 4% of the market. This is the economic cost of pricing fuels below *private* cost. An alternative calculation would be to measure the deadweight loss relative to the full social cost of fuels consumption. This would include the deadweight loss ($44 billion) and external cost ($32 billion) from pricing below private cost, but also the additional welfare loss from units transacted for which willingness-to-pay is above private cost but below social cost. Deadweight loss under this counterfactual is $92 billion. Much of the increased deadweight loss in this alternative calculation comes from the United States, where gasoline and diesel prices are above private cost but below social cost. When ranked by country, the United States appears in spot number four, behind only Saudi Arabia, Venezuela, and Iran. 4 Conclusion Previous studies have calculated the dollar value of global fuel subsidies (IEA (2012); IMF (2013)), but this paper goes one step further and calculates the economic cost. While undoubtedly these calculations could be refined substantially, the analysis makes it clear that fuel subsidies are not just benign transfers from sellers to buyers. Under reasonable assumptions about supply and demand elasticities, the economic cost of overconsumption is very large.

**it’s precedented in the literature – the IMF uses this interpretation**

**Bárány and Grigonytė 15**

Ambrus Bárány and Dalia Grigonytė, Measuring Fossil Fuel Subsidies, Economic Analysis from European Commission’s Directorate General for Economic and Financial Affairs, Issue 40 | March 2015, https://ec.europa.eu/economy\_finance/publications/economic\_briefs/2015/pdf/eb40\_en.pdf, msm

The International Monetary Fund (IMF) distinguishes producer and consumer subsidies to energy. "Consumer subsidies arise when the prices paid by consumers, including both firms (intermediate consumption) and households (final consumption), are below supply costs, including transport and distribution costs. Producer subsidies arise when prices are above this level"(Clements et al., 2013, p.5). The benchmark price is the international market price - adjusted for transportation and distribution costs - for internationally traded products - while it equals the cost-recovery price for energy products that are not internationally traded. The IMF further distinguishes pre-tax subsidies and tax subsidies for fossil fuel consumption. Pre-tax subsidies are defined in a similar way to the IEA's approach to subsidies, i.e. the difference between the opportunity cost of supplying a consumer with fossil fuel (the international market price) and the price paid by the end user. The tax subsidy is the difference between the efficient level and the actual level of taxation for a given fossil fuel. The efficient level of taxation means first that the tax controls for the externalities associated with the use of the fossil fuel such as pollution and its effects on health, environmental costs, congestion, all of which reduce overall welfare but are not taken into account by the user of the fossil fuel. This approach has a direct consequence for assessing post-tax subsidies for coal which is the most polluting fossil fuel, hence the negative externalities associated with the use of coal are by far the largest. Second, efficient taxation implies that fossil fuels are taxed the same way as other consumer products. Intuitively, the sum of pre-tax and tax subsidies is equal to the overall subsidy to the particular fossil fuel, called the post-tax subsidy. While pre-tax subsidies have mostly been phased out in the developed world, they are still common in developing countries. Tax subsidies are prevalent in both developed countries and emerging economies. While the IMF provides the most comprehensive source of data for FFSs; some estimates are still missing from the study, as subsidies are not estimated for each country or for each fossil fuel. Petroleum subsidies are estimated most thoroughly for all 176 countries included in the analysis, using the price-gap approach, with production subsidies included for some OECD countries. Natural gas and coal subsidies are estimated for only 56 countries (with production subsidies to coal included for some OECD countries). Subsidies to electricity are estimated for 77 countries using multiple approaches and multiple data sources. Comparison of the different methodologies The IMF approach is unique in the sense that it considers the inefficient taxation of fossil fuels as subsidisation. Thus the government's failure to deal with a market failure (such as the negative externalities associated with fossil fuel consumption) is itself a form of subsidisation according to the IMF. This approach is the most logical economically, as inefficient taxation (either not taxing fossil fuels enough to control for negative externalities, or taxing energy differently than other consumer products) is just a hidden subsidisation of fossil fuels. As the IMF concept of FFS is broader than that of the IEA or the OECD, the IMF estimates tend to be higher than the estimates of the other two organisations.

**our interpretation is most economically logical and pertinent to the topic’s core controversy**

**Chepeliev and van der Mensbrugghe 18**

Maksym and Dominique, Center for Global Trade Analysis, Purdue University, USA, Global Fossil-fuel Subsidies and Emission Externalities: Inclusive Approaches to Welfare Assessment, March 25, 2018, http://www.cere.se/documents/calendar/Paper\_GTAP\_MC\_Mar\_2018\_paper.pdf, msm

On the other hand, an approach of treating inefficient taxation as a hidden subsidization of fossil fuels looks the most logical from economic point of view (Barany and Grigonyte, 2015). During recent years, more and more countries are introducing carbon pricing as a baseline. Number of implemented initiatives doubled since 2011 and quadrupled since 2007, estimated to reach 42 in 2017, potentially covering between 20% and 25% of global (greenhouse gas) GHG emissions (WB, 2016). After all, high uncertainty around fossil-fuel externalities does not mean that its level is zero and it is not a reason for inaction or negligence.

**economic logic outweighs – it’s the most valuable form of cognitive reasoning and the only intellectual infrastructure with policy-relevance**

**Hirschman and Berman 14**

Daniel Hirschman is assistant professor of sociology at Brown University. He received his PhD from the University of Michigan in 2016. His dissertation examined the history of macroeconomic statistics, and how economic measurements shape our understanding of "the economy." His current work examines the politics of decision-making, with a focus on the intersection of quantitative decision-making and racial discrimination. Elizabeth Popp Berman is a sociologist whose work is at the intersection of organizations, economic sociology, and the sociology of science and knowledge. Do economists make policies? On the political effects of economics, Socio-Economic Review (2014) 12, Advance Access publication April 15, 2014, msm

Above, we emphasized how economists have become obligatory passage points within policymaking agencies, or even become policymakers themselves. Clearly, economists affect policy when they are in political ‘command posts’ (Zald and Lounsbury, 2010) and in the guts of the policy process. But economics has many effects beyond the direct decisions of powerful economists. Here, we shift our analysis from economists as individuals to economics as shaping the cognitive infrastructure of policymaking. Just as the increasing status of economists helped to institutionalize the presence of economists in policymaking, the increasing prestige of economics created openings for economic tools. These allow ‘economics’ to influence policy even when policymakers are not economists and are ignoring economists’ advice. We identify here two elements of cognitive infrastructure that have policy effects, economics as a style of reasoning and economic policy devices. Economics as style of reasoning In his research on the history of statistics, Ian Hacking introduced the term ‘style of reasoning’ to capture the new and unique way of thinking made possible by the emergence of probability (Hacking, 1992). Styles of reasoning are not scientific paradigms, nor particular theories or models. Rather, styles of reasoning are collections of orienting concepts, ways of thinking about problems, causal assumptions and approaches to methodology that enable people to produce new kinds of statements and new explanations. Hacking, for example, argues that the advent of statistics made it possible to state that the population of New York on January 1, 1820 was 100 000, and to explain that the children of unusually intelligent parents were, on average, not as intelligent because of regression towards the mean (Hacking, 1992, pp. 143, 150). The economic style of reasoning includes basic concepts such as incentives, growth, efficiency and externalities. It includes economic ways of approaching problems: by using models, systematically weighing costs and benefits, analysing quantitative empirical data, considering incentives, and thinking marginally. It suggests causal policy stories (Stone, 1989) linked to economic theories: that investing in education will increase human capital and thus raise wage levels, or that increased government spending will stimulate the economy. And it makes certain methodological assumptions: about the importance of quantification and the possibility of using monetary value as a means of commensuration, for example. Indeed, the economic style of reasoning is quite similar to the ‘“core” of relatively simple ideas and techniques’ thatReay (2012, p. 45) identified as distinctive to economists’ analytical toolkit. We suggest, though, that this style of reasoning circulates, at least in a weaker version, well beyond those who call themselves economists. Like Hacking’s statistical style, the economic style of reasoning is evolving, not fixed, and so a consideration of its effects must be historically specific. In recent decades, for example, randomized control trials have been reinstated as the methodological gold standardfor development research (Banerjee and Duflo, 2012), and the ‘nudges’ of behavioural economics have provided new ways of responding to bounded rationality (Thaler and Sunstein, 2008).7While economists often explicitly bracket normative questions from positive analysis, the style nevertheless has normative policy implications: that its objects of analysis (growth, efficiency, and so on) are, a priori, worth pursuing. This style of reasoning can influence policy in several ways. The most obvious is through institutional position. As people trained in economics, whether at the undergraduate or graduate level, take jobs in think tanks, policy-focused research institutes, and government itself, their way of thinking will subtly shape policy. The professional authority of the discipline may also lead policymakers to perceive the economic style of reasoning as superior to other forms of knowledge. The expansion of economic thinking in policymaking, however, is driven less by the number of bureaucrats with economics degrees than by the spread of economic analysis into the disciplines of law and public policy, and the associated change in how their students are trained to think about policy problems (Amadae, 2003; Allison, 2006; Teles, 2008). Since the 1970s, it has become standard for law and public policy students to receive basic education in economics, and many programmes are heavily grounded in economic reasoning (Fleishman, 1990; Hersch and Viscusi, 2012). The knowledge produced by policy devices, discussed in the next section, further facilitates the spread of the economic style by providing numbers that can be subject to economic analysis, like GDP, the inflation rate, or the unemployment rate. While working economists see it as an uphill battle to convince others in government to think like economists (Reay, 2012), policy debates have nevertheless become more focused on economic issues since the 1970s (Smith, 2007). The economic style of reasoning, once established, can have a variety of political effects. For example, the late 1970s saw US policymakers become convinced that technological innovation was critical to economic growth, a belief that was derived from economic theory (Solow, 1957; Mansfield, 1972). Policies that could be argued to encourage innovation became easier to advance relative to those that claimed some other benefit, like the improvement of medicine. The new policies that resulted encouraged the growth of activities like patenting and entrepreneurship that saw science in terms of its economic value and linked it more closely with the marketplace (Berman, 2012).

**prefer reasonability – competing interpretations causes a race to the bottom and crowds out substance – our evidence proves the aff is reasonably substantiated by the topic literature**

### 2ar – at: t – subsidies

**intuitiveness isn’t a reason to vote negative – they have insufficient evidence to support their interpretation and ours is vastly superior – please read our evidence at the end of this debate – our interpretation is that ‘subsidies’ for fossil fuels include both ‘pre-’ and ‘post-tax’ subsidies – ‘pre-tax subsidies’ reflect the difference between what people pay for a fuel and what it costs to produce, while a ‘post-tax subsidy’ reflects the difference between the dollar price paid for the fuel and its full environmental cost – the social and environmental implications of pollution and climate change are quantifiable costs that constitute the external cost of fossil fuel consumption – a carbon tax is topical under this interpretation because it remedies the market inefficiency between consumer prices and the full social cost of the fuel – that’s both Meyer and Coady**

**precision turns and outweighs their offense – there are 3 internal links –**

**a – our definition is the most prevalent in the literature – the imf uses this definition to perform global analyses of the status of fossil fuel subsidization because there’s a relevant distinction between pre- and post-tax subsidies geographically, financially, and economically – that’s Bárány and Grigonytė**

**b – only our definition is formulated on the basis of economic logic – the market inefficiency generated from the mismatch between consumer prices and the environmental cost of fuel production constitutes a hidden subsidization because the price of fuels is artificially capped below its efficient price – that’s Chepeliev and van der Mensbrugghe**

**c – particularity to ‘fossil fuels’ and intent to define – their generic definition of ‘subsidy’ is inappropriate to the topic because it doesn’t assume the high external costs of fossil fuels which distinguish it from other markets – that’s Davis – only our evidence has intent to define, theirs defines in passing**

**predictability is the gold standard for how research is conducted – means even if they access a hypothetically better vision of the topic, it’s not offense for them because it’s never actualized – prioritizing any other standard devolves debate into a flux of arbitrary definitions that don’t reflect the substantive topic literature – that internal link turns their offense – even if their limits are better, no one predicts them so they can never access better topic education**

**precision is key to topic expertism – that’s the only impact – breadth is inevitable because of multiple debates but depth of topic is necessary to make us experts in the literature which is crucial to actualizing our education because it’s the only way people in the real world will listen to us – topics guided by the particularity of the topic’s literature are best for teaching in-depth and technical research skills**

**independently – economic logic is a conceded standard that outweighs – prefer interpretations that foster research into economic reasoning like externalities – that’s necessary to create valuable cognitive infrastructure in students that teaches us how to influence policymaking EVEN if we don’t become policymakers – that’s Hirschman and Berman**

**now defense –**

**a – limits – we don’t explode them – we add literally TWO affs to the topic – carbon tax and cap-n-trade – other strategies to reduce emissions wouldn’t be topical under our interpretation because they don’t increase the private sector of cost of producing fossil fuels and therefore don’t rectify the market inefficiency of the gap between social cost and private cost**

**this is additional offense for us – the one aff under their topic would lose every single debate**

**1 – the emissions reductions benefits of the elimination of ‘pre-tax subsidies’ are so small that it would reduce demand for fossil fuels by a negligible amount – that’s diep**

**2 – the aff would always lose to the LIHEAP pic**

**b – ground – we don’t rob them of it – they still get all their ‘subsidies good’, ‘fossil fuels good’, ‘renewables bad’, and oil prices offense**

# k

## top level

### 2ac – framework

#### we should get to weigh the aff against the status quo or a competitive alternative – that’s key to competitive equity and policy literacy –

#### a – infinite assumptions in the 1ac – forcing us to have a defense of all of them structurally favors the neg, subverts aff prep, and sidelines the 1ac

#### b – detail-focused policy analysis is best – fosters expertism, deconstructs biases, and teaches us how to engage institutions – that’s the only skill that accesses real-world change

### 2ac – defense of economics

#### modern economics is empirically robust and useful for policymaking – their ev is out-dated

Chetty 10/20/13

Raj Chetty is a professor of economics at Harvard, NY Times, October 20, 2013, "Yes, Economics Is a Science", http://www.nytimes.com/2013/10/21/opinion/yes-economics-is-a-science.html?\_r=0&pagewanted=all

But the headline-grabbing differences between the findings of these Nobel laureates are less significant than the profound agreement in their scientific approach to economic questions, which is characterized by formulating and testing precise hypotheses. I’m troubled by the sense among skeptics that disagreements about the answers to certain questions suggest that economics is a confused discipline, a fake science whose findings cannot be a useful basis for making policy decisions. That view is unfair and uninformed. It makes demands on economics that are not made of other empirical disciplines, like medicine, and it ignores an emerging body of work, building on the scientific approach of last week’s winners, that is transforming economics into a field firmly grounded in fact. It is true that the answers to many “big picture” macroeconomic questions — like the causes of recessions or the determinants of growth — remain elusive. But in this respect, the challenges faced by economists are no different from those encountered in medicine and public health. Health researchers have worked for more than a century to understand the “big picture” questions of how diet and lifestyle affect health and aging, yet they still do not have a full scientific understanding of these connections. Some studies tell us to consume more coffee, wine and chocolate; others recommend the opposite. But few people would argue that medicine should not be approached as a science or that doctors should not make decisions based on the best available evidence. As is the case with epidemiologists, the fundamental challenge faced by economists — and a root cause of many disagreements in the field — is our limited ability to run experiments. If we could randomize policy decisions and then observe what happens to the economy and people’s lives, we would be able to get a precise understanding of how the economy works and how to improve policy. But the practical and ethical costs of such experiments preclude this sort of approach. (Surely we don’t want to create more financial crises just to understand how they work.) Nonetheless, economists have recently begun to overcome these challenges by developing tools that approximate scientific experiments to obtain compelling answers to specific policy questions. In previous decades the most prominent economists were typically theorists like Paul Krugman and Janet L. Yellen, whose models continue to guide economic thinking. Today, the most prominent economists are often empiricists like David Card of the University of California, Berkeley, and Esther Duflo of the Massachusetts Institute of Technology, who focus on testing old theories and formulating new ones that fit the evidence. This kind of empirical work in economics might be compared to the “micro” advances in medicine (like research on therapies for heart disease) that have contributed enormously to increasing longevity and quality of life, even as the “macro” questions of the determinants of health remain contested. Consider the politically charged question of whether extending unemployment benefits increases unemployment rates by reducing workers’ incentives to return to work. Nearly a dozen economic studies have analyzed this question by comparing unemployment rates in states that have extended unemployment benefits with those in states that do not. These studies approximate medical experiments in which some groups receive a treatment — in this case, extended unemployment benefits — while “control” groups don’t. These studies have uniformly found that a 10-week extension in unemployment benefits raises the average amount of time people spend out of work by at most one week. This simple, unassailable finding implies that policy makers can extend unemployment benefits to provide assistance to those out of work without substantially increasing unemployment rates. Other economic studies have taken advantage of the constraints inherent in a particular policy to obtain scientific evidence. An excellent recent example concerned health insurance in Oregon. In 2008, the state of Oregon decided to expand its state health insurance program to cover additional low-income individuals, but it had funding to cover only a small fraction of the eligible families. In collaboration with economics researchers, the state designed a lottery procedure by which individuals who received the insurance could be compared with those who did not, creating in effect a first-rate randomized experiment. The study found that getting insurance coverage increased the use of health care, reduced financial strain and improved well-being — results that now provide invaluable guidance in understanding what we should expect from the Affordable Care Act. Even when such experiments are unfeasible, there are ways to use “big data” to help answer policy questions. In a study that I conducted with two colleagues, we analyzed the impacts of high-quality elementary school teachers on their students’ outcomes as adults. You might think that it would be nearly impossible to isolate the causal effect of a third-grade teacher while accounting for all the other factors that affect a child’s life outcomes. Yet we were able to develop methods to identify the causal effect of teachers by comparing students in consecutive cohorts within a school. Suppose, for example, that an excellent teacher taught third grade in a given school in 1995 but then went on maternity leave in 1996. Since the teacher’s maternity leave is essentially a random event, by comparing the outcomes of students who happened to reach third grade in 1995 versus 1996, we are able to isolate the causal effect of teacher quality on students’ outcomes. Using a data set with anonymous records on 2.5 million students, we found that high-quality teachers significantly improved their students’ performance on standardized tests and, more important, increased their earnings and college attendance rates, and reduced their risk of teenage pregnancy. These findings — which have since been replicated in other school districts — provide policy makers with guidance on how to measure and improve teacher quality. These examples are not anomalous. And as the availability of data increases, economics will continue to become a more empirical, scientific field. In the meantime, it is simplistic and irresponsible to use disagreements among economists on a handful of difficult questions as an excuse to ignore the field’s many topics of consensus and its ability to inform policy decisions on the basis of evidence instead of ideology.

#### learning economic logic is cognitively valuable

Hirschman and Berman 14

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The new policies that resulted encouraged the growth of activities like patenting and entrepreneurship that saw science in terms of its economic value and linked it more closely with the marketplace (Berman, 2012).

## apocalypticism

### 2ac – at: k – apocalypticism

#### the 1ac isn’t catastrophism – it’s a hopeful, factual narrative that motivates public will and political engagement – understanding the negative impacts of climate change isn’t fatalism

Marlon et al 19

Jennifer, Researcher, School of Forestry & Environmental Studies, Yale University, How Hope and Doubt Affect Climate Change Mobilization, Frontiers in Communication, 21 May 2019 | https://doi.org/10.3389/fcomm.2019.00020, msm

Public will refers to a “social system's shared recognition of a particular problem and resolve to address the situation in a particular way through sustained collective action” (Raile et al., 2014, p. 105). Our research has implications for the roles that hope and doubt play in building public will and fostering engagement with climate change. First, despite increasing emphasis on hope in the climate communications subfield, our results indicate that there seems to be a “hope gap” among the public. Not only is there a lack of hope, there is also a lack of information and ideas about what may promote hope, especially among political moderates. This hope gap is especially relevant in the face of increasing climate impacts and insufficient national and international actions thus far to address the root causes of the problem. Second, it is important to distinguish between hope that is associated with political engagement and support for policies that address climate change (constructive hope) vs. hope that distances the issue and is linked with disengagement (false hope). Doubt can either reinforce hope in a constructive manner (i.e., via recognition of a problem), or in a negative manner (fatalistic doubt), which seems to hinder or be used to rationalize disengagement. In their constructive forms, doubt relates to recognizing that there is a problem—people are not acting—while hope helps to raise people up to address the situation; these findings are evidenced by the interaction between hope and doubt when predicting political intentions. Messages about the realistic solutions that exist for reducing climate change impacts can directly address the need for hope, while information about the known causes of climate change (Ranney and Clark, 2016) can address misconceptions that produce false hope. Likewise, messages that address common doubts about climate change may reinforce constructive hope, while information that addresses response-efficacy may help limit fatalistic doubt (e.g., the feeling that it is already too late). Perceptions of changing social norms and mobilization are common among those individuals who are hopeful and are strongly related to pro-environmental behavior. Hopeful messages can be informed by these ideas that emerged unprompted in the themes of Study 1 as they are likely to continue to resonate with the public. Such stories would focus on seeing others taking action, information about changing social norms and growing awareness among the public (Pew Research Center, 2018), information about the co-benefits of reducing global warming (e.g., clean air, economic growth, technological advancement), and stories about local to global initiatives that are succeeding. These ideas are already associated with hope in the public mind. Coupling these kinds of stories with news about the threat are likely to be more effective than if solutions are presented separately (Witte, 1992). Moreover, solutions are often presented with a conflict frame, rather than with an innovation or mobilization frame (Hart and Feldman, 2014). Our research is consistent with the positive impact of an innovation or mobilization frame insofar as these ideas are already common among hopeful appraisals made by the public. Hope and efficacy can also be promoted jointly by demonstrating the value and power of interpersonal communication about climate change, particularly when it is face-to-face (Clark and Brennan, 1991). Encouraging communication about both the physical and social dimensions of climate can help empower participants and promote action. While the “information deficit” model is now widely recognized as flawed, obtaining accurate information about cause and effect for many problems remains a key element of learning. Experimental evidence shows that acquiring new information about the physical mechanisms behind the greenhouse effect can transform attitudes about global warming (Ranney and Clark, 2016). Understanding the strength of the scientific consensus on climate (i.e., 97% of climate scientists are convinced by the abundant evidence that global warming is happening and human-caused) is linked to greater support for climate policies, and yet is largely underestimated (van der Linden et al., 2015). Social influence approaches are also shown to be effective at promoting behavior change, such as leveraging community leaders to promote action in communities and perceiving social norms supportive of actions (e.g., Abrahamse and Steg, 2013). Conveying the widespread support for action on climate in the US, even among conservatives and Republicans (Leiserowitz et al., 2018), can also help to reduce pluralistic ignorance (Geiger and Swim, 2016). Structural, institutional, and policy factors are also central in supporting individual and collective action. The appraisals absent from or limited in our content analysis of hope also yield insights that might inform efforts to build public will. Limited appraisals invoking scientific and technological advances, for example, suggest that these may be less engaging than messages relating to movement building or other social efforts. Technology and scientific advances explicitly being used by family and friends, or in the context of social organizing, however, may be more salient. Such “peer effects” have been documented through the diffusion of solar photovoltaic panels in communities, for example, where the adoption of the new technology by homeowners in the area increases the probability of additional installations (Bollinger and Gillingham, 2012). Other research has demonstrated the importance of addressing perceived social norms in the diffusion of environmentally friendly behaviors more broadly and highlights the effectiveness of these frames in increasing pro-environmental behaviors (Cialdini, 2007). Highlighting pro-environmental actions also directly counters common doubts about climate change, such as that humans are innately apathetic and greedy, or that change is too difficult or costly. In general, the findings across two studies suggest a hope gap among the American public, despite the myriad efforts underway to address climate change at individual to international scales. Our data suggest that Americans by-and-large are not hearing about these efforts. Yet, those who do feel hopeful are supported by hopeful beliefs, are more likely to engage in pro-environmental behaviors and to support policy. In addition, we find some evidence that there is such thing as a “healthy dose of doubt”–that understanding the scope and seriousness of the threat can also serve to support public will and reinforce engagement with climate change.

#### use of risk and fear in climate predictions is good – motivates positive responses

Beck 10

(Ulrich, Professor of Sociology at University of Munich, the British Journal of Sociology Visiting Centennial Professor at the London School of Economics and Political Sciences, and, since 2009, Senior Loeb Fellow at the Harvard Design School, “Climate for Change, or How to Create a Green Modernity?”, Theory Culture Society 2010 27: 254)

Sixth thesis: The political explosiveness of global risks is largely a function of their (re-)presentation in the mass media. When staged in the media, global risks can become 'cosmopolitan events'. The presentation and visualization of manufactured risk makes the invisible visible. It creates simultaneity, shared involvement and shared suffering, and thereby creates the relevance for a global public. Thus cosmopolitan events are highly mediatized, highly selective, highly variable, highly symbolic local and global, public and private, material and communicative, reflexive experiences and blows of fate. To understand this, we have to draw upon the picture of 'Mediapolis' so minutely and sensitively painted by Silverstone (2006) and the picture sketched much earlier by Dewey (1946). There Dewey defends the thesis that it is not actions but their consequences which lie at the heart of politics. Although he was not thinking of global warming, BSE or terrorist attacks, his theory can be applied perfectly to world risk society. A global public discourse does not arise out of a consensus on decisions, but rather out of disagreement over the consequences of decisions. Modern risk crises are constructed out of just such controversies over consequences. Although some insist on seeing an overreaction to risk, risk conflicts do indeed have an enlightening function. They destabilize the existing order but can also be seen as a vital step towards the construction of new institutions. Global risk has the power to confuse the mechanisms of organized irresponsibility and even to open them up for political action. This view of 'enforced enlightenment' and 'cosmopolitan realism' opens up the possibility that the 'manufactured uncertainties' and 'manufactured insecurities' produced by world risk society prompt transnational reflexivity, global cooperation, coordinated responses against the background of 'cosmopolitan communities of risk', so the same processes may also prompt much else besides. My emphasis on staging follows from the fact that my central concept is not 'crisis' but 'new global risk'. Risks are, essentially, man-made, incalculable, uninsurable threats and catastrophes which are anticipated but which often remain invisible and therefore depend on how they become defined and contested in 'knowledge'. As a result their 'reality' can be dramatized or minimized, transformed or simply denied, according to the norms which decide what is known and what is not. They are, to repeat myself, products of struggles and conflicts over definitions within the context of specific relations of definitional power and the (in varying degrees successful) results of staging. If this is the core understanding of risk, then this means that we must attach major significance to media staging and acknowledge the potential political explosiveness of the media. How does this correspond to empirical facts? As Cottle (2009) argues, the release in early 2007 of the latest International Panel on Climate Change report proved to be a transformative moment in the news career of climate change (IPCC, 2007). At first climate change featured relatively infrequently in scientifically framed news reports, then it was contested by a small group of news-privileged climate change sceptics, and finally it came of age as a widely recognized 'global risk' demanding responses from all the world's nations. If IPCC predictions and those of more recent scientific modelling come to pass over the next couple of decades, then climate change may yet prove to be the most powerful of forces summoning a civilizational community of fate into existence. The Western news media's spectacular visualization of climate change, presenting dramatic and symbolic scenes collected from around the world, has undoubtedly helped to establish the latter's status as a widely recognized global challenge and serves to illuminate a third-generational modernity staged as global spectacle. Here the news media do not only function in terms of a global focusing of events; rather, the news media adopt a more performative stand, actively enacting certain issues as 'global risks'. Images which function in a more indexical sense to stand in for global processes of climate change now regularly feature across the news landscape. And here some sections of the news media have sought to champion climate change awareness, often through visually arresting images which aim to register the full force and threat produced by global warming around the world. In images such as these, the abstract science of climate change is rendered culturally meaningful and politically consequential; geographically remote spaces become literally perceptible, 'knowable' places of possible concern and action. This performative use of visual environmental rhetoric is not confined to selected newspapers; interestingly enough, it has become mainstream. In this way the threat and reality of global climate change has been 'brought home', especially in the West, as possibly 'the' global risk of the age. On the other hand, the continuing pull of the national within the world's news formations and discourses cannot be underestimated. This is, of course, true in the case of wars. Wars continue to be reported through spectacles tinted by national interests. However, as climate change moves into a new phase of national and international contention, countries, corporations and citizens are also negotiating their respective roles and responsibilities, whether in respect of national policies of mitigation and adoption, or through governmental support of developing countries confronting the worst effects of global warming. Here, too, actions and reactions are often reported in and through national news prisms and frames of reference. However, the narrative of global risk is misinterpreted as a narrative of the Western 'emergency imaginary' (Calhoun, 2004). It is not a 'singing into the apocalypse', and it is not simply a 'wake-up call to reality'. Rather it is about expectation and anticipation, it is about a narrative to dream differently. 'Emancipation' is the key word. Either the ecological concern manages to be at least as powerful as this hunger for modernization or it is condemned to repeated failure.

#### evaluation of risk is enabling – prefer specific evidence

Moser and Dilling 11

The Oxford Handbook of Climate Change and Society

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Clearly these findings pose difficult dilemmas for communicators: Should we avoid telling what scientists have established as facts and reasonable outlooks about the seriousness, pace, and long-term commitment of climate change? Should we instead only discuss energy- and money-saving actions and convey pictures of hope by focusing on the easy actions, the 'doability' of mitigation? Should we perpetuate the idea that there are fifty 'simple ways to save the planet,' just to spare lay publics rather appropriate anxiety? Existing research suggests otherwise. While neither alarmism nor Pollyannaism seem to yield desired results, wise integration of strategies may well result in greater engagement. First, communication that affirms rather than threatens the sense of self and basic world- views held by the audience has been shown to create a greater openness to risk information (Kahan and Braman 2008). Second, risk information and fear-evoking images should be limited and always be combined with messages and information that provide specific, pragmatic help in realizing doable solutions. These solutions must be reasonably effective in reducing the problem, especially together with other solutions being implemented. Importantly, communicators must establish a sense of collective response, especially by people in like social and cultural groups. Moreover, solutions should be broadly consistent with individuals' personal aspirations, desired social identity, and cultural biases (CRED 2009; Segnit and Ereaut 2007). Finally, given the ideological polarization around responses to climate change (discussed below), the legitimate experience of fear and being over- whelmed, and the deep and lasting societal changes required to address the problem, there is an important place for facilitated dialogue and structured deliberation of the issues as they emerge (Kahan and Braman 2006). Such deliberation has been shown to improve interpersonal knowledge and trust of people with very different values, provide critical social support and affirmation, increase openness to different opinions and risk information, and thus to enable decision making, rather than obstruct it (Nagda 2006).

#### imaging catastrophic outcomes creates a safe space to craft hypothetical solutions – they’re stopped by their fear of fear

Yusoff and Gabrys 11

Kathryn Yusoff and, researcher at the Environment Center of the University of Lancaster, Jennifer Gabrys 11, professor of design at the University of London, “Climate change and the imagination”, <http://www.marymattingly.com/images/press/WIREs_ClimateChange.pdf>

Buell suggests that this framing reveals that the greatest threat is perceived not as the threats themselves, but our perception of them. Research into public perceptions of climate change has revealed confused61 and often contradictory understandings of climate change,62 which can hinder the ability to identify effective strategies to address it.63–65 This perceptual confusion often becomes manifest over time in shifting opinions about the risk of climate change and its veracity, and is highly dependent on the preoccupations of media coverage.66 Buell also suggests that there is a perception that environmental concern will only be activated by a great ecological disaster: a ‘Great Ecological Spasm’, as he calls it.60 But this, he says is ‘only a permutation of the first: in both cases, the imagination is being used to anticipate and, if possible, forestall actual apocalypse’.60 What becomes clear is that the imagination not only shapes the perception of the climate change but co-fabricates it in ways that effect the possibilities to act on it. In this sense, imagination is not external to the object of study (climate change), but actively produces it as an event in differentiated ways: rational, apocalyptic, modernist, scientific, utopic (heralding the end of capitalism), and ontological. Much has been said against the ‘doom-laden’ narratives of climate change as being unhelpful,67 a distraction, or simply as the source of misinformation, and research that has examined the shifting tides of media attention that are given to climate change has borne out this critique. But to frame all such attempts to engage with disastrous or catastrophic renderings of climate change as negative misses the point of the creative role of fiction and the cautionary offerings of the disaster.68,69 A story at its best, asks us to imagine alongside the protagonist of a story the full range of emotional challenges and difficult choices that have to be made once all the usual landscape markers and reference points have shifted or disappeared. While films like The Day after Tomorrow focus on the catastrophic event of climate change and revel in its spectacular destruction,70 Cormac McCarthy’s The Road (2006) and J G Ballard’s The Drowned World (1999) push us toward imagining what it will be like to live on through the disaster, in a post-apocalyptic world of everyday survival. Novels such as The Road and Margret Atwood’s Year of the Flood71 provoke us to think about what it might be like to endure and survive, both emotionally and practically, within changed environments. Distinct climate-change works to emerge in recent years include Ian McEwans’ Solar (2010) about a washed-up academic on the international climate-change circuit; Doris Lessing’s Mara and Dann (1999) set in a new Ice Age in Africa; and Kim Stanley Robinson’s trilogy, Forty Signs of Rain (2004), Fifty Degrees Below (2005), and Sixty Days and Counting (2007), which deals with ecological and sociological themes of climate change through the lens of the National Science Foundation, while exploring themes of alternative utopianism.72 Frederic Jameson writes about Stanley Robinsons’ Science Fiction (SF): ‘Utopia as a form is not the representation of radical alternatives: it is simply the imperative to imagine them’.73 Frederic Jameson sees SF as a crucial intervention in social thought, a cognitive space of critical imagining that offers a ‘representational mediation on radical difference’.73 The utopian potential of SF is its ability as a narrative form to imagine an outside to scientific knowledge, while maintaining a dialectic relation to it, thus making us aware of our epistemic limitations.74 As James Kneale and Rob Kitchin argue, SF can be seen more as ‘a gap: between science and fiction’, an ‘interest in the fragile fabrication of mimesis’ that offers ‘a privileged site for critical thought’.75 What writers like Stanley Robinson make clear is that science fiction takes the most speculative dimensions of science and imagines what these speculations might look like if they were to become manifest in the world.76 In this sense, speculative science fiction is a cultural meditation on risk. Imaginings of devastated social and environmental landscapes are often absent from political and scientific understandings of climate change, which take epistemological or rational approaches, often eschewing speculative or polemical descriptions of future scenarios. Yet, fiction can allow us to trace the contours of a changed world and to experience its dislocation across social, cultural, and emotional registers. Many environmental disaster novels are then landscape novels in which the protagonists must cultivate a relation to the destroyed and changed landscape in order to survive, as Ballard describes: This growing isolation and self-containment, exhibited by the other members of the unit. . . reminded Kerans of the slackening metabolism and biological withdrawal of all animal forms about to undergo a major metamorphosis. Sometimes he wondered what zone of transit he himself was entering, sure that his own withdrawal was symptomatic not of a dormant schizophrenia, but of a careful preparation for a radically new environment, with its own internal landscape and logic, where old categories of thought would merely be an encumbrance (Ref 77). This fictional journey then becomes both a form of emotional and social adaptation for the protagonists and the reader, a means to rethink a radically new environment. Held as we are through emotional bonds formed with the protagonists, the passage through altered landscapes may be crucial to how we culturally adapt to the new landscapes of climate change. Fear and hope about climate change may or may not drive action, but they are a part of how we register and understand environmental change, and in this sense they are instructive to understanding the imaginings not just of futures, but also of modes of adaptation. In this sense, the imagination of climate change landscapes is an entry point for examining environmental relations to identity, place, practices,78 and nonhumans,79 what can be referred to as the environmental imagination.

### 2ac – at: swyndegouw

#### swyndegouw is wrong – we need to take immediate action to address runaway, catastrophic warming

North 8

Peter North (Department of Geography, University of Liverpool). “A Sympathetic Critique of Localisation.” September 30th, 2008. https://www.transitionculture.org/2008/09/30/a-sympathetic-critique-of-localisation-by-peter-north/

Erik Swyngedouw (2007) has argued that climate change, and, by implication I would add, peak oil, is cast by elites as a ‘post-political’ problem. ‘We’ are all in danger of disaster, and ‘we’ must ‘all’ do something about it. No one is to blame, no one must be made to suffer or be overthrown, and it is clear what ‘we’ must do – adopt sustainable development. Who could be opposed to something so simple? Who would claim to be ‘unsustainable’? In contrast, I argue that there is no cosy consensus, and that responses to peak oil and climate change are deeply political. Following Heinberg (2004), I argue that there are four potential response scenarios to these problems. First, the solution seemingly adopted by neo-conservatism; geopolitical and military struggle aimed at dominating the world’s limited supplies of petrochemicals and to manage future climate-inspired conflict (see also Abbott [2008]; Busby [2008]) . Second is the technocentric cornucopianism of elite free-market enthusiasts, critics of ‘limits to growth’, and climate change sceptics. They argue that market economies are creative enough to solve problems through solutions of which we cannot as yet even dream, and that technology will overcome the peak oil and climate crises. Future generations will be better placed to pay the costs and generate solutions far more cheaply (Lomborg 2001; 2007). These are the two elite strategies. The past two to three years has seen the emergence of at least a putative new social movement, responding to concerns about peak oil and climate change. Carbon Rationing Action Groups, anti airport protesters ‘Plane Stupid’, protesters against coal extraction ‘Leave it in the ground’, the summer climate camps, and the transition movement are all working quite locally, at grassroots level, to develop local solutions to peak oil and climate change based on developing much more resource-poor yet enjoyable and fulfilling livelihoods based in more localised economies . They support Heinberg’s third scenario. The double whammy of peak oil and climate change fatally damages the neoliberal project of building a globally integrated free market economy based on producing goods and services wherever they can be produced most ‘efficiently’, i.e. the most cheaply, and under a political economy of cheap oil and externalised emissions. Peak Oil means the end of cheap oil, while climate change means that currently externalised emissions will need to be counted, fundamentally changing the calculus about where economic activity should be located. Localisers argue that peak oil and climate change should be seen as an opportunity to build more ecologically sustainable, more local and more convivial economies. Xenophobes provide Heinberg’s final scenario: an end of all travel and pulling up the drawbridge to protect the climate change winners and those sitting on energy resources from the losers . Given the reality of fuel poverty and the reliance of many in rural areas on affordable fuels, social movement struggles could emerge arguing for cheap, not less, oil, such as those that emerged in Britain in 2000 (Doherty, Paterson et al. 2002; Robinson 2002; Doherty, Paterson et al. 2003; Robinson 2003). Of course, we have been here before. Human history has been a catalogue of imagined catastrophe, apocalypse, millennialism and the “end of days.” In the past, catastrophe has been real as societies have come up against ecological limits (Diamond 2006; Homer-Dixon 2006), real barbarians, or succumbed to disease (Diamond 1998). But we have also had many false alarms. Malthus erroneously predicted mass starvation in the early 19th century, while neo-Malthusianism predicted disaster in the 1880s (before nitrate fertilisers solved the problem), at the turn of the twentieth century (as guano ran out, before synthetic fertilisers), and again in the 1970s (before the green revolution) (Ehrlich 1971; Meadows 1974). Humanity would be doomed in the 1930s from mass air attack, and in the 1960s-80s from nuclear war and nuclear winter. Environmental disaster would come from the shutdown of the Gulf Stream or from ozone layer depletion. Religious doom was foretold by millennialism, studies of the Book of Revelation or of Nostradamus, or by numerology. Apocalyptic Christian Zionism predicts the immanent rapture, where the saved are whisked off the planet before the end of days. The Y2K ‘Millennium Bug’ meant the death of technological society.Collapse is regularly foretold, while real problems – such as economic crises – are seldom accurately predicted. Sherden (2000:1) quotes Issac Asmimov: “If I were to guess what people are generally most insecure about, I would say it is the content of future. We worry about it constantly“. Any analysis of peak oil must have this in mind, especially when advocates of peak oil rule out the possibility that there may be new discoveries of oil in currently inaccessible places, and are over-sceptical about the possibility of technological advancement (see Kunstler [2006:100-146]; Roberts [2004:66-90] and Heinburg [2004:117-138]). In their response to the Club of Rome’s original “Limits to Growth” report, the team at Sussex University (Cole, Freeman et al. 1973) argued that a report on the year 2000 written in 1870 would not have seen oil as a resource at all, foreseen mass private transport, aircraft, or considered the possibility of nuclear power, plastics, or synthetics, (or, we might add, technologies emerging after the 1970s like the mobile phones or the internet). There is a difference between problems that come up against fundamental engineering, geological or physical limits, and problems that we just haven’t solved yet. The global oil price rises of mid-2008 were as much result of high demand from the BRICs, speculation, geopolitical insecurity and a lack of refining capacity as – yet – global limits (Pratley 2008). Peak oil advocates, of course, argue that the fundamental problem of lack of new discoveries remains, and that price volatility is to be expected around the peak: “the days of skyrocketing oil prices will be back soon enough. Will we be ready?” asks Heinberg (2008) in his blog. September 2008 saw the highest ever one-day rise in oil prices. We do not know the reality. If there is no agreement on peak oil, there does, however, appear to be more of a consensus about the dangers of climate change, according to the IPCC (2007). Global long series temperature readings and observable extreme weather events from the mass deaths from heatstroke in Europe in 2005, Hurricane Katrina and South Asian cyclones, European flooding, droughts in Sudan, Southern Africa and Australia, and forest fires in Greece and California all suggest that the planet is warming (Lynas 2007), perhaps dangerously heating (Lovelock 2006). While the levels of historical and existing emissions mean that global warming of 2o is probably unavoidable, immediate action is required to avoid dangerous, runaway climate change as the ‘sleeping giants’ of positive feedback mechanisms kick in. Heating much above 2o might well mean the unfreezing of methane hydrates in permafrost and the deep ocean, pumping billions of tons of greenhouse gasses fourteen times as potent as CO2 into the atmosphere, leading to mass heating, the switch off of the Monsoon, the drying of the African and South American rainforest, and rapid, catastrophic climate change literally within a few years (Pearce 2007). This paper is written from the perspective of those who argue that while doom has been erroneously forecast in the past, and that the peak oil debate may be latest manifestation of this given that there is so much debate on the real extent of the planet’s petroleum reserves, the threat of runaway climate change now seems immediate given the observable consensus on this issue and the marginality and dubious political economic connections of the few sceptics (Dale 2007; Jacques 2008) – and rules out solutions to peak oil given existing technologies. Of course, a technologically optimistic reading would be that the fecundity of capitalism will prevail over ecological crises (Buck 2006), as through ecological modernisation technology will generate solutions to climate change (Nordhaus and Shellenberger 2007; Walker and King 2008). But again, this is a political position. It cannot be assumed in advance that technological breakthroughs are inevitable – the necessary technologies might not be available in time, or there might be fundamental physical or engineering problems that mean some of them never come to fruition (Tyndall Centre 2008:46). We cannot assume that a free market capitalism that led to two world wars and endless imperialist conflict throughout the twentieth century, or that can provide endless consumer variety for the globally wealthy but not clean water for the globally poor will prioritise a problem that will manifest itself far beyond this quarter’s figures. For technological solutions to be forthcoming, we need an effort like Roosevelt’s New Deal or the Manhattan or Apollo projects (Nordhaus and Shellenberger 2007; NEF 2008). Doubts remain about the likelihood that the political will for this is there, or that free market economics is up to the task (Neale 2008). If the sceptics are right, all those concerned about climate change have done is waste their time and forgo consumption, whereas if the consensus is right and no action is 3 could be horrific. Taking the precautionary principle therefore seems prudent. And as given existing or in the pipeline technologies localisers cannot see a solution to peak oil that involves the exploitation of new sources of oil that is compatible with the avoidance of dangerous climate change, this paper assumes we do seem face a double whammy rather than another false apocalypse, and that responses to it are political, not consensual. On this basis, I now go on to examine the political implications of one of the possible responses, localisation.

#### our portrayal of catastrophic climate change is a radical undercutting of the liberal myth of progress – envisioning the extinction of the human race is a demand for new ways of living to confront structures that have created the climate crisis.

Ginn ‘15

Franklin, Lecturer in Human Geography @ The University of Edinburgh in the School of Geosciences and member of the Institute of Geography, Annals of the Association of American Geographers, Vol. 105, Issue 2, pp. 351-359, published online February 6th, 2015, “When Horses Won't Eat: Apocalypse and the Anthropocene”, Taylor & Francis Online

Thinking of the Earth today and not, at the same time, thinking of its devastation is increasingly difficult. Popular apocalyptic stories multiply on screen: resource extraction and imperialism (Avatar [2009]); the vanity and depression of the rich (Melancholia [2011]); alien migration and hybridization (District 9 [2009]; Falling Skies [2011]); zoonotic pandemics (Contagion [2011]); climate disaster (The Day After Tomorrow [2004]; The Colony [2013]); the end of friendship between human and animal (After Earth [2013]; The Life of Pi [2013]), as well as in text (The Possibility of an Island [Houellebecq 2005]; The Windup Girl [Bacigalupi 2009]; the MaddAddam trilogy [Atwood 2013]), and in landscapes (witness the popular and critical interest in ruins). The flavor and political tone varies, too, from conservative family drama, to regressive ecology, to exuberant tales of techno-natures to come. Such visions are an imaginative force oriented toward the future, driven by pervasive anxiety about the prospects for life.**∂** Of course visions of civilization's end are nothing new, and indeed every culture seems to obsess over its own ruination (Hall 2009). We must therefore historicize. “Our” current time is the Anthropocene, that new geological epoch in which humans have become a planetary force, according to analysis of the lithographic, geochemical, biological, and atmospheric records of human activities (Zalasiewicz et al. 2011). For some, the Anthropocene signals a final enclosure of politics and culture within ecology: a new geo-politics in which Earth is the sovereign authority and humans are inmates of a planet-sized camp in a permanent state of emergency. For others, it is an occasion to double down on techno-hubris and call forth more fevered bouts of rationality and management (Oxford Martin Commission 2013). Optimistic commentators hope that naming this new epoch might accelerate action on the pressing challenges of our time—that the Anthropocene is an “unprecedented opportunity” (Ellis et al. 2013, 7978), a wake-up call for “planetary stewardship” (Steffen et al. 2011), or just good to think with (Ellsworth and Kruse 2013). Critics remind us that the unitary human of the Anthropocene hides political difference, and risks elevating a particular kind of consumer to a motor of history (Malm and Hornborg 2014). For the purposes of this article, however, the very act of asking the question, “Is this the Anthropocene?” demonstrates that we have moved into an era of anxiety about the prospects for planetary life. Indeed, the Anthropocene might be defined as an emotional condition as well as a physical event (Robbins and Moore 2013). It is worth remembering that the Anthropocene arrives not with a socioecological transition (an event), but rather with our capacity to measure and to read signs of that event through scientific or artistic means (Szerszynski 2012). Only once we can measure, read, and therefore sense how the Earth has become sensitive do we enter the Anthropocene. Thus if the Anthropocene is partly formed through “affective atmospheres” (Anderson 2012) and ways of representing that constrain and enable political imaginaries, we should consider these as important components of socioecological transition.**∂** In this article I suggest that fantasies of apocalypse are both a product and a producer of our current epoch—the Anthropocene—and that they also take us beyond this epoch by confronting what might be to come. I contend that “Anthropocene apocalypse” reveals how we have always been more-than-human in ways at once both geological and biological, ways through which earth forces have been folded within us. Against the dominant grain in social science and drawing on recent work in ecocriticism, I offer a hopeful reading of apocalypse. If contemporary apocalypse emerges as a nightmare of the Anthropocene's socioecological risks, it also produces something over and above anxiety—something escapes, and such excesses might be mined for their transformative kind of feeling, not just criticized for their politically regressive negativity. The article therefore focuses on apocalyptic cinema, examining how film offers us a way of measuring our sensitivity to the Earth (rather than measuring the Earth's sensitivity to human activities). The article analyzes one avant-garde, critically acclaimed film: The Turin Horse (2011), directed by Béla Tarr. Tarr's film represents a particular kind of apocalyptic vision: uncompromising, difficult, culminating in cosmic emptiness that is implied but not presented. It is far from a Hollywood blockbuster. The film nonetheless distills into an intense form many anxieties of Anthropocene apocalypse, making it a suitable vehicle through which to explore the cultural politics of how we are sensitized to the Earth.∂ Postpolitical Apocalypse, Ecocriticism, and Film∂ Can a film make someone think or act differently? Can apocalyptic cinema change the world? We can characterize two prevailing perspectives on apocalyptic cinema that respond to these questions in very different ways. The first, an eco-Marxist perspective dominant in geography, suggests that “quite simply apocalypticism is politically disabling” (Katz 1995, 277). The second, more prevalent in social theory and ecocriticism, to summarize crudely, seeks to locate cinema's potential to “reframe perception” for progressive ends (Rust, Monani, and Cubbitt 2013, 11). This article thus seeks to connect geographical debates about socioecological futures to those taking place in the interdisciplinary field of the environmental humanities.∂ In a series of articles, Swyngedouw (2010, 2013) has laid bare what he sees as the politically regressive logic of apocalypse. In Swyngedouw's analysis, modern ecology is a thoroughly depoliticized enterprise in which politics has been replaced by policy and governance. His paradigmatic example is climate change, in which carbon dioxide has been fetishized to stand in as “the problem,” masking the underlying cause: the unequal socioeconomic and geopolitical networks behind each unit of carbon dioxide. Negotiations turn on parts per million, thresholds are set at atmospheric concentration levels, and sustainable policies, such as carbon pricing, are the only game in town. Even radical environmentalists translate their goals into scientific measurements by fixating on carbon dioxide levels. **Capitalism—in particular its neoliberal variegation—remains uncontested.** As Swyngedouw puts it, implicit in crisis and apocalypse is a universal threat: We are all potential victims, ultimately in it together. Swyngedouw (2010) argues that “the imaginary of crisis and potential collapse produces an ecology of fear, danger and uncertainty while reassuring the ‘people’ … that the techno-scientific and socio-economic elites have the necessary tool-kit to readjust the machine such that things can basically stay as they are” (11). The end of everything is an ongoing crisis that we are assured can be managed **within the current system**; apocalyptic imaginaries become a key way to sustain this postpolitical consensus. The politically regressive nature of apocalypse is therefore its tendency to entrench further forces that precipitate catastrophe in the first place.**∂** Since the late 1990s the burgeoning field of ecocriticism has been analyzing the potential of environmental film and literature, including apocalyptic visions, for consciousness raising that might inculcate a sense of planetary care (Levene 2013; Rust, Monani, and Cubbitt 2013). The prescriptive moral tone of some progressive ecocritical readings and the assumed link between consuming a proenvironmental vision and a more enlightened planetary citizenry are, of course, naive to say the least (Berger 1999; Buell 2003; Hulme 2008). Even “progressive” environmental films, including apocalyptic films intended to shock us out of complacency, do not easily escape the postpolitical critique outlined earlier. A film like Avatar, for example, while showcasing the evils of an imperialist, militarized capitalism, symptomatically falls back on troubling notions of a sovereign nature, complete with a native people, the Na’vi. Other films, such as Melancholia, explicitly embrace passivity in the face of disaster as the only possible alternative to Hollywood bombast (wherein techno-scientific knowhow saves the day; Latour 2013a). Yet other ecocritics suggest that films, although always suffused in the prevailing postpolitical ideology of the day (eco-doom as consumerist spectacle), do not robotically follow such ideologies, but also contain ideological contradictions and excesses (Ingram 2004). Such critics are also aware that, historically, apocalypse has generated highly varied political positions, from the regressive to the revolutionary (Skrimshire 2014). For Hageman (2013), the power of ecofilms comes not from “explicit ecological programming,” but “their contradictions,” and “the fissures through which we may glimpse and further imagine an ecology without capital—an ecology to come” (66). Hageman thus rereads film against the grain of hegemonic ideology, and suggests that we approach ecofilm not by asking what a film does (does it change people's actions?), but rather what a film can do. In other words, instead of assessing measurable changes in people's actions, we can speculate how ecofilm might offer novel ways to think about the future and in so doing relativize the present.∂ To understand how film works, we can draw on ecocritic Ivakhiv's ecological approach. Ivakhiv (2013) suggests that films have internal ecologies, and that this makes cinema different from other cultural forms. The main difference, according to Ivakhiv, is film's motility and openness: Each film's internal ecology is poised to be read in a different way, to mutate, and by drawing viewers into a relationship become more than merely internal to the film, by overflowing the film and making connections to the world beyond. Film draws viewers into its world along three vectors: the spectacular, which is the immediacy of affect and response in the experience of seeing a film; the narrative, or the recognition of connection through scenes that make up the film world; and the exo-referential, which is the recognition of meaningful reference to things outside the film. Through each of these three vectors—the spectacular, the narrative and the exo-referential—films can be “affectively generative” and can change the viewer (Ivakhiv 2013, 300). The force of these vectors is neither preordained nor contained in the film alone, but emerges from the ecological relationship among viewer, world, and film. Such capacities make cinema more than programmed texts readable in only one way.∂ Drawing on Hageman and Ivakhiv to read the spectacular, narrative, and exo-referential ecologies of The Turin Horse, I contend that the apocalyptic differs from other ecofilms, which might aim to shock the viewer, or to prompt an emotional reaction to suffering, or to mourn, to bear witness, or to inspire. Although apocalyptic film can do those things, **its more important function is to prompt a yearning for something different, a transformation—the beginning of a new world, not the end of an old one—as well as prompt the question of how to respond to an uncertain future.** Apocalyptic cinema is not, of course, preprogrammed to do this; rather, a desire for the new emerges out of the ecological relationship among film, viewer, and world. The “new” here, I demonstrate, involves confronting the disempowering deep time horizons implicit in the Anthropocene as well as the geological and biological commitments of the anthropos of the Anthropocene.**∂** The speculative style of this article is, of course, not intended to supplant more grounded analyses of socioecological politics and transition. We know from such work that apocalypse is already here, it is just not very evenly distributed (to paraphrase novelist William Gibson). Moreover, the capacity to be affected by film is governed by a distribution of the sensible that follows lines of privilege (Rancière 2004). Indeed, cinematic representations of Anthropocene apocalypse might be characterized as entertainment for a privileged elite. But as Castree (2014) argues, representations produced and consumed by the powerful have force and should not escape our critical attention. If, as I have suggested earlier, the Anthropocene is defined as much by anxiety as by transitions in earth systems, then it is crucial to interrogate how any cultural elite produces and consumes knowledge and imaginaries of the future as well as the physical science base.**∂** The Turin Horse: Cosmic Unmaking and Hope in Time∂ Hungarian director Béla Tarr's work spans thirty years. Tarr's early films, beginning with The Prefab People (1982), grapple with the problems of communist Hungary, and his later works chart the hollowness of the good life under capitalism. His most famous film, the seven-hour Satantango (1994), follows the breakup of a collective farm after the end of communism. Tarr's films also get darker and darker in tone, culminating with the final scenes of his last film, The Turin Horse (2011, 146 minutes), in which the sun and all light are extinguished. Tarr describes starting his career with the desire to show how messed up the world is, but that gradually he “began to understand that the problems were not only social; they are deeper. … They were cosmic,” which led to his style becoming ever simpler and by the end “very pure” (Tarr 2012).∂ The Turin Horse describes six days on a bleak, windswept, and dusty farmstead. After the opening scene, a mesmeric close-up of a horse-and-cart journey home, the horse (“played” by a horse called Ricsi) is shut away in her stable. Each day the peasant farmer Ohlsdorfer (played by János Derzsi) and his unnamed daughter (Erika Bók) repeat their routine: They get dressed, stare out the same windows, and eat the same meal (one boiled potato). The young woman has to dress her father each morning because his right hand is paralyzed; he seems barely capable even of tending to their horse. The film shows a pared down life without joy, although the audience is clearly expected to fear that worse might be to come in this antigenesis narrative arc. On the second day, despite being whipped, the horse refuses to move. We see their daily routines once again, but from slightly different angles and perspectives. On the third day, a drunken neighbor warns them of the encroaching final darkness in a long, rambling monologue. On the fourth day, the horse refuses to eat or drink. The well runs dry. On the fifth day, the farmer and daughter decide to flee with their horse. They load their possessions on their cart, and slowly the three disappear over the horizon. The camera stays fixed on a lone tree until forty seconds later we see the trio return, even more desperate and exhausted than before. The horse is shut away again, and does not reappear. On the sixth day, the storm has ended, but a great darkness has descended; their lamp gutters and dies. The film's closing shots are of the man worrying at a raw potato with one hand and the woman staring into her bowl; although we don't see the final breath, the end is inevitable.∂ On one level, Tarr's film is a Nietzschean vision in which the farmer and daughter fail to break out of their lives and drown in repetition as the cosmos slowly slides back to its dark origins. All Tarr's films are caught in a tension between the endless repetition of material events (the wind, the potato, a shot of pálinka) and the potential each being has for breaking out of that repetition, of exhibiting a will to power that can break with this history and bend other life to its own enhancement. The characters in The Turin Horse are caught between, on the one hand, as Rancière (2013) puts it in his commentary on Tarr's films, “the law of wind and misery,” and on the other, “the weak but indestructible capacity to affirm ‘honor and dignity’ against this law” (46). For Tarr's characters, affirming “honor and dignity” would mean not surrendering to environmental or apocalyptic forces, but striving for paths out of eternal repetition and confronting cosmic dissolution. The Turin Horse discloses potential for honor and dignity through three themes: the geological, the biological, and the temporal.∂ The elements play a strong role in The Turin Horse: incessant wind, the well running dry, and the life-sustaining fire. The film's soundscape is dominated by howling wind, which at times makes human speech impossible, and the encroaching darkness creates creeping dread and heightens the importance of the family's firewood and paraffin supplies. Wind, water, and fire are not a backdrop against which the “action” unfolds, but are active participants. This elemental emphasis creates, as Ivakhiv would have it, a spectacle that captures physical hardship rooted in earth forces, as well as perhaps the (off-screen) politics of land tenure. As well as a spectacle, though, the narrative prominence of the pair worrying about fuel mirrors conditions outside the film world (Ivakhiv's exo-referential element). As Mitchell (2011) has shown, fossil fuels were central to the emergence of modern liberal-democratic states, first as the entrenched material networks of coal extraction bred class politics, then as oil made possible the just-in-time energy distribution networks that fuel the global economy. From Mitchell it is a small step to acknowledge that the Anthropocene is a project done not by humans alone, but done with geological forces: laid down deposits of fossilized solar energy. Others have taken this to its next logical step, which is that as well as liberal democratic capitalism, geology has made possible modern carbon humans (Clark 2011). To summarize, fossil fuels are folded into the human: materially (think of pervasive endocrine disruption), through our embedding in sociotechnical systems that ultimately depend on fossilized energy (the notion that to be human is always already to be a tool user), and psychologically (our desires, hopes, and fears shaped by the geopolitics of oil). All this means that inasmuch as we might have become a geological force in the Anthropocene, “we” are also a “historically locatable capitalization on geo-power” (Grosz 2012, 975). In The Turin Horse it is the lamp that shows how wedded the man and woman are to the “geologic life” of the Anthropocene (Yusoff 2013). The woman gathers firewood and tends the fire each day—there is no electricity, only a supply of paraffin for their lamp. In the last days, the fire and lamp burn low, and—eventually—die. The pair is unable to relight the lamp, even though the woman assures her father that she has filled it. But faced with this mystery, rather than seek an explanation or another fuel source, the pair grope their way to bed in the dark. “What is all this?” the woman asks, as the sun vanishes; “I don't know, let's go to bed,” the man replies. The sixth day's separation of life from the sun (as the great darkness descends to block the ultimate source of fossil fuels) refers to the inevitability of the end of carbon humans not just in this film, but in our own world. The characters’ inability to respond to this crisis evokes the way in which imaginations of the Anthropocene have been colonized by fossil fuels.∂ Possibilities of a new kind of human linger at the edges of Tarr's film if only the pair can break out of the “law of rain and misery” and find other ways to harness earth energies. Hope, such as it is, lies with another character, however. In the film's opening scene, the man sits on his cart, buffeted by the wind. But he is unmoving—instead it is the horse that fights the wind, the horse that struggles to overcome the weather. The farm's residents are a knot of companion species bound together on a journey into darkness. As well as being makers of and made by Earth's geology, the horse signals how humans are made through the biological. Biophilosophers now make much of our originary relationality, the idea that the human is a strategic essentialism distilled from multispecies practices. We are, Bennett (2010, 113) puts it, “nested sets of microbiomes.” Relationality goes all the way in (to the 80 percent of our DNA shared with daffodils), and all the way back (our genome replete with remainders of canine viruses transmitted in the saliva of dog companions back in deep time; Haraway 2008). Just as the “short” Anthropocene was done with geological earth forces (fossil fuels), so too the “long” Anthropocene (which takes the domestication of grain as its starting point) was never a human project (these two are the main competing versions of the Anthropocene, although they are not incompatible). The first garden plant was a blow-in weed, an opportunist landing on garbage at the edge of a camp, tended by a speculative human: a partnership of convenience, not the effect of human genius (Doolittle 2004). Since then, palm oil, wheat, cows, and the weedy foot soldiers of empire have changed earth systems along with their human kin (De Landa 1997). That is to say that as well as suffering in it, nonhumans have been fundamental to creating the Anthropocene.∂ The film takes its title from an apocryphal tale that has Nietzsche throwing his arms around a horse being cruelly whipped in a Turin square, before collapsing on a sofa and declaring himself “dumb.” The hook for the film is curiosity: What happened to the horse in this tale? The answer to this question arrives during a remarkable one-and-a-half-minute shot in which we first zoom in to focus on the horse's face, and then zoom out as the stable door is shut forever. This shot begins as a dense moment of spectacle (in Ivakhiv's terms), creating an intense connection between viewer and animal. But the shot's length ensures that we realize that this is a real, fleshy horse, as well as a cipher for human–nonhuman entanglement. Tarr is famed for using nonactors in his films, and this horse is no exception. Tarr searched for a horse that didn't want to work, and found Ricsi in a “very ugly, shitty, miserable animal market” near the Romanian border (Tarr 2011a). The cinematographer, Fred Kelemen (2012), noted that “She had this deep sadness in her eyes.” As the horse stares at us through the camera, her eyes pull us in, asking for response. The horse, then, embodies both the characters’ and the viewers’ debts and obligations to nonhuman kin.∂ Although the horse suffers a hard life, it is far from being merely a dumb beast of burden that can only accede to human demands. For the horse betrays the man and daughter: She seems to sense the coming end better than the two humans. Crucially, it is when the horse refuses to eat that any possibility of escape for the humans is extinguished. For the horse cannot then drag their cart, and the daughter must try instead (either because the man is impaired or because of a gendered division of labor). She fails. The final terror here is not any historical calamity; the final terror is that the father and daughter are deserted by their nonhuman ally. The humans are left bereft, realizing too late that Tarr's injunction to go beyond mere survival to enhance the self, expand one's capacities, affirm dignity, and break out of the “law of rain and misery” requires, well, a horse—a significant earthly other (Rancière 2013, 46). The human characters in The Turin Horse are caught between, on one hand, the endless repetition of the same, and on the other hand the possibility of escape, of a line of flight that leads to another life, but that without the horse's help cannot be followed. This apocalyptic vision demonstrates the need for the contemporary human subject to become more actively aware of its debts to nonhumans and to enter into progressive alliances with nonhumans as partners, not mere victims to be saved.∂ If the anxieties of Anthropocene apocalypse in this film take shape through the geological and biological dimensions of life, these are in turn overshadowed by the film's peculiar temporality. Time is crucial to Tarr's film. The director is famed for long shots, and indeed there are only thirty cuts in the whole film. This warps the viewer's perception of time, demanding patience and a slower form of engagement that retrains perception and flirts with boredom (MacDonald 2004). As in other apocalyptic worlds, life in The Turin Horse is slow. This is a double juxtaposition: first to the snappy, energetic style of Hollywood disaster movies (a contemporary Hollywood film has a cut on average every four to six seconds), and second to the accelerated, globally networked world of the Anthropocene. In The Turin Horse there are two main temporalities at work. The first is the repetitive time of the everyday, which wears the characters down. The second is cosmic time, as the antigenesis narrative arc moves slowly to day seven and the end of everything. The film thus juxtaposes the embodied, lived experience of apocalypse against prophetic eschatology. Much as the Anthropocene names a disaster that has already occurred (Morton 2013), the cosmic temporality in The Turin Horse encompasses a slow unravelling after some undisclosed, past calamity. On one hand, this could be read as a postpolitical shrug, a deep cynicism about any creatures’ capacities to influence events and forces operating on vast scales (as the narrative of the film shows the wind, darkness, and end of fire overwhelming the characters, who remain unable to break of their repeated daily routines). This would be a circumscribed reading, though. The film does not encourage us to welcome the void. Rather, we want the characters, amid their geologic and biologic commitments, to act differently than they do in the film: to act, that is, despite the inevitability of the end by breaking out of their repetitive loops. In other words, if the creatures in The Turin Horse seem bent to their fate and the world's unravelling, their placidity makes us desire them to act otherwise. We want them to wake up, to assert their honor and dignity in the face of the wind and darkness. They do not, which challenges the audience to think about how they themselves might achieve a less fatalistic relation between the temporality of the everyday and the time of geologic inevitability. The film's ecology, in other words, overflows the film world into our own, and mirrors the predicament of the Anthropocene: Both asking how we should best respond to deep time and intractable Earth Forces (Clark 2014).∂ Conclusion∂ Tarr (2012) is convinced the world can be changed for the better, but confesses that he is “just a poor filmmaker,” who wants to “show you something, some pictures, just some human eyes, something that is close to you. … Just listen to your heart and trust your eyes. That's enough.” Tarr's film shows us characters downtrodden by forces vast and alien on the one hand (the wind and dark), intimate and fleshy on the other (unraveling bodies and animal agencies). The absence of the sun brings about the end of carbon modernity, their stockpile of oil useless and unburnable, and bereft of ideas the characters stumble to bed. An animal offers a line of escape from the encroaching gloom: an old horse that could, if it were able or wanted to, help the man and daughter escape. The horse shows the need for a desire that overflows the self and seeks connections, ways to feel more deeply our debts and obligations to nonhuman others. The Turin Horse is not a hopeful film. It shows the destruction of a version of the human that has been elevated into a planetary agent as the anthropos of the Anthropocene. The film enjoins us to imagine the characters doing things differently, breaking out of the law of rain and misery, **seeking alternatives to their repeated daily routines.∂** In this article I have been suggesting that apocalyptic cinema, with its portrayals of collapse and of what might come after, is a kind of ‘earth dreaming’ that constructs the Anthropocene (along with scientific measurement, carbon emissions, etc.). Such earth dreaming does not work the same way as other knowledge. It is more open, its test of verification is not the “transport of indisputable necessities,” but its capacity to create “beings of fiction” that are carried along and transformed by their dreaming (Latour 2013b, 112). We encounter cinema as an open ecology, a provocation to feel something different, and as a relativization of current political power; cinema does not instruct us with its knowledge claims, nor need it reinforce apathy, helplessness, and postpolitical impasse. I have stressed that, following the ecological model of Ivakhiv (2013), cinema works along spectacular, narrative, and exo-referential vectors that reconfigure the relation among audience, film, and world.∂ **We are not spectators of apocalypt**ic films, **we are participants**; their ecology is an invitation to feel the condition of the Anthropocene and what might lie beyond. If the earth-dreamers watching apocalyptic cinema are parochial, they are no less parochial than the legislators of sound science, the technocrats of earth systems governance, or the salespeople of shiny futures, and their version of the Anthropocene requires scrutiny in good faith, not just dismissal as vicarious indulgence or postpolitical passivity.**∂ Anthropocene apocalypse does not** therefore **demand action or politics in the traditional sense**. Instead, **apocalypse undercuts the familiar modern narrative of progress. It shows that our projected future will be rudely interrupted by more-than-human forces; that**, really, **our collective myth of progress, of a humanity reaching ever upward toward great feats of rational management, will collapse** as surely as global fish stocks. Thus the political charge of apocalypse is that it destroys the future—specifically, the future as a field in which the present human will endure unchanged. For some **this is liberating**: “Moderns always had a future … but never a chance, until recently that is, to turn to what I could call their prospect: the shape of things to come” (Latour 2010, 486). Or as Colebrook (2012) puts it, “**any truly futural future is apocalyptic, which is to say that it is destructive of the present, and certainly cannot be contained by any thought of saving, surviving, enduring, or maintaining life as cosmos or oikos**” (205). The dark geographies of apocalyptic life demand possibilities for other ways of being human, for a people to come after carbon humans. **Anthropocene apocalypse might not be** exactly **hopeful, but it demands a kind of depressing redemption: realizing that the question is not how to continue present ways of life, but the deeper challenge of crafting new ways to respond with honor and dignity to unruly earth forces.**

#### swyngedouw’s wrong – apocalypse rhetoric’s good – the alt fails

Clark 14

(Nigel, professor in the Lancaster Environment Center at Lancaster University (UK), “Geopolitics and the disaster of the Anthropocene”, Volume 62, Issue Supplement S1, pages 19–37, June 2014, dml)

Whether or not ‘apocalyptic’ imagery serves to promote or incapacitate politicization has long been debated in environmentalist circles and in critical social thought (**see Swyngedouw**, 2007; cf. Yusoff and Gabrys, 2011). In another register and another field, the question of whether ‘actual’ disasters provide opportunities for political transformation, or whether they are primarily occasions for the entrenchment of pre-existing power relations, has also been a matter of lively discussion (Cuny, 1983; Pelling and Dill, 2010; Kelman, 2012; Tironi, this volume). Whereas Naomi Klein's (2008) bestselling inquiry into the machinations of ‘disaster capitalism’ comes down firmly on the side of the latter, geographer Mark Pelling and anthropologist Kathleen Dill sift through a **range of case studies** to arrive, cautiously, at a **more hopeful prognosis**. ‘Disaster shocks’, they propose ‘**open political space** for the **contestation** or **concentration** of political power and the underlying distributions of rights between citizens and citizens and the state’ (2010: 34). Engaging in a more general sense with the political potential of the crisis or emergency, political theorist Bonnie Honig comes to a similar conclusion. Taking issue with the rush of recent critical work that characteristically equates the state of emergency with the suspension of civil liberties and the closure of political possibility, Honig argues for the fundamental ambivalence of invoking emergency, observing that no declaration of emergency can dictate how it will be received, interpreted and acted upon. In contrast to claims that the ‘emergency brings an end to real politics’, she seeks out and discovers **new possibilities** for **political renewal** and **change**: ‘hidden resources and alternative angles of vision that **might motivate action in concert** in emergency settings’ (2009: xv; see also Aradau and van Munster, 2011). But what might these political possibilities be? What is demanded of the political in the face of the threats and challenges designated by the Anthropocene? In the final section, I want to sketch out some of the ways that responses to the current geologic predicament of humankind are awakening to Michel Serres' call for a ‘geopolitics in the sense of the real Earth’ (1995: 44; see also Dalby, 2007). More than a matter of confronting the consequences of our own actions, I want to suggest, a growing conception of the inherent instability of the Earth is beginning to impact upon our understanding of the composition of the political; our sense of what it is we work with – or against – when we mobilize collectively. Towards an Anthropocene geopolitics Resonating with other researchers in the field of science and technology studies, Sheila Jasanoff writes of ‘the indeterminacy and complexity of many novel risks, and their refusal to stay within neatly drawn geopolitical lines’ (2010: 19; see also Petersen, this volume). It is timely, however, to ask what exactly the ‘geo’ in ‘geopolitical’ is doing in this scenario, and what claims about the coming of an Anthropocene epoch might mean for such an understanding of ‘geopolitical lines’. Perhaps the most crucial lesson of the Anthropocene is that the Earth itself must be understood as much more than a mere surface or stage on which political contests take place: it must acquire a volumetric or vertical dimension (Dalby, 2013; see also Elden, 2013). That is to say, the ‘geopolitical’ can no longer simply refer to a horizontal and synchronous globality. But this requires something more than extending the conventional concerns of geopolitical discourse and practice upwards into the atmosphere or downwards into the depths of the ocean or Earth. It requires us to bring politics into an intensive engagement with the planet's own dynamics: its processes of sedimentation and mobilization, its layering and folding, its periodicities and singularities. This means that the crucial borders or thresholds on the political agenda are not only those which divide nations or other socially inscribed territorial divisions of the Earth's surface, but also the spatio-temporal junctures at which one state or regime of an Earth system passes into another (Clark, 2011, see Weszkalnys, this volume on the Cenomanian Turonian extinction or boundary event). Or to put it another way, politics must expand its concerns with the shaping and reshaping of territory to embrace processes of stratification and destratification (see Deleuze and Guattari, 1987). When it comes to the threat of crossing boundaries or thresholds in Earth systems, as Johan Rockström and his interdisciplinary team observes: ‘[c]urrent governance and management paradigms are often oblivious to or lack a mandate to act upon these planetary risks’ (2009: unpag.).While the repeated failure of climate summits to achieve the binding commitments necessary to ward off ‘dangerous’ or ‘extremely dangerous’ climate change is the most conspicuous manifestation of this shortfall, the relative paucity of attention to other imminent or already-transgressed ‘planetary boundaries’ is no less revealing (Anderson and Bows, 2011; Rockström et al., 2009). Recent calls for what has been variously termed ‘planetary stewardship’ (Steffen et al., 2011); ‘Earth System governmentality’ (Lövbrand et al., 2009); and ‘global earth system governance’ (Dryzek and Stevenson, 2011: 1873) express a **growing recognition** of the need for new or greatly strengthened frameworks to meet the political challenge of maintaining Earth systems in socially desirable states. Needless to say, normative reasoning is **far from enough** to conjure such architectures into existence. Any conceivable success, political theorists John Dryzek and Hayley Stevenson remind us, must work **through** and **from existing experience** (2011: 1873). But what kinds of experience might be relevant here? We have seen that critical social thinkers can be as apprehensive about the successful operationalizing of strategies to ‘manage’ Earth systems as they are about inadequate planetary governance. While radical critics tend to champion a generalized advancement of democratic or deliberative political processes, they are often less than forthcoming about their own preferences for responding practically to the challenges posed by dynamic Earth or life processes. There are, of course, no easy answers to the question of how to gain experience of ‘governing’ the forces of the Earth. As Latour argues, novel situations configured by messy admixtures of social and material ingredients present a new imperative to improvise or experiment (see Farías, this volume). When it comes to situations with the scale and complexity of global climate change, however, he suggests we are way out of our depth: ‘The problem is that while we know how to conduct a scientific experiment in the narrow confines of a laboratory, we have no idea how to pursue collective experiments in the confusing atmosphere of a whole culture’ (Latour, 2003: 31). But who exactly the ‘we’ is in this statement raises questions of its own – inviting us to consider the historical and geographical depth of the human experience of living through environmental extremes. One of the motivations for thinking through geological durations, after all, is to contextualize the events of the present in a much broader framework. As philosopher-geologist Robert Frodeman explains, ‘[e]arthquakes, floods, hurricanes, and droughts are places where deep time erupts into more familiar temporal rhythms’ (2003: 125). If such threshold transitions or destratifications might be seen as ways in which the Earth experiments with its human (and non-human) inhabitants, they are equally occasions which oblige human populations to respond with experiments of their own. Many of those peoples who still live in relatively close proximity to the rhythms and upheavals of the Earth have learned how best to shelter from extreme events, when to move to safer ground, how to channel excess energies, what to cache or stockpile, and when to fight fire with fire (Clark, 2008; 2011). The shaping of such practices and the decisions out of which they are forged might well be seen as a form of geologic politics – though this is not necessarily ‘politics’ which is played out in the patient, deliberative manner that social theorists such as Latour or Ulrich Beck (1995) prefer (see Michael, this volume). As philosophers Gilles Deleuze and Felix Guattari (1987) suggest, our engagement with the organizational layerings and dynamics of our material worlds can be more than **reactive** or **defensive**. There is always the possibility of constructive traversals of compositional strata, of intercession in the flows of matter and energy, with no purpose other than **the joy of experimentation** and **the pleasure of creating new forms and structures**. At the same time, Deleuze and Guattari counsel about the dangers of ‘a too-sudden destratification’, warning that this ‘will sometimes end in **chaos**, the **void** and **destruction**, and sometimes lock us back into the strata’ (1987: 503). If this cautionary note applies in a general sense to the planetary predicament that results from unrestricted consumption of fossil fuels, so too is it apposite with regard to strategies for deliberate geotechnical interventions into Earth systems – not least the kind of unauthorized geoengineering experiment that recently took place off the Canadian coast (Geere, 2012). While geoengineering proposals have justifiably attracted critical scrutiny, they have in the process helped put practical experimentation with dynamic Earth processes more explicitly on the academic and the political agenda (see Galarraga and Szerszynski, 2012). Today, alongside speculative planet-scaled ‘smoke and mirrors’ geoengineering schemes (Humphreys, 2011), **a host of** **more moderately scaled** and **easily reversible strategies** for intervening in Earth systems are currently under experiment and review. These include localized alterations of the planet's albedo involving brightening of water and transformations of vegetative cover or the built environment, a range of forms of biological and geological carbon capture such as soil enhancement using charred organic matter, and a whole raft of proposals to protect and enhance ecosystems (Olson, 2012; see also Chris, 2013). Such strategies are of interest **not because they promise quick solutions** to climate change and other Earth system threshold problems, but because they give an idea of **the possible mix** of techno-physical and socio-political issues **that may characterize emergent ‘geo-political’ agendas**. They direct our attention not only to the kind of material interventions over which collective decisions must be made, but to the need for political constituencies to **consider their own everyday practical or material implication** in the dynamics of Earth systems – to ask how they themselves might take matter-energy flows into their own hands. And this implies that, just as critical social thinkers increasingly demand political awareness on the part of Earth systems scientists and engineers, so too must we **require** of ourselves a willingness to commit to some form of **experimental intervention in Earth processes** – with all the risks this inevitably entails.

## managerialism

### 2ac – at: k – managerialism

#### this begs the question of solvency – they have to beat the case to win any ‘turns case’ arguments – prefer the specificity of our evidence over their abstract theorizing

#### we don’t presuppose a precise climatic threshold – our solvency mechanism permits recursive updates in the rate of taxation based on most recent climate science – that’s aldy

#### our specific carbon tax proposal is a prerequisite to reshaping our political subjectivities – the alt is dangerous environmental managerialism

Dalby 15

Simon, Profess or Geography and Environmental Studies, Wilfrid Laurier University, 3/20/2015, Climate geopolitics: Securing the global economy, <http://link.springer.com/article/10.1057/ip.2015.3>

Dealing with humanitarian crises, especially in the Asia-Pacific theater, is a growing concern for Pentagon planners (Briggs, 2012), given the vulnerability of many island states to both rising sea levels and increased typhoon intensity. These events might cause political instabilities that generate conflict too. But in the case of many island states their inundation is a problem that needs urgent attention, and migration is going to continue to be necessary; this is an existential threat to island states but one that has not generated much international sympathy despite repeated calls to understand this as a security threat. This is a matter of survival for low lying atoll states, a new matter of ‘national’ security as states face the prospect of obliteration by rising sea water. If climate disruptions become severe and states and markets fail to adapt to new circumstances quickly enough, the prospect of geoengineering looms in the future, and with that potential future conflict too (Luke, 2010). Geoengineering refers to the deliberate manipulation of climate most obviously by techniques of ‘solar radiation management’ that adjust the amount of sunlight hitting the surface of the earth (Humphries, 2011). Reflecting it away by changing surface albedo, enhancing cloud formation to reflect light or adding sulfate aerosols to the upper atmosphere, effectively mimicking volcanoes, are all possibilities that are within the engineering capabilities of the larger states and some corporations already. While there are numerous schemes for space based sunshields and mirrors to reflect sunlight, such things remain science fiction. The practicalities of their deployment are so difficult that terrestrial projects for solar radiation management are the only possibilities that might be attempted in the foreseeable future (Hamilton, 2013). But these are attempts to engineer a solution that once again secures the capitalist order by further manipulating the environment, rather than facilitating social change that might produce less ecologically disruptive modes of human life. Such geoengineering speculation suggests very clearly that humanity has yet to come to terms with the consequences of the metabolic rift. Assumptions that humanity is separate from the earth, and that engineering can perpetuate this rift, as in seriously planning geoengineering programs, makes clear that the evacuation of the material context of humanity from thinking both in political economy and security studies needs to be tackled directly. Just how difficult this will be is apparent in Stiglitz and Kaldor’s (2013) recent efforts to formulate global security in terms that deal with both economy and military security. But clearly, to borrow Deudney’s (1999) terms, it is time to bring nature back into geopolitical thinking. Society, politics and economy framed in terms of nation states protecting carboniferous capitalism no longer provide the appropriate categories for thinking about security in a period of rapid environmental change (Dalby, 2009b). Climate change makes it abundantly clear that the metabolic rift has consequences; but which economic categories, and crucially which geopolitical categories are mobilized to frame policy options matters greatly. Much depends on whether state elites understand themselves as competing over a shrinking pool of resources or as collectively facilitating modes of production that replace fossil fueled capitalism quickly (Dalby, 2013). Failure to transform states so that they effectively deal with climate change may indeed turn new security issues back into traditional ones if states threatened by rapid environmental change and societal disruption attempt to resolve difficulties by using force. But the more immediately important policy implication from the analyses now circulated by the leading international financial institutions is that mitigation is essential to slow climate change to prevent drastic change that might undermine the stability of the global economy and with it human security in many forms (Potsdam Institute, 2012). But it is that economy that is causing climate change; so long-term security now means finding ways to change that economy rapidly. Moving quickly to decarbonize at least the North American economy, which is ought to be a global security priority given the high per-capita consumption of fossil fuels, obviously requires political innovation that somehow short-circuits the policy logjam in the present American Congress. Rapid decarbonization could become effective by a simple but dramatic innovation such as Hansen’s (2009) proposed fee and dividend approach to the fossil fuel industry. This suggests that fees would be charged directly on fossil fuel production to begin to make carbon fuels pay some of their environmental costs, and the proceeds sent directly to American citizens as bank deposits. This policy would provide all people in America with the cash to make appropriate changes to respond to rapidly rising energy prices. As Foster (2013) notes this would be a major policy initiative with valuable redistributive effects that could rapidly make capitalism much less fossil fuel dependent. Ironically it remains within the dominant neoliberal logic of market mechanisms, which would make it relatively easy to promote politically. It could work quickly. While Hansen’s scheme would not solve all the problems of the metabolic rift, it would, if adopted, begin to tackle one of its most dangerous consequences if not the larger pressing issue of formulating new political subjectivities less driven by market logics and status based consumption. However, despite American presidential rhetoric, and Obama’s ‘securitization’ of climate change there is no indication as of early 2014 that such initiatives will be launched. But the potential for drastic change is there. In Panitch and Gindin’s (2012) terms the possibilities of reworking the financial systems that now run the global economy into public utilities that facilitate the making of a more sustainable world are presented by current political movements, such as ‘Occupy’ and ‘Idle no More’, that have arisen to demand changes to the obviously unsustainable and unjust social order of contemporary capitalism. Whether states can innovate fast enough to quickly facilitate new energy systems and, in doing so, take the key insights of the new security agenda seriously enough to rework carboniferous capitalism into a more sustainable mode of political economy, or whether they will fall back on old technologies and older geopolitical understandings of a competitive world where self help may mean beggaring the rest, is now the key question for climate geopolitics. If security is to be rethought in terms of keeping the biosphere in conditions analogous to what humanity has so far experienced it is also clear that political economy scholars will have to reconsider material factors, and move well beyond being ‘the science of moving money’. In doing so they will also have to understand that where earlier versions of modern political and economic thought dealt with scarcity as the human condition, the problem with carboniferous capitalism is the opposite, a matter of the global over-abundance of fossil fuels.

## neoliberalism

### 2ac – at: sustainability

#### growth is infinitely sustainable – their arguments underestimate revolutions in efficiency and market-based incentives

Bourne 18

Ryan Bourne occupies the R Evan Scharf chair for the public understanding of economics at the Cato Institute. The Earth’s Resources Are Limited, but Human Ingenuity Is Infinite, https://www.cato.org/publications/commentary/earths-resources-are-limited-human-ingenuity-infinite, msm

This notion, that humans are like pigs eating from a finite trough, is intuitive. The Earth, logically, appears to have limited natural reserves. If one accepts this, it follows that bigger population or higher consumption levels will deplete the Earth’s riches. The implications are obvious: first, infinite growth is impossible due to these constraints on physical resources; second, to avoid the rapid depletion of the Earth’s resources, we must limit population growth, reduce consumption, or both. Such thinking is remarkably common among scientists. But it is uneconomic. What it ignores, as the great University of Maryland economist Julian Simon highlighted, is the capacity of human ingenuity to find new recipes and ideas. Anti-human thinkers fail to appreciate that our brains are also a resource. When toiling under the right institutions and market-based incentives — i.e. prices — we constantly dream up new ways of making or doing things, including new methods of discovery or means of excavating raw materials. Yes, consumption and population growth put pressure on resource availability. But markets provide us with incentives to change our behaviour or innovate. High prices caused by higher demand encourage us to shift to consuming substitutes in the short term. In the longer term they encourage us to seek out new supply or to rethink our whole approach. If this second effect dominates, the prices of natural resources could fall with population growth. More humans, after all, means a greater brain capacity for ideas to engender abundance. That is exactly what my Cato colleague Marian L Tupy, and Gale L Pooley of Brigham Young University, find in a fascinating new paper. The facts speak for themselves. Looking at a basket of 50 global commodities between 1980 and 2017, they find real prices fell by an average of 36pc. That happened despite the global population increasing by 69pc over the same period. A more accurate way to assess the “cost” to humans of these commodities is to calculate their “time price” — the amount of time an average human must work to earn enough to buy them. On that metric, the cost of these commodities fell much further — by a whopping 65pc. If it took 60 minutes of work to buy this basket in 1980, it only took 21 minutes of work to afford them in 2017. A continuation of that trend would see prices of these natural resources halve every 26 years. This utterly refutes the anti-human narrative and shows that Julian Simon was right. Population growth, far from exhausting resources, seems to be making them more plentiful. In fact, our current situation indicates a “super abundance”: prices (in terms of working time) are falling at a rate proportionally faster than the increase in population. How does this make sense, physically, on a planet of notionally fixed resources? Tupy and Pooley use a beautiful analogy. They state: “The world is a closed system in the way that a piano is a closed system. The instrument has only 88 notes, but those notes can be played in a nearly infinite variety of ways. The same applies to our planet. The Earth’s atoms may be fixed, but the possible combinations of those atoms are infinite. What matters, then, is not the physical limits of our planet, but human freedom to experiment and reimagine the use of resources that we have.” It is wrong, in other words, to think of human activity as a pure consumption of our physical inheritance. Our existence, provided we are governed by sound institutions, encourages new and innovative ways to fulfil wants and needs by combining and exploring the resources available to us. Earlier this year, for example, scientists discovered a 16m-ton patch of deep-sea mud rich with “rare earths” almost 800 miles off the coast of Japan. They estimate it could serve the planet’s need for those rare earths for between 400 and 800 years. The earth’s natural resources are neither fully known nor fixed in any meaningful sense. Neither, therefore, are the opportunities for growth. As former US president Ronald Reagan summarised succinctly: “There are no such things as limits to growth, because there are no limits to the human capacity for intelligence, imagination and wonder.” Provided we maintain sound economic policies, worrying about humans depleting resources amounts to unfounded hysteria.

#### err aff on empirics

Ormerod 15

(Paul, visiting professor at UCL Centre for Decision Making Uncertainty, British economist who is a partner at Volterra Partners consultancy, “Capitalism is stable and resilient,” <http://www.paulormerod.com/capitalism-is-stable-and-resilient/>)

The financial crisis did succeed in creating one dynamic new industry. Since the late 2000s, there has been a massive upsurge in op-ed pieces, books and even artistic performances offering a critique of capitalism. A founder member of the Monty Python team, Terry Jones, is the latest to get in on the act with his documentary Boom, Bust, Boom. The film makes use of puppetry and animation to argue that market-based economies are inherently unstable. In the opening scene, Jones appears on Wall Street. ‘This film is about the Achilles heel of capitalism’, the ex-Python solemnly proclaims, ‘how human nature drives the economy to crisis after crisis time and time again’. The intellectual underpinnings of the movie are the theories of the American economist Hyman Minsky. Minsky argued that a key mechanism that pushes an economy towards a crisis is the accumulation of debt by the private sector. Although he never constructed a formal model, Minsky’s ideas are clearly relevant to the run up to the crash in 2008. They at least deserve to be taken seriously. But does life really imitate art? Is capitalism genuinely unstable in the way in which Jones alleges in the film? An immediate problem for this view is that there have only been two global financial crashes in the past 150 years. The early 1930s and the late 2000s are the only periods in which these were experienced. So an event which takes place approximately once every 75 years is hardly convincing evidence with which to indict an entire system with the charge of instability. One way of looking at the stability of capitalism is through the labour market. If the system experiences frequent crises, the average rate of unemployment will be high. But this does not seem to be the case. From the end of the Second World War until the oil price crisis of the mid-1970s, unemployment averaged just under 5 per cent in America and was less than 3 per cent in the UK and Germany. Even during the more turbulent times since the 1970s, prior to the 2008/09 crisis, the unemployment rate averaged 6 – 7 per cent in the three economies. Higher, but by no means catastrophic given that Keynes himself thought it was very unlikely that the rate could be much less than 3 per cent over long periods of time. It could be argued that since 1945, the state has intervened much more in the economy, and it is this which has kept unemployment low. But over the 1870-1938 period, the numbers are very similar to those seen post-war. In the United States, it is 7 per cent, 5.5 per cent in Britain, and under 4 per cent in Germany. Most recessions are in fact very short lived. Since the late 19th century, 70 percent of all recessions lasted just a single year. The distinguishing feature of capitalism is not its instability, but its resilience. Markets are not perfect, but unemployment is usually low. Crises happen, but the system bounces back.

### 2ac – at: impact – environment

#### turn – tragedy of the commons – prefer empirical and statistical studies to rhetoric

Adler 12

Jonathan H. Adler is an American legal commentator and law professor at the Case Western Reserve University School of Law. Property Rights and Fishery Conservation, https://www.theatlantic.com/business/archive/2012/05/property-rights-and-fishery-conservation/257604/, msm

It does not have to be this way. Even before Hardin wrote his essay fishery economists had diagnosed the problem and explained how property rights in fisheries could solve the problem. Specifically by recognizing property rights in a percentage of the catch for a given species (or, in some cases, by recognizing rights in fishing territories), the "race to catch" could be eliminated and fishing crews could be given an incentive to husband the resource. The creation of property rights in the underlying resource aligns the incentives of those who work in the fishery with the health of the fishery. As owners of a share in the catch year-after-year, the fishers have a stake in ensuring there are more fish tomorrow than there are today. The benefits of such a system are not merely theoretical. They have now been confirmed through extensive empirical research. A recent study in Science that looked at over 11,000 fisheries over a fifty year period found clear evidence that the adoption of property-based management regimes, often called "catch shares" or ITQs, prevents fishery collapse. (More here.) This is only the latest piece of evidence supporting the use of property institutions for fishery conservation. As Hardin predicted, the institution of property rights averts the tragedy of the commons. There are many reasons for this. The creation of property rights in an ecological resource not only creates incentives for greater resource stewardship, to conserve the underlying value of the resource today and into the future. It also gives those who rely upon the resource a stake in the broader set of institutions that govern the resource. Under traditional fishery management, those who fish and those who regulate are typically at odds. Fishermen lobby for less restrictive catch limits so they may catch more today, out of fear the fishery may be more constrained tomorrow. Interestingly enough, the creation of property rights in the fishery catch encourages fishermen to take the opposite tack. More precautionary catch limits actually enhance the value of their catch shares, so they seek more protective policies. In some cases, as has been observed in New Zealand, fishery share owners themselves effectively take over the management of the stock, enforcing catch shares and limits, policing restrictions on by-catch, and funding the research necessary to ensure the fishery maintains its maximum sustainable yield over time.

#### cap solves their impact – the alt doesn’t

Bailey 19

Ronald, science correspondent at Reason, Capitalism Is the Key to Fixing Climate Change, https://reason.com/2019/09/20/capitalism-is-the-key-to-fixing-climate-change/, msm

Global warming is a classic example of what happens in an open-access commons. The atmosphere is unowned, so no one has an incentive to protect and conserve it. Instead, people overexploit and pollute it. Historically this happened with sulfur dioxide, carbon monoxide, and smoke. In the United States, cities initially implemented regulations to cut back on noxious air pollutants. (For example, the first smoke abatement regulations were enacted by Chicago and Cincinnati in 1881.) Eventually federal regulations and market mechanisms were adopted. As a result, since 1980 air pollutants have collectively declined by 68 percent while the economy grew by 175 percent. Scientists call this the environmental Kuznets curve. Environmental commons tend to deteriorate as countries begin to develop economically—but once per-capita income reaches a certain level, the public starts to demand a cleanup. It's a U-shaped pattern: Economic growth initially hurts the environment, but after a point it makes things cleaner. By then, slowing or stopping economic growth will delay environmental improvement, including efforts to mitigate the problem of man-made global warming. The MIT economist Andrew McAfee explains the process in a forthcoming book, More from Less: We have finally learned how to tread more lightly on our planet….In America—a large rich country that accounts for about 25 percent of the global economy—we're now generally using less for most resources year after year, even as our economy and population continue to grow. What's more, we're also polluting the air and water less, emitting fewer greenhouse gases, and seeing population increases in many animals that had almost vanished. America, in short, is post-peak in its exploitation of the earth. The situation is similar in many other rich countries, and even developing countries such as China are now taking better care of the planet in important ways. How did this happen? Through more capitalism, not less: The strangest aspect of the story is that we didn't make any radical course changes to eliminate the trade-off between human prosperity and planetary health. Instead, we just got a lot better at doing things we'd already been doing. In particular, we got better at combining technological progress with capitalism to satisfy human wants and needs. McAfee's book documents how technological progress spurred by market competition is dematerializing the economy. McAfee makes a strong case that climate change is an open-access commons problem that markets can dematerialize once a price is put on greenhouse gas emissions. The upshot is that Klein, The Guardian, and many of the climate strikers have it exactly backwards. Properly incentivized capitalism is the key to solving the problems caused by climate change.

### 2ac – at: impact – root cause

#### robust statistical evidence disproves their vacuous impact claims

Iacono 5-13-16

Corey Iacono is a student at the University of Rhode Island majoring in pharmaceutical science and minoring in economics. Neoliberalism: the Left’s Eternal Boogeyman, https://fee.org/articles/neoliberalism-the-left-s-eternal-boogeyman/, msm

In a recent article published by the Guardian, George Monbiot claims that the political philosophy of economists F.A. Hayek and Milton Friedman — what he pejoratively calls “neoliberalism” — is “at the root of all our problems.” Monbiot notes correctly that liberal economists are generally in favor of free markets and minimal government intervention in the economy. However, he also makes some rather weird claims that make you wonder if he has actually read people whose ideas he’s criticizing. For example, he claims that “neoliberals” like Hayek and Friedman believe that “inequality is … virtuous: a reward for utility and a generator of wealth, which trickles down to enrich everyone. Efforts to create a more equal society are both counterproductive and morally corrosive.” This is misleading. In Capitalism and Freedom (1962), Milton Friedman wrote that “special monopoly privileges granted by government, tariffs, and other legal enactments benefiting particular groups, are a source of inequality. The removal of these, the liberal will welcome.” He also wrote, “The extension and widening of educational opportunities has been a major factor tending to reduce inequalities. Measures such as these have the operational virtue that they strike at the sources of inequality rather than simply alleviating the symptoms.” F.A. Hayek similarly wrote in The Road to Serfdom (1944) that there is a “strong case for reducing inequality of opportunity as far as congenital differences permit and as it is possible to do so without destroying the impersonal character of the process by which everybody has to take his chance and no person's view about what is right and desirable overrules that of others.” “Neo” — really, classical — liberals do not celebrate inequality as “virtuous” and inherently good. They prefer to reduce some sources of inequality by expanding economic opportunity and removing legal privileges and monopolies that benefit the few at the expense of the many. On the other hand, the principle means by which the left wishes to reduce inequality is through progressive taxation and wealth redistribution, which classical liberals generally oppose, on the grounds that, as Friedman put it, “using coercion to take from some in order to give to others … conflicts head-on with individual freedom.” Perhaps Monbiot has mistaken classical liberal hesitation to support coercive redistribution with opposition to a more equal society per se. He claims “neoliberals” believe “the market ensures that everyone gets what they deserve,” and “If you don’t have a job it’s because you are unenterprising… If your credit card is maxed out, you’re feckless and improvident… If your children no longer have a school playing field: if they get fat, it’s your fault.” From where exactly did he conjure this impression? It certainly wasn’t from anything Hayek or Friedman actually wrote. In The Road to Serfdom, Hayek argued that a person’s success in the market economy “depends at least partly on the ability and enterprise of the people concerned and partly on unforeseeable circumstances,” and that “in a competitive society it is no slight to a person, no offence to his dignity, to be told by any particular firm that it has no need for his services, or that it cannot offer him a better job.” If Friedman and Hayek believed that the market always ensured that people got what they “deserved,” why did they also support measures “supplementary to the market system” to provide universal guarantees of economic security? In The Road to Serfdom, Hayek bluntly stated, In a society that has reached the general level of wealth which ours has attained … some minimum of food, shelter and clothing, sufficient to preserve health and the capacity to work, can be assured to everybody. Nor is there any reason why the state should not assist the individuals in providing for those common hazards of life against which, because of their uncertainty, few individuals can make adequate provision. Similarly, in a 1951 article, Milton Friedman wrote, “Our humanitarian sentiments demand that some provision should be made for those who draw blanks in the lottery of life,” and “there is justification in trying to achieve a minimum income for all.” In Capitalism and Freedom, he proposed a negative income tax as a means to achieve that goal. Monbiot really should have known this, since he links to this very article in his own piece. Nonetheless, Monbiot proclaims, “As it evolved, neoliberalism became more strident. Hayek’s view that governments should regulate competition to prevent monopolies from forming gave way — among American apostles such as Milton Friedman — to the belief that monopoly power could be seen as a reward for efficiency.” But in the 1951 article cited by Monbiot, Friedman wrote that advocates of laissez-faire had “underestimated the danger that private individuals could, through agreement and combination, usurp power and effectively limit the freedom of other individuals,” and that he personally believed that it was the state’s role to “establish conditions favorable to competition and prevent monopoly.” After misrepresenting the views and philosophy of Hayek and Friedman, he then absurdly attempts to tie “neoliberalism” to fascism, totalitarianism, and political violence. He approvingly cites Naomi Klein’s debunked assertions that free market reforms are so unpopular they have to be forced upon people by violent dictators — apparently unaware of research published in the American Economics Journal that found democracies are much more likely to undergo economic liberalization than non-democracies. Research by economists Indra de Soysa and Krishna Chaitanya Vadlammanati also concludes that “using the best available data and empirical methods, we find positive effects of market-economic policy reforms on government respect for human rights,” and their results “vindicate those who find positive effects of free markets on economic development and other measures of social welfare.” Klein and Monbiot are also apparently unaware (or unwilling to admit) that the supposedly “socialist” Scandinavian countries they fancy are actually “among the frontrunners in liberalization” — at least according to actual economists in Scandinavia. Sweden, for example, adopted a successful universal school choice system in the 1990s that is nearly identical to the system proposed by Milton Friedman his classic 1955 essay “The Role of Government in Education.” Monbiot then attempts to link “neoliberalism” to fascism by blaming it for the rise of Donald Trump, because “neoliberals” in the political establishment have supposedly alienated voters and sent them into the arms of demagogues like Trump, who will then push the political system towards fascism. There is no evidence for any of this. Hayek and Friedman are certainly not the guiding lights of today's Republican or Democratic political establishments, and it's laughable to argue that Trump supporters are upset by some nonexistent wave of “neoliberal” deregulation. Monbiot also fails to note that the populist backlash driving Trump's campaign is the same fuel propelling the rise of Bernie Sanders. Are Hayek and Friedman to blame for every contemporary populist uprising? Of course not. The great classical liberal economists of the 20th century provided an ethical, nuanced, and empirically rigorous defense of free market capitalism at a time when central planning and totalitarian ideologies were sweeping the globe. Liberals in the West owe them a huge debt, but unfortunately, they are defaulting on their obligation.

### 2ac – at: impact – structural violence

#### productivity has been phenomenal for global quality of life and reducing structural violence – their authors are reductionist

Iacono 1-16-16

Corey, student at the University of Rhode Island studying Pharmaceutical Science and Economics, How Capitalism and Globalization Have Made the World a Better Place, http://quillette.com/2016/01/16/how-capitalism-and-globalization-have-made-the-world-a-better-place/, msm

Just kidding, that’s not what happened at all. In fact, as the world has become more capitalist and more globalized, the quality of life for the average person, and especially for the average poor person, has increased substantially. In 1990, 37% of the global population lived on less than $1.90 per day. By 2012, that number had been reduced to 12.8%, and in 2015 it was under 10%. The source of this progress isn’t a massive wealth redistribution program; it’s massive wealth creation — that is, economic growth. Economists David Dollar and Aart Kraay found that, in a global sample of over 100 countries, changes in the income growth of the bottom 40% of the world’s income earners are highly correlated with economic growth rates. On the other hand, changes in inequality contributed relatively little to changes in social welfare of the poor over the last few decades. There is good reason to believe that the expansion of free trade, facilitated by international organizations like the World Trade Organization (WTO) and its predecessor, the General Agreement on Tariffs and Trade (GATT), have had a considerable impact in accelerating the economic development of developing countries. In the 1990s GATT facilitated reforms which moved 125 countries towards freer trade by reducing the burden of government imposed trade barriers like tariffs. This was the first serious attempt at trade reform for most developing countries at the time, and arguably presents a unique natural experiment on the economic effects of trade reform. In fact, a paper published by the National Bureau of Economic Research (NBER), specifically examined how trade reforms facilitated by GATT affected the economic development of the reforming countries. In the paper, the authors compared the trends in economic growth before and after trade reform in the reforming countries. Then they compared those results to trends in economic growth of a control group of countries which didn’t undergo trade reform. What they found was very encouraging for proponents of free trade. Prior to reform, the economic development of reformers and non-reformers was practically identical, but after reform, the economic development of reforming countries accelerated while non-reforming countries saw their economies stagnate and decline. The results suggest that the reforms towards freer trade lead to an increase in income per capita of around 20% in the long-run, an effect so large that it almost certainly had a positive and non-trivial impact on poverty reduction. Similarly, other research has shown that more free market trade policies result in lower rates of extreme poverty and child mortality in developing countries. There are other benefits as well. One study on trade reform in Indonesia found that reductions of import tariffs led to an increase in disposable income among poor households, which allowed them to pull their children out of the labor force, leading to “a strong decline” in the incidence of child labor. Unfortunately, many activists have reflexively taken up the cause of opposing the expansion of global capitalism, for a number of reasons. Western anti-sweatshop activists, for example, will often argue in favor of government imposed barriers to trade with poor countries because their working conditions are terrible in comparison to those in developed Western nations. In their view, western consumers should not be promoting a cycle of capitalist exploitation by buying products made in Vietnamese sweat-shops. But satisfactory working conditions aren’t the natural state of mankind; they are a consequence of decades of economic development. Erecting barriers to trade with poor countries is surely a large impediment to their development, in fact, research suggests that existing developed world tariffs depress economic growth rates in the developing world by 0.6 to 1.6 percent per person, a considerably large effect. Moreover, the sweat-shops which produce clothing for Westerners are often much better than alternative forms of domestic employment. In poor countries like Bangladesh, China, and Vietnam, the apparel industry consistently pays more than most other domestic industries. According to research by economist Ben Powell, in poor countries “most sweatshop jobs provide an above average standard of living for their workers.” Notably, a paper published in the Journal of Development Economics found that the expansion of the garments industry in Bangladesh lead to an increase in employment and income among young women, giving them the means to finance their own education. Remarkably the authors found that, “the demand for education generated through manufacturing growth appears to have a much larger effect on female educational attainment compared to a large-scale government conditional cash transfer program to encourage female schooling.” Foreign investment is also more desirable than opponents of capitalism and globalization give it credit for. The conventional wisdom among activists in wealthy countries is that multinational corporations exploit poor workers in third world countries for cheap labor, profiting off people working in sweatshop conditions. It should come as a surprise to the individuals who hold this view to learn that 85% of people in developing countries believe that foreign companies building factories in their countries is a good thing, according to Pew Research. In fact, for all the talk of exploitative multinational corporations, research shows that, in general, these corporations provide higher wages and better working conditions than domestic employers in developing countries. Additionally, when multinational corporations build factories in poor countries, it raises the demand for low-skilled workers, resulting in higher wages for local workers. Consistent with this fact, recent empirical evidence demonstrates that investment by foreign companies in developing countries reduces both poverty and income inequality by raising the incomes of low-skilled workers. Foreign investment can also make people in relatively low-income countries better off by providing better or more inexpensive products. A recent analysis published by the NBER found that foreign retailers like Wal-Mart greatly reduce the cost of living for both the rich and poor in Mexico, making everyone along the income distribution better off. Global capitalism is by no means a perfect phenomenon. Many businesses do have questionable labor practices that are worthy of contempt. And free market policies may in many instances lead to socially undesirable outcomes, sometimes on a large scale. However, the one-dimensional, automatic denunciation of capitalism and the accompanying refusal to give it any credit for its successes — as social media activists have done — reflects an uncompromising, and quite frankly ignorant worldview. It is one in which capitalism is always bad, no matter what the evidence tells us.

### 2ac – impact turn – disease

#### capitalism’s key to solve disease

Norberg '03

((Johan, Fellow @ Timbro, In Defense Of Global Capitalism, p. 186)

One common objection to the market economy is that it causes people and enterprises to produce for profit, not for needs. This means, for example, pharmaceutical companies devoting huge resources to research and medicines to do with obesity, baldness, and depression, things that westerners can afford to worry about and pay for, whereas only a fraction is devoted to attempting to cure tropical diseases afflicting the poorest of the world's inhabitants, such as malaria and tuberculosis. This criticism is understandable. The unfairness exists, but capitalism is not to blame for it. Without capitalism and the lure of profit, we shouldn't imagine that everyone would have obtained cures for their illnesses. In fact, far fewer would do so than is now the case. If wealthy people in the West demand help for their problems, their resources can be used to research and eventually solve those problems, which are not necessarily trivial to the people afflicted with them. Capitalism gives companies economic incentives to help us by developing medicines and vaccines. That westerners spend money this way does not make things worse for anyone. This is not money that would otherwise have gone to researching tropical diseases—the pharmaceutical companies simply would not have had these resources otherwise. And, as free trade and the market economy promote greater prosperity in poorer countries, their needs and desires will play a larger role in dictating the purposes of research and production.

#### extinction – burnout wrong

Kerscher 14—Professor, unclear where because every website about him is in German

(Karl-Heinz, “Space Education”, Wissenschaftliche Studie, 2014, 92 Seiten)

The death toll for a pandemic is equal to the virulence, the deadliness of the pathogen or pathogens, multiplied by the number of people eventually infected. It has been hypothesized that there is an upper limit to the virulence of naturally evolved pathogens. This is because a pathogen that quickly kills its hosts might not have enough time to spread to new ones, while one that kills its hosts more slowly or not at all will allow carriers more time to spread the infection, and thus likely out-compete a more lethal species or strain. This simple model predicts that if virulence and transmission are not linked in any way, pathogens will evolve towards low virulence and rapid transmission. However, this assumption is not always valid and in more complex models, where the level of virulence and the rate of transmission are related, high levels of virulence can evolve. The level of virulence that is possible is instead limited by the existence of complex populations of hosts, with different susceptibilities to infection, or by some hosts being geographically isolated. The size of the host population and competition between different strains of pathogens can also alter virulence. There are numerous historical examples of pandemics that have had a devastating effect on a large number of people, which makes the possibility of global pandemic a realistic threat to human civilization.

### 2ac – impact turn – space

#### profit maximization is key to space colonization – governmental institutions are insufficient

Spring 6-3-16

Todd, A Case for Capitalism, In Regards to Space Travel, https://thepolicy.us/a-case-for-capitalism-in-regards-to-space-travel-d77e50f8116e#.wnmdm7q7x, msm

For years, we have been waiting for N.A.S.A. (or some other government-funded agency) to begin pulling up their breeches when it comes to the manned exploration of our solar system…but thus far they have not been able to get their act together. We have waited and waited, but as of yet nothing has come to pass but brief mention of such travels here and there…like a wind with neither haste nor purpose. As of now, N.A.S.A. does not plan on sending a manned mission to Mars until the 2030s — assuming, of course, they get the government funding they need to undertake such a massive project. Considering the recent cuts to deep space exploration, down nearly $300 million from 2016, I am not certain what the condition of the program will look like in another two years…much less the gap between now and the 2030s. Where, then — if the government and its agencies will not provide us with the money for exploration — will we turn to slake our thirst for cosmic space travel? SpaceX. Private corporations. Capitalism. Seeing this article in the news, reading day after day the story of budget cuts to N.A.S.A. in regards to deep-space exploration and other related programs, got me thinking about just how important it will be for private companies and corporations to undertake these projects…such as Elon Musk’s SpaceX, and countless others (read the full list here). The problem is that we have gotten it into our heads that Capitalism is the root cause of our economic woes in the United States, perhaps failing to understand that such policies are something like a double-edged sword: they could also be our salvation. This article provides a great list of the pro’s and con’s of Capitalism. I would recommend you take the short passing of time it requires to read it through-and-through before continuing. Now then. I have never been for for fully-unhindered Capitalism. I do not believe that the government should stay out of economic affairs entirely, for as provided in the article many of the con’s relate to improper regulation (monopolization) as opposed to something fundamentally wrong, but I do not believe that any government should be going about shoving their claws into every economic affair either. There must be a healthy balance, especially if Capitalism is to work as it is supposed to work. The same goes for any policy. The government should be there to bolster competition between businesses…not favor one or bail-out the other. The more regulation, the more interference or amendment, the less it works…but this mix of regulation and free market must fall in the “goldilocks zone” if the citizens of said society are to reap its full benefit. If not, like planets about a star, the society shall either burn or freeze. One of those benefits is highlighted by Elon Musk’s SpaceX: the intervention of privately-funded companies to do things that a traditional government agency cannot. Namely, the exploration and eventual colonization of Mars in a reasonable, step-by-step timeframe…unlike the “we will get to it eventually” mindset plaguing the bowels of the United States government. Were not the policies in place to foster the growth of private companies, our best chance at getting people out of Earth-orbit — the Bush-approved, now-cancelled, insanely-expensive Constellation program — would have gone the way of promises and well-wishes. It is my hope that Elon Musk and space entrepreneurs like him are not simply blowing steam, and that one day — perhaps even within my lifetime — I could be on my way to a space hotel on the Moon, flying aboard a space airliner with the name of a private company plastered across the side. Regardless, if we humans are to truly become a multi-planet species we must not hinder economic growth with narrow thoughts. We must not become confused that the “problems down here” and the “problem of getting out there” must be in conflict; they do not need to, and we must not suppose they should. They are two separate issues with two unique sets of problems, and thus this policy of taking resources from one to give to the other will only ensure that neither issue is given that which it needs, or enough to fix what must be solved. Therefore I propose that we support these pioneers of space travel in any way that we are able. Let us not forget that solving the issue of “how do we get there” might just lead to the end of our “problems down here”.

#### extinction’s inevitable – have to get off the rock

Welsh 12-16-13

Ian, chief executive, Health and Social Care Alliance Scotland, Extinction is Guaranteed if We Do Not Colonize Space, http://www.ianwelsh.net/extinction-is-guaranteed-if-we-do-not-colonize-space/, msm

The Earth is a dangerous place, and humans make it more so. There are many scenarios, from nuclear war, to designer diseases, to nanotech goo, too environmental catastrophe where we can wipe ourselves out. Further, there are events almost entirely beyond our control, like meteor impacts, which could wipe us out. The Earth is a mass-graveyard: most species which have ever existed are extinct. The Earth is a single point of failure. If all self-sustainable human breeding populations are on Earth, we are much more likely to go extinct, and far sooner. Getting of the rock is about human survivability in the longer run. Getting out into the solar system, learning how to create habitats and breeding populations, increases our viability. Spreading to other solar systems, whenever we can, will increase it even further. On the other hand, if we stay on Earth, especially given how incapable we are of acting in basic racial self-interest (as proved by climate change) our odds of an extinction event, and soon, go way, way up.

### 2ac – impact turn – war

#### Capitalism solves war on a massive scale – it creates lock-in mechanisms that bind countries together and economically dampens conflict – robust studies

Dafoe & Kelsey 14

Political Science and International Economics, ’14 (Allan & Nina; assistant professor in political science at Yale & research associate in international economics at Berkeley; Journal of Peace Research, “Observing the capitalist peace: Examining market-mediated signaling and other mechanisms,” <http://jpr.sagepub.com.proxy.lib.umich.edu/content/51/5/619.full>)

Countries with liberal political and economic systems rarely use military force against each other. This anomalous peace has been most prominently attributed to the ‘democratic peace’ – the apparent tendency for democratic countries to avoid militarized conflict with each other (Maoz & Russett, 1993; Ray, 1995; Dafoe, Oneal & Russett, 2013).More recently, however, scholars have proposed that the liberal peace could be partly (Russett & Oneal, 2001) or primarily (Gartzke, 2007; but see Dafoe, 2011) attributed to liberal economic factors, such as commercial and financial interdependence. In particular, Erik Gartzke, Quan Li & Charles Boehmer (2001), henceforth referred to as GLB, have demonstrated that measures of capital openness have a substantial and statistically significant association with peaceful dyadic relations. Gartzke (2007) confirms that this association is robust to a large variety of model specifications. To explain this correlation, GLB propose that countries with open capital markets are more able to credibly signal their resolve through the bearing of greater economic costs prior to the outbreak of militarized conflict. This explanation is novel and plausible, and resonates with the rationalist view of asymmetric information as a cause of conflict (Fearon, 1995). Moreover, it implies clear testable predictions on evidential domains different from those examined by GLB. In this article we exploit this opportunity by constructing a confirmatory test of GLB’s theory of market-mediated signaling. We first develop an innovative quantitative case selection technique to identify crucial cases where the mechanism of market-mediated signaling should be most easily observed. Specifically, we employ quantitative data and the statistical models used to support the theory we are probing to create an impartial and transparentmeans of selecting cases in which the theory – as specified by the theory’s creators –makes its most confident predictions.We implement three different case selection rules to select cases that optimize on two criteria: (1) maximizing the inferential leverage of our cases, and (2) minimizing selection bias. We examine these cases for a necessary implication of market-mediated signaling: that key participants drew a connection between conflictual events and adverse market movements. Such an inference is a necessary step in the process by which market-mediated costs can signal resolve. For evidence of this we examine news media, government documents, memoirs, historical works, and other sources. We additionally examine other sources, such as market data, for evidence that economic costs were caused by escalatory events. Based on this analysis, we assess the evidence for GLB’s theory of market mediated costly signaling. Our article then considers a more complex heterogeneous effects version of market-mediated signaling in which unspecified scope conditions are required for the mechanism to operate. Our design has the feature of selecting cases in which scope conditions are most likely to be absent. This allows us to perform an exploratory analysis of these cases, looking for possible scope conditions. We also consider alternative potential mechanisms. Our cases are reviewed in more detail in the online appendix.1 To summarize our results, our confirmatory test finds that while market-mediated signaling may be operative in the most serious disputes, it was largely absent in the less serious disputes that characterize most of the sample of militarized interstate disputes (MIDs). This suggests either that other mechanisms account for the correlation between capital openness and peace, or that the scope conditions for market-mediated signaling are restrictive. Of the signals that we observed, strategic market-mediated signals were relatively more important than automatic market-mediated signals in the most serious conflicts. We identify a number of potential scope conditions, such as that (1) the conflict must be driven by bargaining failure arising from uncertainty and (2) the economic costs need to escalate gradually and need to be substantial, but less than the expected military costs of conflict. Finally, there were a number of other explanations that seemed present in the cases we examined and could account for the capitalist peace: capital openness is associated with greater anticipated economic costs of conflict; capital openness leads third parties to have a greater stake in the conflict and therefore be more willing to intervene; a dyadic acceptance of the status quo could promote both peace and capital openness; and countries seeking to institutionalize a regional peace might instrumentally harness the pacifying effects of liberal markets. The correlation: Open capital markets and peace The empirical puzzle at the core of this article is the significant and robust correlation noted by GLB between high levels of capital openness in both members of a dyad and the infrequent incidence of militarized interstate disputes (MIDs) and wars between the members of this dyad (Gartzke, Li & Boehmer, 2001). The index of capital openness (CAPOPEN) is intended to capture the ‘difficulty states face in seeking to impose restrictions on capital flows (the degree of lost policy autonomy due to globalization)’ (Gartzke & Li, 2003: 575). CAPOPEN is constructed from data drawn from the widely used IMF’s Annual Reports on Exchange Arrangements and Exchange Controls; it is a combination of eight binary variables that measure different types of government restrictions on capital and currency flow (Gartzke, Li & Boehmer, 2001: 407). The measure of CAPOPEN starts in 1966 and is defined for many countries (increasingly more over time). Most of the countries that do not have a measure of CAPOPEN are communist.2 GLB implement this variable in a dyadic framework by creating a new variable, CAPOPENL, which is the smaller of the two dyadic values of CAPOPEN. This operationalization is sometimes referred to as the ‘weak-link’ specification since the functional form is consonant with a model of war in which the ‘weakest link’ in a dyad determines the probability of war. CAPOPENL has a negative monotonic association with the incidence of MIDs, fatal MIDs, and wars (see Figure 1).3 The strength of the estimated empirical association between peace and CAPOPENL, using a modified version of the dataset and model from Gartzke (2007), is comparable to that between peace and, respectively, joint democracy, log of distance, or the GDP of a contiguous dyad (Gartzke, 2007: 179; Gartzke, Li & Boehmer, 2001: 412). In summary, CAPOPENL seems to be an important and robust correlate of peace. The question of why specifically this correlation exists, however, remains to be answered. The mechanism: Market-mediated signaling? Gartzke, Li & Boehmer (2001) argue that the classic liberal account for the pacific effect of economic interdependence – that interdependence increases the expected costs of war – is not consistent with the bargaining theory of war (see also Morrow, 1999). GLB argue that ‘conventional descriptions of interdependence see war as less likely because states face additional opportunity costs for fighting. The problem with such an account is that it ignores incentives to capitalize on an opponent’s reticence to fight’ (Gartzke, Li & Boehmer, 2001: 400.)4 Instead, GLB (see also Gartzke, 2003; Gartzke & Li, 2003) argue that financial interdependence could promote peace by facilitating the sending of costly signals. As the probability of militarized conflict increases, states incur a variety of automatic and strategically imposed economic costs as a consequence of escalation toward conflict. Those states that persist in a dispute despite these costs will reveal their willingness to tolerate them, and hence signal resolve. The greater the degree of economic interdependence, the more a resolved country could demonstrate its willingness to suffer costs ex ante to militarized conflict. Gartzke, Li & Boehmer’s mechanism implies a commonly perceived costly signal before militarized conflict breaks out or escalates: if market-mediated signaling is to account for the correlation between CAPOPENL and the absence of MIDs, then visible market-mediated costs should occur prior to or during periods of real or potential conflict (Gartzke, Li & Boehmer, 2001). Thus, the proposed mechanism should leave many visible footprints in the historical record. This theory predicts that these visible signals must arise in any escalating conflict, involving countries with high capital openness, in which this mechanism is operative Clarifying the signaling mechanism Gartzke, Li & Boehmer’s signaling mechanism is mostly conceptualized on an abstract, game-theoretic level (Gartzke, Li & Boehmer, 2001). In order to elucidate the types of observations that could inform this theory’s validity, we discuss with greater specificity the possible ways in which such signaling might occur. A conceptual classification of costly signals The term signaling connotes an intentional communicative act by one party directed towards another. Because the term signaling thus suggests a willful act, and a signal of resolve is only credible if it is costly, scholars have sometimes concluded that states involved in bargaining under incomplete information could advance their interests by imposing costs on themselves and thereby signaling their resolve (e.g. Lektzian & Sprecher, 2007). However, the game-theoretic concept of signaling refers more generally to any situation in which an actor’s behavior reveals information about her private information. In fact, states frequently adopt sanctions with low costs to themselves and high costs to their rivals because doing so is often a rational bargaining tactic on other grounds: they are trying to coerce their rival to concede the issue. Bargaining encounters of this type can be conceptualized as a type of war-of-attrition game in which each actor attempts to coerce the other through the imposition of escalating costs. Such encounters also provide the opportunity for signaling: when states resist the costs imposed by their rivals, they ‘signal’ their resolve. If at some point one party perceives the conflict to have become too costly and steps back, that party ‘signals’ a lack of resolve. Thus, this kind of signaling arises as a by-product of another’s coercive attempts. In other words, costly signals come in two forms: self-inflicted (information about a leader arising from a leader’s intentional or incidental infliction of costs on himself) or imposed (information about a leader that arises from a leader’s response to a rival’s imposition of costs). Additionally, costs may arise as an automatic byproduct of escalation towards military conflict or may be a tool of statecraft that is strategically employed during a conflict. The automatic mechanism stipulates that as the probability of conflict increases, various economic assets will lose value due to the risk of conflict and investor flight. However, the occurrence of these costs may also be intentional outcomes of specific escalatory decisions of the states, as in the case of deliberate sanctions; in this case they are strategic. Finally, at a practical level, we identify three different potential kinds of economic costs of militarized conflict that may be mediated by open capital markets: capital costs from political risk, monetary coercion, and business sanctions. T

# cp

## theory

### 2ac – condo

**conditionality is a voting issue – dispo solves their offense**

**a – strat skew – they can cross apply contradictory answers to each flow – makes it impossible to generate our offense and favors the neg by causing us to debate ourselves**

**b – cost-benefit analysis – they go for what’s covered the least, which doesn’t test the quality of advocacies – tanks argument responsibility because they can kick what we have offense on**

### 2ac – process

**counterplans that result in the aff are a voting issue and a justification for perm do the cp –**

**a – fairness – dozens of processes the aff could fiat – they explode the aff research burden and sideline the substance of the 1ac**

**b – education – doesn’t test the substance of the 1ac since it’s not an opportunity cost to the endpoint of the plan – rather – has us test trivial net benefits – not useful education since citizens only control the substance of policy, not the processes of implementation**

**our c/i. is that we will defend certainty and immediacy for da’s not counterplans – solves all their offense**

### 2ac – states

**states cp’s are a voting issue –**

**a – no predictable literature base – they artificially fiat the uniformity of the cp – it’s not precedented in the literature which makes researching solvency deficits impossible**

**b – education – doesn’t test the substance of the aff – no comparative articles are written between benefits of federal and coordinated state action on an issue – cp doesn’t test a real-world controversy**

**our c/i is they get the cp if they have a solvency advocate about our aff**

## advantage – warming

### 2ac – at: cp – cap’n’trade

#### perm – do both

#### cap-and-trade can’t solve the aff – multiple warrants

Kerr 10

Alex Rice, J.D. from the University of Colorado School of Law, “Why We Need a Carbon Tax,” University of California—Davis, <http://environs.law.ucdavis.edu/volu> mes/34/1/kerr.pdf, Date Accessed: 7-21-16

Each argument for cap-and-trade can be met with compelling counterarguments. Many supporters subscribe to a theory called “benefit certainty”. This theory assumes that scientific inquiry can ascertain the correct level of carbon emissions. However, scientists may not, in reality, be able to determine the “correct” level of carbon emissions. In the vastness of our complicated ecosystem, such a standard may be beyond our current or ultimate scientific comprehension. Even if such an answer were determinable, political compromise will likely affect the process of reaching such a conclusion. Limiting emissions directly impacts human activity and negotiating emission rates will be an unavoidably politicized process. Various allowances and compromises necessary to push through such overarching legislation will invariably compromise a rigid scientific effort. Lastly, once a cap is in place, it will be difficult to change. Reliable, built-in mechanisms to adjust the system according to new experiences should be in place in undertaking such a massive and uncertain project. The push to settle on a cap, however, will expend tremendous political energy. While small safety-valve manipulations will be possible, making adjustments to the overall cap, or the larger frame of reference, will be against political inertia. Another main support for cap-and-trade—its international scalability— rests on the assumption that previous experience with cap-and-trade systems will make them easier to implement in the future. Some proponents contend that because existing trading systems have achieved some success in the United States and Europe, other governments will be more likely to join such a regime. However, a closer look at the previous attempts of cap-and-trade does not portend future success. The European model, as discussed above, revealed some of the political disadvantages at work in a cap-and-trade system.153 In the United States, the recognized success of the sulfur dioxide cap-and-trade system may not necessarily translate into larger scale success. The trading system for sulfur dioxide, aimed at curbing acid rain, focused on 111 facilities in the Midwest.154 However, the United States has no experience with an economy-wide cap-and-trade system. Furthermore, some commentators believe that basing expectations for a carbon tax—something that impacts every sector of the U.S. economy—on past experience with small-scale, targeted policy instruments is misleading.155 Lastly, the argument that cap-and-trade is advantageous because countries have previous experience with the idea is neutralized by recent experimentation in many countries with carbon taxes. Denmark, Finland, Italy, the Netherlands, Norway, and Sweden have implemented some form of a carbon tax.156 British Columbia and Quebec also impose carbon taxes.157 While the programs are too recent to draw meaningful, long-term conclusions, the efforts promise to yield practical experience and valuable information. The final argument in support of cap-and-trade—its political complexity and opacity—is a disadvantage when properly understood. Cap-and-trade, as opposed to a carbon tax, is inherently complicated. A myriad of considerations must be addressed, including (1) establishing the baseline for the cap; (2) determining how allowances will be created and distributed; (3) devising a system for trade that prevents cheating and punishes those out of compliance; (4) creating systems of international trade and supervision; (5) establishing the use of variances and safety-valve mechanisms; (6) and rewarding offsetting projects like carbon sequestration.158 A cap-and-trade system also poses difficulties and high costs in enforcement. The mechanisms for distributing allowances and preventing abuse would require a new administrative body or a new office within an existing department like the Environmental Protection Agency. Cap-and-trade may also pose collateral issues that are not present with a carbon tax, such as Securities and Exchange Commission oversight for futures trading in allowances and complex tax considerations.159 C. Advantages of a Carbon Tax A carbon tax poses few of the problems associated with a cap-and-trade system and offers many more benefits. Unlike a cap-and-trade system, a carbon tax is fundamentally simple. Numerous characteristics beneficial to many tax systems are also at work in a carbon tax. For one, a carbon tax can be easily implemented, administered, and overseen. The administrative infrastructure already exists to levy taxes on fossil fuels, and the United States has extensive experience with economy-wide excise taxes on a wide variety of products, including gasoline.160 The government could conceivably implement a carbon tax with minor additions to the Internal Revenue Code.161 In fact, a carbon tax bill proposed by Representative John Larson, Connecticut, proposes adding three relatively short sections to the existing excise portion of the Code.162 Unlike cap-and-trade implementation—which would require new and extensive legislation—a carbon tax could apply broadly to all sectors in the economy with relative ease. Additionally, the administrative advantages could be heightened if the tax occurred at the source, such as the wellhead, mine, or port of entry. Taxing fewer entities that expect strong supervision could pass the costs downstream and would limit leakage. Lastly, the existing staff of the Internal Revenue Service, which has expertise in enforcing excise taxes, could oversee tax collection. Another characteristic that makes a carbon tax attractive is the predictability and transparency it offers to private investors. Unlike a cap-and-trade market where carbon allowances could experience extreme volatility, a tax provides long-term predictability for the price of emissions. Such a market constant would provide a steady benchmark against which new technologies must compete. Companies could implement more effective long-range plans for investing in the best technologies that reduce emissions. Furthermore, a carbon tax could be more predictable if the tax was self-adjusting and could counteract fluctuations in the price of carbon.163 The tax could conceivably be held in trust to ensure consistency and avoid politically motivated adjustments.164 Despite offering a steady carbon price, a carbon tax would still allow regulators to adjust the rate relatively easily if the price signal was understood to be too weak or too strong. Other major benefits of a carbon tax include quicker implementation and the ability to raise revenue. In terms of speed, the government could implement a carbon tax to take immediate effect, making it a much quicker method of reducing greenhouse gas emissions than a cap-and-trade system.165 A quick response is critical, as numerous commentators warn that the planet sits at a pivotal moment where immediate action may be necessary to prevent abrupt climate change.166 A cap-and-trade system would cause undue delay because it requires time-consuming efforts in scientific inquiry and policy making. Furthermore, because cap-and-trade lacks transparency, it would not provide a clear, stable price signal to influence investment decision-making until years down the road, possibly 2020.167 A quick restoration of United States’ credibility in the global environmental discussions is another benefit of a speedy response to climate change. Because a carbon tax could be effective before the next international treaty on greenhouse gas emissions, the United States could come to the table with a seriousness that is tantamount to the task at hand.168 Additionally, an in-place tax would bring practical experience and a focal point to the next round of international talks. A carbon tax could also generate substantial government revenue. The government could use the revenue to reduce other taxes and offset any regressive effects, making the tax imposition more neutral. Alternatively, carbon tax revenue could be channeled toward environmentally beneficial programs. Newer cap-and-trade proposals, it should be noted, often include government auctions of permits to raise revenue, which are aimed at emulating this inherent advantage of a carbon tax.169 However, an auctioning system necessarily implicates a middle-man and raises transaction costs. A carbon tax generates government revenue more simply and reliably.

### 2ac – at: cp – renewables

#### perm – do both

#### subsidizing alt energy fails – no conservation incentive, price rebounding, picking tech backfires

Hsu 11

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The case for government subsidization is, as a theoretical matter, straightforward. An unpriced externality like car-bon dioxide emissions can be remedied by either a positive price imposed by carbon taxes or by a negative price created by subsidization. If we know, for example, that lowering the carbon dioxide emissions from the energy sector will require the development and deployment of renewable energy technologies, then it would seem to make sense to provide government funding for wind, solar, and other renewable energy technologies. This would be true whether the subsidy takes the form of a per-unit production subsidy, or direct funding for research and development: either wav, the goal is to lower costs and concomitantly lower prices. Compare, then, the effects of taxing carbon and of subsidizing renewable energy. At the margins, raising the price of carbon-emitting energy has the same competitive effect of lowering the price (through subsidies) of renewable energy. The net effect of subsidizing renew- able instead of pricing carbon is a transfer of money from tax- payers to the entire energy industry—to the renewable energy industry through subsidies, and to the carbon-emitting energy industries by not taxing them. Since pricing carbon would raise energy prices, the net effect on the average person, who is both a taxpayer and an energy consumer, would appear to be roughly a wash. There are three core problems with this argument. First, and most simply, higher energy prices are needed to spur energy conservation. Low energy costs undermine incentives to make industrial processes more energy-efficient, drive less, better insulate homes and construct more -efficient buildings, and to develop and WII (and buy) energy efficient appliances. Energy conservation measures may in fact turn out to be the greatest source of greenhouse gas reductions. A re- cent report by the consulting firm McKinsey found that some fairly routine and well-known energy conservation measures could produce a whopping $680 billion dollars worth of net energy savings, and re- duce projected energy demand by the year 2020 by 23 petcent.20 Many energy conservation measures actually have a negative abatement cost—that is, their energy savings exceeded the amortized cost of the upfront investments. These included insulation retrofits for residential and commercial buildings (especially the latter), switching residential lighting from incandescent bulbs to LEDs (light-emitting diodes), and capturing methane from landfills to generate electricity. 21 As Dieter Helm has observed, a problem with climate pol- icy is that it has by and large focused on reducing greenhouse gases from production, and not consumption.22 Reducing consumption does not sound like a good thing for love-starved politicians who have no stomach to curb energy consumption through taxation, even as we waste energy in mind-boggling ways. But the simple truth is that efforts to combat climate change will be unsuccessful without steps to reduce consumption. And there is nothing as effective as higher prices if the goal is to reduce consumption. Second, there is a limit on how low energy prices can be made through subsidization. Lowering the price of renewable energy lowers the demand for fossil fuels. But lowering demand for fossil fuels means that it will lower the price of fossil fuels. A lower price for fossil fuels encourages its use, exactly what we don't want. This "rebound" effect of lowering fossil fuel prices by subsidizing its alternatives dampens the effectiveness of subsidies in altering consumption choices. Re- bound effects for various renewable fuel standards policies in the United States are estimated to be on the order of a quarter to a third of reduced emissions.23 Moreover, at a certain point, prices be- come so low that they become irrelevant. If, hypothetically, you had a choice between buying electricity from a coal-fired plant for 3.7 cents per kilowatt-hour or buying electricity from a wind farm for 3.4 cents per kilowatt-hour, which would you chose? The answer could well be, "who cares?" For many energy consumers, the savings does not justify the time needed to investigate. Such is the pushing-on-a-string effect of trying to lower prices for everyone instead of raising them. So while higher taxes and lower energy costs may seem to be a wash, they are not. Third, the effectiveness of government subsidies assumes with- out justification—in fact, in the face of a mountain of evidence to the contrary—that it is possible to identity the "best" renewable energy technologies, or in general the "best" ideas to reduce greenhouse gas emissions. Too often, legislators think they catch wind of a great idea—such a revolutionary way of doing something that they can hardly resist the temptation to lend some assistance (all the better if the idea comes from a constituent or potential donor). It requires a bit of gullibility to ignore the failure of these supposedly great ideas to at- tract sufficient private financing. The danger is not so much in the waste of taxpayer dollars—this is addressed in another part of this chapter—but that emissions reductions will be both smaller and costlier than if a better instrument was used.

#### even absent global adoption, the plan spurs clean tech – spills over globally, solves green energy cooperation

Meltzer 14

Joshua, Fellow, Global Economy and Development, Brookings Institution and Adjunct Professor, School for Advanced International Studies, Johns Hopkins University, “A Carbon Tax as a Driver of Green Technology Innovation and the Implications for International Trade,” ENERGY LAW JOURNAL v. 35, 2014, p. 58.

The adoption by the United States of a carbon tax will create an incentive for both U.S. and overseas firms to innovate and develop green technologies. As outlined above, a carbon tax can induce innovation by incentivizing U.S. firms to innovate and produce green technologies that reduce the impact of the tax. Not all firms will be innovators, and many will instead turn to the market to obtain the latest green technologies to reduce their CO<2> emissions. This demand for [\*58] green technologies by the world's largest economy will also create a strong global incentive for the development of new green technologies in other countries. Increased global innovation in green technologies will also have a range of positive spillovers. As new sources of R&D and opportunities for scientific collaboration open up, greater resources become available to fund the innovation process and the knowledge and skills to assess the commercial viability of green technologies increases the access to and reduces the costs of finance. These factors should drive down the costs of innovation and development of green technologies. A carbon tax will also incentivize the development of green technologies that can be used to reduce CO<2> emissions in the country applying the tax as well as overseas. This is because a carbon tax, unlike a technology standard, creates an incentive to find multiple ways of reducing CO<2> emissions. As a result, a carbon tax should lead to a broader range of innovations that could also be applicable in other countries. n101 The increase in innovation that would follow the introduction by the United States of a carbon tax should lead to new opportunities for international collaboration and cooperation. In some areas, the United States has already forged these ties, such as with the U.S.-China Clean Energy Research Center, and has clean energy partnerships with Australia, Japan, and India, to name a few countries in the Asia-Pacific region. n102 Asia-Pacific Economic Cooperation (APEC) is also working on energy issues, including promoting the development of energy efficiency technologies. n103 Additional areas where governments could make progress in promoting cooperation to develop green technologies should be in services trade. Indeed, access to the skills of researchers, policymakers, or venture capitalists with expertise in green technology will be as important for developing and commercializing it as will be access to the technologies themselves. For instance, countries could develop new and flexible visas aimed specifically at facilitating collaboration among people with green technology expertise. Expanding the General Agreement on Trade in Services (GATS) mode 4 commitments for services delivered by the presence of the service suppliers from another WTO Member would also support this outcome.

**renewable incentives don’t cause enough reductions**

Murray et al 14

Brian, director of the Environmental Economics Program at Duke University, Maureen Cropper, PhD and Department of Economics Chair at the University of Maryland, Francisco C. de la Chesnaye, Senior Project Manager at the Electrical Power Research Institute, John Reilly, Co-Director of the Joint Program on the Science and Policy of Global Change at MIT, “How Effective are U.S. Renewable Energy Subsidies in Cutting Greenhouse Gases?,” May 2014, American Economic Review, Vol. 104, Issue #5, p.573-574   
Policies at different levels of government have aimed to provide economic incentives to reduce GHG emissions. Many economists would favor placing a price on GHGs, either through a carbon tax or cap-and-trade program. However, political forces have limited the use of these approaches, favoring instead tax incentives for zero or low-GHG emitting energy. Unfortunately, there has been a dearth of studies that have examined the effectiveness of various tax provisions on emissions. To understand their effect requires understanding how the incentive affects market choices, given a complex mix of existing regulatory measures unrelated to the specific tax incentive, the reaction of multiple markets to the change, and ultimately the effect on emissions. The analysis presented here was motivated by a Congressional request to examine the issue. Our key finding is that, despite tax revenue losses of $10 billion per year in 2010, these provisions have a very small impact on GHG emissions and, in some cases, may actually increase emissions. The results are troubling if GHG reduction is a significant goal of these policies. There are several reasons why these incentives have failed to significantly reduce GHG emissions. The renewable electricity tax credits do increase renewable power generation, but the effect is small relative to the entire generating fleet. The impact of the ITC and the PTC is also reduced by the existence of renewable power mandates in more than half the states. On the biofuel side, the subsidies do indeed increase the production and use of the subsidized products; however, this does little to lower the carbon intensity of fuel use because of the lifecycle emissions from the cultivation of the feedstock, and transportation and production of the fuel. Moreover, the subsidy lowers the price of gasoline, leading to a classic rebound effect that increases emissions from higher gasoline use. The findings also point to the importance of representing the complex institutional and market interactions inherent in these policies. Economists have been able to reduce many complex market relationships to simple elasticity estimates. A significant result of this study is that such reduced-form relationships can leave out structural aspects of the market and regulatory environment, and lead one astray. Perhaps it is not surprising that the tax code provisions studied are not particularly effective. Emissions reduction is only one of the policy’s objectives; energy security, spurring “green” technology growth and rural economic development are others and the provisions are narrowly targeted at only a few emitting activities. Given the lack of political will to introduce a more effective GHG tax or cap-and-trade program, maybe the most we can hope for are tax incentives or other narrowly directed measures. However, based on this study, these do not appear likely to take us very far in reducing GHG emissions.

#### climate prizes fail – empirics

Brüggemann and Meub 15

[Julia Brüggemann, Chair of Economic Policy and SME Research, University of Göttingen, EXPERIMENTAL EVIDENCE ON THE EFFECTS OF INNOVATION CONTESTS, CEGE, Number 251, http://wwwuser.gwdg.de/~cege/Diskussionspapiere/DP251.pdf]

5. Concluding Remarks The present article provides novel empirical perspective on the discussion regarding the use of innovation contests as a policy instrument to foster innovation activity. Accordingly, we transfer a sequential innovation setting to the lab by building upon a real effort word creation task. We analyze cooperation behavior and innovativeness in two types of innovation contests, namely a prize for the aggregate innovativeness and an additional prize for the best innovation. Our results show that both types of contests substantially reduce the willingness to cooperate among subjects, as demanded royalty fees significantly increase. Nevertheless, this does not reduce the actual cooperation, i.e. the propensity to make use of other innovators’ products. Despite the higher royalty fees in the innovation contest treatments, the total innovativeness remains constant across treatments. This finding illustrates that subjects accept paying higher royalty fees when striving to win an innovation contest. Our results further indicate that the intensified competition in innovation contests tends to reduce the individual income opportunities, given that higher royalty fees have to be paid. Moreover, we derive some general policy implications. Let us consider the potential effects of innovation contests on aggregate welfare. Our results show that welfare is not necessarily increased, especially when opportunities to innovate are restricted, e.g. by the sequentiality of the process itself or constraints in the available investment capital. Furthermore, when considering the transaction costs for organizing the contest and the costs of the prize itself, overall welfare might substantially decrease. This issue is particularly relevant for state- subsidized contests, whereby taxes are reallocated while no adequate gains in innovation activity might be achieved.

## actor

### 2ac – at: cp – states

#### federal action is key – price differential and no modelling

Morris et al 16

Adele - Senior Fellow - Economic Studies, Climate and Energy Economics Project, Policy Director - Climate and Energy Economics Project, Brookings Institution [Adele Morris, Yoram Bauman, Carbon Washington, David Bookbinder, Niskanen Center, State-Level Carbon Taxes: Options And Opportunities For Policymakers, 7/28/16, https://www.brookings.edu/wp-content/uploads/2016/07/State-level-carbon-taxes-Options-and-opportunities-for-policymakers.pdf, Date Accessed: 9-27-16

To be sure, this hardly lays out an economically ideal approach to the mitigation of global climatic disruption. While far better than nothing, even a reasonably coordinated collection of state and provincial carbon pricing policies, in part derived from a patchwork of federal regulations and supplemented by a collage of other federal and sub-national policies, would create inefficiently disparate abatement incentives across sources, gases, sectors, and jurisdictions. Relying on state action also complicates international negotiations around both emissions targets and carbon prices. For example, it is difficult for the U.S. State Department to make a strong case to other countries that the United States will achieve a particular emissions goal by a certain date if the policies to attain it are directed by state actors over which the federal government has little control. Arguably, a more comprehensive approach, across and within major economies, will prove indispensable to achieve ambitious GHG stabilization targets at reasonable cost. But in the absence of new federal legislation in the United States, this scenario of state and provincial coordination is about as good as it could get.

#### states don’t have the capacity to enforce the tax especially when they’re coordinating

Rabe 15

Barry G., Professor of Public Policy in the Ford School @ Michigan, holds appointments in the School of Natural Resources and Environment and the Program in the Environment. He is a non-resident senior fellow in the Governance Studies Program at the Brookings Institution, 20 May 2015, The Durability of Carbon Cap-and-Trade Policy, http://onlinelibrary.wiley.com/doi/10.1111/gove.12151/full, Date Accessed: 9-27-16

Two, does the policy provide governing agencies sufficient flexibility to take advantage of policy learning through mid-course adjustments once performance indicators emerge and trouble spots become evident? This reflects needed flexibility in policy design and skill to identify problems and respond accordingly. Intergovernmental relations studies demonstrate that adaptive capacity is a particularly significant challenge at state and local levels, where staffing levels and disciplinary range vary markedly, and yet tailoring policies to changing localized circumstances may be essential to their long-term survival. This may be a particularly challenging issue in cases where multiple states are attempting to work together and must find ways to adapt within state and regionally. Such flexibility may be especially crucial in complex policies such as cap-and-trade, which essentially try to chart the future of a state's energy demand and supply in developing a plan for emissions reduction that is expected to last nearly a half-century (Carlson and Fri 2013). In turn, states may only have attempted to operationalize cap-and-trade in one prior instance, the sulfur dioxide case in which responses to sulfur emissions were readily available via minable coal with low-sulfur content or viable emissions-control technology. States launching their own version of cap-and-trade for carbon in confederation with other jurisdictions faced far greater complexity, lacking any overarching federal framework to make needed adjustments, federal agency support for state operations, readily accessible energy alternatives to fossil fuels, or viable emissions-abatement technology. State policy professionals attempting to sustain operations of a new carbon cap-and-trade arrangement would not only need some continued support from elected principals through various election cycles and leadership changes but also analytical skills, reliable data, and managerial latitude to navigate inevitable bumps following initial adoption. Three, does the policy have the capacity to produce demonstrable outcomes or benefits that can build and sustain constituency support, especially in the face of future political challenges? Both developmental and redistributive policies have long relied on the tried-and-true method of distributing either cash or visible social services to recipients, thereby building a base of familiarity among recipients and support for policy continuation (Campbell 2003; Mettler 2005). Eric Patashnik has referred to such programs as having “a massive tangible impact on citizens' lives on a daily basis” (Patashnik 2008, 29). Indeed, redistributive programs have frequently been adjusted to reach larger constituencies over time, in part to expand their constituency base (Peterson, Rabe, and Wong 1986), and a wide range of social welfare programs has proven remarkably durable even after major political challenges (Pierson 1994). An analysis of the Affordable Care Act anticipated that the early rollout of new health-care benefits would serve to build constituency support and dampen opposition (Skocpol and Jacobs 2011). Regulatory policies have generally lacked this opportunity. Reliable measurement of their impacts often remains unclear, limiting their capacity to produce clear-cut deliverables for citizens. This challenge would appear especially great in an area such as reducing short-term fossil fuel use and greenhouse gas emissions in hopes of decreasing long-term climate risks. Most Americans are likely unaware that national emissions have declined by more than 10% in the past decade due to a range of policy, economic, and shale-based energy development factors, much less comprehend how they personally have benefited from this occurrence. Political efforts to frame climate mitigation as an economic development or “green jobs” strategy have proven extremely difficult to assess credibly in economic terms, let alone demonstrate benefits to the general citizenry. Initial public support or indifference may turn to opposition if increased energy costs related to cap-and-trade fail to generate any clear-cut benefits and thereby undermine its prospects of becoming a durable policy.

#### states can’t do carbon tax – huge constitutional issues guarantee endless litigation – only federal action can solve

Ferrey 08

Steven, Professor of Law at Suffolk University Law School, and in 2003 was Visiting Professor of Law at Harvard Law School, author of six books and more than seventy-five articles on the energy, environmental, legal and policy interface, Ecology Law Quarterly, Volume 35 Issue 4 Article 4, September 2008. “Goblets of Fire: Potential Constitutional Impediments to the Regulation of Global Warming.” http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1888&context=elq, Date Accessed: 9-27-16

The law is a stubborn thing. Carbon policy would be much more seamlessly implemented at the state level in a coordinated fashion by leading states if the Constitution did not get in the way. However, the manner in which most of the states have attempted to regulate carbon raises significant potential constitutional challenges. First, because states do not want the carbon reduction costs they impose on their in-state generators to attract higher-carbon power from out-of-state power imports, they seek to secure the borders, or at least surcharge and dissuade the intruding power flows.458 Because the states are attempting to not only regulate carbon produced within their borders, but also create carbon regulated islands into which externally-produced wholesale power can no longer enter freely without penalty, there are significant Commerce Clause issues. Wholesale electricity moves in interstate commerce at the speed of light.459 While it is perfectly understandable why certain states see this as a policy imperative, their actions trip over historic legal prohibitions against impeding the free flow of commerce based on the geographic point of origin of that commerce. Second, the decision of most of these states to maximize associated revenues by auctioning all of their newly created allocations to emit carbon triggers Supremacy Clause concerns. 460 Again here, the motives may be worthy: public money is limited, carbon emissions loom large on the policy landscape, and auctioning allocations to emit carbon maximizes public income while rationing the emissions. The motive appears even more integrated when states propose to utilize the revenues of this allocation sale to fund a variety of programs that will reduce greenhouse gas production within the state.461 However, jurisprudentially, motive matters according to the Supreme Court. States officially have expressed their purpose of this auction to increase the price for certain high-emitting carbon power plant operations (coal in particular), as a way to change the dispatch order of which plants are allowed to run by the FERC-regulated Independent System Operator.462 The announced objective is to make the operation of certain high-carbon-emitting plants so expensive that they become the last plants called on to operate by the regional ISO. When unit dispatch order and operation, solely a function of federally jurisdictional pricing in modem electricity markets, is manipulated indirectly by states that attempt to inflate the federally approved wholesale price at which certain facilities operate, it becomes constitutionally suspect under the Supremacy Clause. 463 When there are ignored, more direct, and less legally burdensome ways 464 to get at these carbon issues, such as by requiring a certain percentage of renewable energy or low-carbon energy in the power supplymix,4 65 the probability of finding a state legally overreaching the normal exclusive wholesale jurisdiction of the FERC to regulate wholesale power pricing is more likely. Nowhere is the line of demarcation of federal-state responsibility pursuant to the Supremacy Clause more firmly etched in the legal precedent than in power sector regulation. In fact, Supremacy Clause jurisprudence in the power area has its own distinct nomenclature-the filed rate doctrine. 466 This bright line between federal and state jurisdiction has been firmly and consistently carved in the judicial firmament over three-quarters of a century. Finally, but perhaps less clear, are constitutional issues with the Compact Clause and foreign commerce powers. 46 7 While this may or may not affect RGGI, it is another issue that can be litigated and thus undercut legal confidence in, and regulatory certainty of, state carbon regulation programs. Califomia's joining with other western states and some Canadian provinces raises foreign commerce issues. This is not to mention a host of other legal issues, beyond the scope of this Article, that some of the state carbon regulatory initiatives may run afoul of state statutes. These latter issues can be more readily cured by remedial state legislation or other action. However, the Commerce Clause and Supremacy Clause issues are fundamental elements of the U.S. Constitution. They are not cured by any legal state action which would be inferior to the Constitution itself. Having focused on the legal issues accompanying the particular way the leading states have embarked on carbon regulation, nonetheless, intelligent carbon policy is imperative. The consensus of scientific opinion is that this is the preeminent ecological issue of this century. Some of the most respected climatologists argue that we have until 2015 to radically reduce the emission of C0 2, or face a very different planet.4 68 We require an expedited, targeted carbon policy to temper the Goblet of Fire that powers industrial society. But it does little to accelerate carbon restrictions at the state level, only to walk into protracted litigation that will truncate or halt the implementation of these initiatives. Whether the constitutional issues raised by the structure chosen for these state carbon schemes in the United States will prove to be fatal, is only one consideration. The corollary point is that the constitutional issues are real enough not to be easily dismissed by a court, and thus guarantee years of litigation and appeal, during which time these programs will be stunted, if not enjoined altogether. And if Dr. Hansen is correct that carbon emissions worldwide must be reversed by 2015,469 then we will expend the majority of these precious remaining years litigating the constitutionality of state carbon schemes instead of implementing legally sound solutions. These Commerce Clause and Supremacy Clause issues are just now beginning to be raised470 against the less controversial renewable energy trust fund and Renewable Portfolio Standard programs that half the states have adopted as matters of state law.471 There is some legal similarity in the design of RGGI and these trust fund programs. In fact, use of system benefit charges 472 and trust fund expenditures is one suggestion of how to defend the RGGI scheme may deal with the major problem of "leakage." However, the existing state renewable programs have escaped legal challenge until mid 2008 for reasons that the carbon regulation programs will not: \* The trust fund programs are financed by taxes in the retail utility bill to all ratepayers, and are spread across the utility consumer rate-base so that the impact on any stakeholder is de minimus at a few cents each month.473 \* Carbon regulation will impose huge financial obligations differentially on different generating sources, depending on their carbon emissions and size. While the impact is vested only on a limited number of stakeholders, that impact is significant and dramatically shifts the playing field for electric power production, fuel source, and economic viability in deregulated markets. 474 \* Carbon regulation in the RGGI region will only target CO2 emissions from larger power generating sources; 475 it exempts smaller units and exempts other GHGs that are up to several thousand times more potent per molecule in causing global warming and persist in the atmosphere much longer than CO 2. 476 \* There is a broad constituency for the "carrot" of grants to fund renewable energy trust fund projects, without any stakeholder objecting - most rate payers do not know they are paying for these programs and utilities are held economically harmless and can take some credit for the program. By contrast, there will be significant resistance to the "stick" of carbon taxes and allowance auctions imposed on previously unregulated independent power producers. 477 \* It is unprecedented that government in the United States charges targeted regulated entities for allowances to emit air emissions. 478 The stakes and stakeholders are very different in carbon regulation and renewable energy support. Both Governor Schwarzenegger's energy advisor and industry groups looking at RGGI implementation forecast litigation.479 While these litigants are initially targeting the non-constitutional grounds, over time the broader issues will be apparent. In sum, the state scheme for carbon regulation, once the program regulations become final,480 is sure to be challenged legally by the adversely affected stakeholders. This Article has suggested that states have legal discretion to shape carbon policy within constitutional bounds. In the end, it may be that federal carbon legislation is necessary not only for uniformity and certainty, but to eliminate the issues of the Commerce Clause, Supremacy Clause, and Compact Clause in state-formulated carbon regulation. If RGGI really was an effort to get the federal government to take more definitive action to regulate carbon emissions, 481 then it has been effective. And if RGGI encounters constitutional challenges, this may be a more lasting achievement. All of these issues arise only because carbon regulation is being implemented differentially by state action, which in some instances may overreach the limits of state authority or set up geographically based ring-fences. And here may be the compelling reason for prompt enactment of carbon legislation at the federal level-it will result in immediate action rather than years of litigation. Federal carbon regulation avoids the challenge to individual state actions and constitutional issues. Truly, time is of the essence, and good policy regarding the goblets of fire should follow suit to address carbon emissions.

#### perm do both – cooperative federalism is effective in the context of climate regulation

Ryan 2015 – Prof of Law @ Florida State University  
Erin, “Environmental federalism 's tug of war within” in The Law and Policy of Environmental Federalism, Edward Elgar, p. 399-400

Evolving climate and energy governance offers great opportunity to craft new models of dynamic intergovernmental regulation, but even the most established environmental laws - including the Clean Air202 and Water Acts, 203 the Safe Drinking Water Act, 204 the Resource Conservation and Recovery Act, 205 the Surface Mining Control and Reclamation Act,206 the Superfund Act,207 the Emergency Planning and Community Right-to-Know Act,208 and even the Endangered Species Act209 - all incorporate programs of cooperative federalism in which state and federal actors simultaneously operate within a single regulatory organism.21 0 Rather than merely colliding over separate efforts that occasionally overlap, these traditional programs of cooperative federalism all purposely engage state and federal actors in an ongoing series of consultation, negotiation, and compromise.211 The following section explores in more detail how the more traditional models of environmental federalism allocate state and federal authority in realms of jurisdictional overlap.

### ---links to politics

#### cp is more politically costly than the plan

Rosenbaum 2014 – Prof Emeritus of Political Science @ U of Florida  
Walter A, *Environmental Politics and Policy*, 9th Edition, Sage Press, p.186

The backlash against emission controls often falls on state government officials who, under existing federal law, usually are responsible for setting specific emission levels, prescribing the proper technologies, and enforcing emission restraints on specific sources. Enforcing emission controls is accomplished largely through issuing a permit to individual dischargers specifying the permissible emission levels and technological controls for their facilities. Despite several decades of experience and substantial financial assistance from the federal government, some state regulatory authorities remain understaffed and undertrained. In the late 1990s, however, most state regulatory agencies had become highly professional to the point where failures in state environmental regulation could no longer be routinely attributed to incompetence. The political and economic influence of regulated interests, nonetheless, is often far more formidable in state capitals than in Washington, DC, and state regulators often feel especially vulnerable to these local pressures.

# at – econ da/pic

### pics theory

#### PICs are a voting issue – they moot the entire AC and force a 1ar restart creating a 13-7 time skew - kills reciprocity and fairness which is a voter since it’s constitutive of a competitive activity. They also incentivize debaters to find the most obscure and tiny parts of the lit that that are impossible for the aff to research and have little to no quality aff ground – also un-educational because it shifts the debate from the core of the topic to cheaty positions that avoid clash and engagement.

### solvency defecit

#### the PIC doesn’t solve leadership because allowing for exemptions for certain [industries/whatever] shows that we are not fully committed to global governance of structures like climate change. Making an exemption shows unreliable commitment to solving global warming.

### 1ar – at: econ decline

#### No impact to economic decline — countries respond with cooperation not conflict

Clary 15 — PhD in Political Science from MIT and a Postdoctoral Fellow at the Watson Institute for International and Public Affairs at Brown (Christopher, “Economic Stress and International Cooperation: Evidence from International Rivalries,” *MIT Political Science Department*, Research Paper No. 2015-8, p. 4)

Economic crises lead to conciliatory behavior through five primary channels. (1) Economic crises lead to austerity pressures, which in turn incent leaders to search for ways to cut defense expenditures. (2) Economic crises also encourage strategic reassessment, so that leaders can argue to their peers and their publics that defense spending can be arrested without endangering the state. This can lead to threat deflation, where elites attempt to downplay the seriousness of the threat posed by a former rival. (3) If a state faces multiple threats, economic crises provoke elites to consider threat prioritization, a process that is postponed during periods of economic normalcy. (4) Economic crises increase the political and economic benefit from international economic cooperation. Leaders seek foreign aid, enhanced trade, and increased investment from abroad during periods of economic trouble. This search is made easier if tensions are reduced with historic rivals. (5) Finally, during crises, elites are more prone to select leaders who are perceived as capable of resolving economic difficulties, permitting the emergence of leaders who hold heterodox foreign policy views. Collectively, these mechanisms make it much more likely that a leader will prefer conciliatory policies compared to during periods of economic normalcy. This section reviews this causal logic in greater detail, while also providing historical examples that these mechanisms recur in practice.

#### Economic collapse is inevitable and tech can’t solve — only a transition away from growth prevents extinction.

Michaux 16 — Researcher of industrial recycling at the University of Liege and a PhD in mining engineering (Simon, “Peak Mining: Stepping down from high resource use,” in Haydn Washington & Paul Twomey (Eds.) *A Future beyond growth: Towards a steady state economy*, p. 90-92)

The existing trends resulted in the complete depletion of natural resources, which seriously hampered fundamental reform. The basic behavior model of the world system is exponential growth of population and capital followed by collapse. Application of technology to the apparent problem of resource depletion or pollution or food shortages has no impact on the essential problem of exponential growth. Population crisis and crash could be postponed, but not indefinitely. Turner (2008) from the CSIRO examined the conclusions put forward by the original study in the context of data collected for the 30 years after the 1972 report was released. This showed that for 30 years, world data has tracked close to the original Limits to Growth models. These seem to be symptoms of a world in ‘overshoot' (Catton 1982), where we are drawing on the world's resources faster than they can be restored, and we are releasing wastes and pollutants faster than the Earth can absorb them or render them harmless (see Washington in this volume). It would seem they are leading us toward global environmental and economic collapse. Evolution of human civilization Every non-renewable natural resource we depend upon is now depleting to the point of peak extraction, or will do so soon. Industrial systems that are heavily dependent on energy reserves and metal resources are now at serious risk of collapse as production of those raw materials will soon not be able to meet demand. All living systems on the planet are in serious stress and are also being heavily degraded (MEA 2005). Natural ecosystems of all kinds are being depleted in the name of uncontrolled economic development. The planet's climate is also undergoing rapid change, while entire regions of the planet are heavily polluted. As the Earth's natural bio systems are being devastated by human industrialisation, the planet has been forced to absorb the environmental fallout while economic targets have been pursued. Thus, economic performance has been seen as important, and environmental pollution has been ignored. While humanity has been able to do this to date, there will soon come a time when planetary environmental degradation will mean that industrialisation will not be feasible, therefore neither will our global society or the global economy. As our economic and financial systems are volatile and virtual in form (with a foundation of consumer confidence and administered as electronic data as opposed to being based on physical assets), the economic system would be the first system put under functional stress in a fashion that would impact the industrial society to operate normally. Our financial institutions and nation state economies are saturated with debt (US Debt Clock 2015) and are not in a position to engage in industrial reform. A fundamental problem is the exponential growth of the human population, in conjunction with industrial technological development consuming pre resources per capita as time progresses. All of the activities that describe human development can be modelled using an exponential function. As this is a finite planet, there will come a point where resource scarcity will override economic development. We are reaching such a point, or it's possible we may have passed it already. The fundamental challenge that faces humanity is a choice between our consciousness and our ability to learn from our mistakes, or our cultural conditioning from our past. Are we driven to consume everything in our path? Or can our intelligence and understanding help us evolve to become a respectfully sustainable society? If we wish to take our place on this planet as a genuinely sustainable species, 'we the people' have to decide what kind of world we wish to live in. This choice is now upon us. Peak mining is a symptom of an unsustainable worldview, ethics and a 'shop till you drop' consumer culture (pushed along by massive advertising spending) (see Assadourian in this volume). The limits of the Earth are becoming more apparent - and peak mining and energy demonstrate this as well as other indicators such as an unsustainable ecological footprint. In terms of a steady state economy, Daly (1991) made it clear that a key aspect was low sustainable resource use. Peak mining shows the essential need for such a commitment, and also shows us that low resource use is not just a good idea philosophically and ethically (which it is), it is essential for very practical reasons. The world is finite, so endless physical use of non-renewable resources cannot work. Our culture needs to accept that reality, and evolve and transform.

### ---2ar – Clary

#### You should frame the collapse debate through the concession of the 3 internal warrants within the Clary 15 evidence card

#### Statistics – Clary surveyed 109 distinct rivalries that were tested by economic downturn since 1950 and found that economic downturn halved the chance of war -- “Trump is unique” isn’t responsive because the data was true even given unstable leaders

#### Austerity – downturn leads to pressures for leaders to cut military spending to save money, not expand it – that means even if Trump wants to lash out, he can’t because congress would have already rationally cut military spending

#### Strategic Reassessment – in order to justify austerity, leaders downplay potential rivals to assure the public that it’s ok and the economy is more important – Trump’s base is already tending toward isolationism – they were super upset by Syria strikes and would prefer the economic help he campaigned on which means it isn’t a hard sell for the GOP to convince them China isn’t such a big deal anymore – that removes any incentive for diversion

### ---2ar – Michaux

#### Economic growth is incompatible with the environment — Resource extraction — industrial systems rely on extraction of finite resources that degrade the environment in pursuit of profit. That’s Michaux. That outweighs –

#### 1. Hidden threshold — ecosystem interconnectedness means any minor disturbance could be the last one and create total collapse.

#### 2. Existential risk — all systems rely on the environment — growth pushes the planet beyond capacity.

#### 3. Ecosystem destruction terminates growth — resource scarcity limits economic development that decreases profit and causes economic collapse.

# da

## federalism

### 1ar

#### Federalism collapse inevitable – litany of regulations and funding cuts

Henry 16

Devin 8-17, 8-17-2016, "Business lobby slams EPA for unfunded mandates," TheHill, http://thehill.com/policy/energy-environment/291695-chamber-hits-epa-for-unfunded-mandates, Date Accessed: 10-24-2016

States are on the hook for implementing the majority of federal environmental regulations but receive little federal money to help them do that, according to a new report from the U.S. Chamber of Commerce. In a study released Wednesday, the Chamber found federal grants cover only about 28 percent of the funding states need to implement Environmental Protection Agency (EPA) rules. The study found grant assistance has declined 29 percent over the course of the decade even as the cost of implementing EPA rules has increased by more than one-third. The report comes after the Chamber and its allies waged lobbying and legal campaigns against three major EPA rules released last year. Those regulations set limits on carbon pollution at power plants, establish federal control over small waterways and limit surface-level ozone emissions. The rules, the Chamber, business groups and the energy industry warn, will lead to higher costs for businesses and hinder states by requiring more regulatory oversight. “Instead of being the system of cooperative federalism that Congress intended, the current relationship between the Environmental Protection Agency and the states has become one-sided, with the federal government imposing its will,” William Kovacs, the Chamber’s senior vice president of environment, technology and regulatory affairs, said in a statement.

## horsetrading

### at: horsetrading – epa

#### No horse-trading for EPA regulations

Kreutzer 12

David Kreutzer, senior research fellow in energy economics and climate change at The Heritage Foundation's Center for Data Analysis, The right time for a carbon tax is never, Energy (The Daily Signal Nov. 20, 2012), http://dailysignal.com//2012/11/20/the-right-time-for-a-carbon-tax-is-never/.

Revenue neutrality is out, but what about eliminating overly burdensome regulations? Some proponents of a carbon tax believe the tax properly prices the externalities that vex opponents of fossil fuels and, therefore, eliminates the need for regulation of carbon dioxide. Bolstered by this knowledge of economics, they expect any deal for the tax to include eliminating all or a significant part of these regulations. That logic may work in PowerPoint-filled rooms at think tanks, but not in the proverbial smoke-filled rooms in Congress. If this logic did carry over, then cap and trade also would have eliminated the need for carbon regulation. Instead of reducing regulations, the cap-and-trade bills added them. For instance, the Waxman-Markey bill went on for nearly 700 pages before it even got to cap and trade. Just in case there might be some confusion as to whether the left is willing to trade off regulation for a carbon tax, Representative Henry Waxman (D-CA) recently cleared things up: “A carbon tax or a price on carbon would be a strong incentive for the development of new technologies. But because it’s so complicated, I would not support preempting EPA. EPA can assure us that we can actually get the reductions we need.”

## LNG

### 2ac – at: da – lng

#### No link UQ – decoupling – new demand is based on spot markets which eliminate us price advantage

Weyo 15

Senior Energy Analyst – Bentek Energy (Ross, "LNG Exports: Oasis or Mirage?" August, benport.bentekenergy.com/documents/LNG\_Exports\_Oasis\_or\_Mirage.pdf)

Despite most US LNG export facilities having secured contracts for more than 80% of their available capacity, there remains a distinct risk of underutilization over the next five years, particularly during periods of low global demand. Underutilization will largely be a risk to capacity held by portfolio markets, which do not necessarily have access to firm downstream demand, whereas utility demand is expected to be more certain. Utility marketers make up about 44% of total US export capacity, whereas portfolio marketers make up around 37%. The remaining 19% is currently unsubscribed and will likely be marketed by the export facilities themselves, making it essentially another form of portfolio capacity (See Figure 5). In an environment with plenty of length in the global LNG markets, which we appear to be entering, portfolio marketers may have to compete to deliver the marginal cargo into demand markets. This would typically occur when global demand is low and there is plenty of length in the spot market. Under those circumstances, US export capacity holders are likely to operate without regard to their sunk cost tolling fees and deliver gas at a cost of feedstock + transport + margin. As new US supplies begin flowing into the market and driving down prices, new demand will be triggered regionally. These regional price supports include the Asian Coal Switching Price the European Coal Switching Price, wherein domestic power producers will forego coalfired generation in favor of cheaper gas-fired generation if LNG prices fall low enough, thus creating price support in the form of additional demand. The marginal cost of delivering gas from the US into Asia and Europe is also set to become an important price support between now and 2020 during periods where supply far exceeds demand. When global spot prices fall below the marginal cost to deliver a US LNG cargo to market (ignoring sunk costs), a US capacity holder may forgo their option to liquefy, thus depriving the market of supply and supporting prices. This optionality of US LNG exports, wherein supply can be turned “on” or “off” in response to price, will become a key price signal over the coming years, informing markets when additional US supply is needed and shutting in US supply during times of low demand. Year-to-date, spot LNG cargoes delivered into Asia have fetched an average price of $7.55/MMBtu, down 50% from a year ago. At the same time, long-term contracts, which are traditionally indexed to oil, fell to an estimated $8.59/MMBtu, a 47% drop from last year. Spot cargoes, as measured by the Japan Korea Marker (JKM), have traditionally traded below the long-term oil-indexed price, with winter demand swings that drive the spot price above the long-term contract price. During the winters of 11-12, 12-13 and 13-14, spot prices averaged $17.11/MMBtu, $0.55/MMBtu stronger than long-term prices. Last winter, however, spot deliveries into Asia averaged $7.55/MMBtu, $0.20/MMBtu weaker than the long-term price (See Figure 6). Firstly, this winter inversion of spot versus long-term pricing indicates that the market was in fact oversupplied and buyers unwilling to enter the spot market to buttress winter supplies. Secondly, and perhaps more importantly, it suggests that a “decoupling” may be occurring between long-term oil-indexed supply and short-term/spot supplies. Looking further back, we can see that spot LNG has, at times, traded at a significant discount to long-term oil-indexed supplies. Between 2010 and mid-2011, the spot price for LNG cargoes delivered into Asia averaged $9.03/MMBtu, 32% lower than the long-term cargoes. During that time, spot LNG cargoes were priced more in line with the European market (NBP), which absorbed much of the additional length in the global LNG markets and acted as a price floor for LNG. Earlier still, in 2009, we can see that the US market (Henry Hub) was the price floor, absorbing global supplies at a myriad of recently commissioned import terminals. The impending rush of new LNG supplies and a diminished outlook on global demand suggest that we will once again see a decoupling of spot LNG prices from long-term oil-indexed prices, which will first reveal itself as weakness in the European market and will eventually bring global LNG prices in line with the US Henry Hub + transportation costs + margin. This new paradigm is likely to stand as long as the US has spare export capacity above global requirements.

#### Exports aren’t cost-competitive – there’s a huge global supply glut, and demand has cratered supply glut

Kelly 16

Sharon, attorney based in Philadelphia, has reported for the New York Times, The Nation, National Wildlife, and Earth Island Journal, “Will LNG Exports Save the Shale Gas Drilling Industry's Profitability? Not So Fast,” 4/14, Desmog, http://www.desmogblog.com/2016/04/14/will-lng-exports-save-shale-gas-drilling-industry-s-profitability-not-so-fast, Date Accessed: 9-26-16

In other words, unfortunately for the shale drilling industry, those new shale exports are entering a world market that is also suffering from its own sudden collapse in prices. LNG prices hit 18-year lows this month, in part due to collapsing demand from China and other Asian countries for commodities and in part because other countries have also invested heavily in building export facilities at the same time as the U.S.. “U.S. LNG will materialize at a time when the biggest market (Japan) is witnessing a demand reduction and when supply is growing again massively thanks to Australia,” said Thierry Bros, senior gas analyst at Societe Generale, told Reuters in October. “This is the worst possible timing for this new LNG that has no dedicated market.” Before the shale rush, companies spent billions building import terminals, only to suddenly face a domestic supply glut that abruptly made American-drilled gas cheaper than LNG from overseas. “Ten years ago, we thought we were facing a gas shortage and we built all of these facilities to import natural gas,” Frank Wolak, a Stanford University energy expert, told the Los Angeles Times in 2014. “Now they are all sitting idle.” Now, it seems, the LNG industry may once again be facing a sudden and unexpected reversal. “Just two years ago, exporting LNG from the U.S. sounded like a lucrative opportunity for shale drillers. Buyers in Northeast Asia were paying up to $20 per million British thermal units more than spot Henry Hub gas prices,” Bloomberg reported in March. “That premium has collapsed, this week trading around $2.70.” And since the process of liquefying the natural gas and shipping it carries additional costs — potentially enough to eat through all of the higher price that LNG commands in some international markets — that's bad news for the shale drilling industry, already under enormous financial pressure from the collapse of oil prices by roughly two thirds since 2014.

#### If the plan makes renewables less expensive, there’s less demand for gas domestically so we can export more

Gilbert 16  
Alex, former researcher for the market research firm, EBW Analytics Group, where he analyzed electricity, natural gas, and oil markets for industry clients, “The Case for Natural Gas and Renewable Energy,” Feb 4, https://www.sparklibrary.com/the-case-for-natural-gas-and-renewable-energy/, Date Accessed: 9-26-16

The use of renewable energy to hedge against natural gas price volatility is increasingly recognized – the city of Austin recently prioritized the development of solar at least in part as a hedge against natural gas price volatility.¶ In addition to hedging against price volatility, renewable energy can also reduce overall natural gas prices by reducing demand. A recent joint study by LBNL and NREL found that renewables used for RPS compliance in 2013 lowered natural gas prices by $0.05-0.14/MMBtu, saving consumers $1.3 to $3.7 billion. As RPS mandates and renewable energy grow in the future, this downwards price pressure on natural gas is only likely to grow.¶ More broadly, renewables are also attractive financially because they protect against overreliance on natural gas at a regional level. With coal generation in a death spiral, oil generation almost nonexistent, and nuclear stagnant, natural gas generation has made significant gains in the last several years.¶ Some of the most notable gains have been in the Northeast – between 2000 and 2014, New England’s natural gas generation went from 15% to 44% of overall generation. The region’s grid operator has found that this massive growth has resulted in winter reliability challenges and negative economic impacts.¶ Renewables offer a prime opportunity to address these challenges in New England and prevent over dependence on natural gas in other regions.

## nuclear

### 2ac – at: da – nuclear

#### Carbon tax doesn’t cause shift to nuclear power

Kee 16

Edward Kee, MBA, Harvard University BS in systems engineering, US Naval Academy, specialist in the electricity industry with experience in nuclear power, electricity markets, restructuring, regulation, private power, and related issues, Carbon pricing not enough to help nuclear power (Jun. 8, 2016), http://www.world-nuclear-news.org/V-Carbon-pricing-not-enough-to-help-nuclear-power-10061601.html.

Politically feasible carbon pricing is not likely to provide the long-term revenue needed to support existing or new nuclear power projects. Instead, project-specific activities should be undertaken to keep existing nuclear in operation and to drive investment in new nuclear power plants - with the cost of these activities recovered as a cost of controlling carbon, writes Edward Kee. Economic analyses of nuclear power projects reflect carbon price revenue, but only as a low-probability upside scenario for equity investors. The benefits, timing, level and certainty of carbon prices will need to change if nuclear power project investors and lenders are to consider carbon price revenue as a key part of project economics. Carbon prices provide no direct benefit to nuclear power, but increase the cost of fossil fuel electricity in ways that may result in indirect benefits for nuclear power. Higher costs for combustion-based electricity due to carbon prices will make nuclear electricity appear more competitive for traditional electric utilities. Carbon prices will increase system marginal prices in electricity markets that will increase electricity costs for consumers and increase revenue for nuclear power plants. Increased nuclear power revenue will not be associated with increased carbon tax revenue, complicating plans for a revenue-neutral carbon tax scheme and raising the potential of windfall profit taxes on nuclear (as, for example, in Finland). When electricity market prices are low or negative, carbon prices will provide no benefit to nuclear power plants. The timing of carbon prices is in doubt. After more than a decade of discussion, there is no carbon tax in the USA and the proposed Clean Power Plan provides no benefits for existing nuclear plants. Despite COP21 "commitments" to reduce carbon, little real action to put meaningful prices on carbon has been taken. The level of carbon taxes is also important. Carbon prices at the estimated social cost of global warming caused by carbon emissions would mean a carbon tax of $100 per tonne (or higher) today, increasing to about $1000 per tonne by mid-century. Carbon prices at these levels would likely have a negative impact on the economy. The typical approach to controlling carbon is to start small (a high cap in a cap & trade regime or a low carbon tax) to provide marginal incentives without a negative impact on the economy. A World Bank report (the 2015 update of State and Trends of Carbon Pricing) shows that carbon prices are mostly at or below $20 a tonne. Carbon taxes are uncertain. Nuclear power plant investments require revenue adequacy and certainty for at least the initial 30 years of project operation after the ten-year development and construction period. There is doubt that carbon prices at the level needed for a nuclear power project will be in place for 40 years (or more) into the future. Carbon price regimes are driven by governments. Governments change and government positions change (for example, in Australia), adding uncertainty for any carbon pricing regime over the time frames needed for a nuclear power plant. Carbon prices are likely to be too indirect, too late, too low, and too uncertain to provide real financial support for nuclear power projects. Providing direct benefits to existing and new nuclear power plants would be much more effective than economy-wide, technology-neutral, and politically feasible carbon pricing regimes. The nuclear power industry requires project-specific actions to provide the sufficient and certain revenue needed to keep existing nuclear power plants in operation and to support the development of new nuclear power plants. This approach would involve project-level actions to keep nuclear power plants operating or to build new nuclear power plants with costs of these actions recovered as a cost of reducing carbon. The UK is an example of this approach. It has a legally-binding requirement to lower carbon emissions. Existing carbon control measures, including a carbon price floor and the emissions trading scheme, do not provide the revenue sufficiency and certainty needed for new nuclear power investment in the UK. To get new nuclear power projects built there, the Electricity Market Reform program provided focused incentives for new nuclear power. The cost of Hinkley Point C or other new nuclear project incentives (such as, the difference between the Contract for Difference strike price and the market price of power) is a cost to control carbon that will be recovered from retail utilities in the UK.

## oil

### 2ac – at: da – oil

#### high oil revenue fosters instability

Basedau 14

Matthias Basedau et al., Drilling Deeper: A Systematic, Context-Sensitive Investigation of Causal Mechanisms in the Oil–Conflict Link, 50 The Journal of Development Studies (2014).

‘Causal mechanisms uncover the underlying social processes that connect inputs and outcomes’ (Falleti & Lynch 2009 Gerring, J. (2007). Case study research. principles and practices. Cambridge: Cambridge University Press. , p. 1161; see also George & Bennett, 2005). What, then, are the causal mechanisms underlying the oil–conflict link?11. Unless otherwise indicated, ‘conflict’ refers to ‘internal violent conflict’. View all notes In their seminal work on ‘greed and grievance’, Collier and Hoeffler (1998; 2004) argue that the main mechanism is economic opportunity. Wealth – in the form of primary commodities – increases the likelihood of civil war by providing the opportunity, and the related motive of ‘greed’, for armed rebel activity, rather than spurring conflict-promoting grievances. These ideas have been further developed and modified in the literature.22. For an overview of the literature, see also Le Billon (2012) and Ross (2012). View all notes With regard to causal mechanisms, several different lists of them have been compiled (for example, Humphreys, 2005 Le Billon, P. (2001). The political ecology of war: Natural resources and armed conflict. Political Geography, 20(5), 561–584. [CrossRef], [Web of Science ®], [CSA] ; Le Billon, 2012 López Maya, K. (2007). Las Insurrecciones de la Oposición en 2002 en Venezuela. In G. Maihold (Ed.), Venezuela en Retrospectiva: los Pasos hacia el Régimen Chavista (pp. 179–202). Madrid: Iberoamericana. ; Ross, 2004a Ross, M. (2004b). What do we know about natural resources and civil war? Journal of Peace Research, 41(3), 337–356. [CrossRef], [Web of Science ®] ). These lists differ somewhat, but they generally state that natural resources – and particularly oil – promote violence through three major mechanisms and several sub-mechanisms: (a) motive; (b) opportunity; and (c) indirect mechanisms. The motive mechanism(s): The first main causal mechanism connects oil and other resources and violent conflict through motive. Thus, conflict may arise over how the benefits and costs of resource production are shared between different groups of actors. In order to achieve a higher precision of analysis, the motive mechanism can be divided into three subtypes according to geographical levels – as the actors involved and the scope of their actions vary according to these levels. Hence, we deal with the motive mechanism at the national level if the central government’s control of resources, or the nationwide distribution of revenues, is at the heart of a conflict (Ross, 2006 Ross, M. (2012). The oil curse. How petroleum wealth shapes the development of nations. Princeton, NJ: Princeton University Press. , p. 280). The subnational level comes into play when talking about secessionist or autonomy-related conflicts between resource-producing regions and the central state – or other regions (Le Billon, 2001 Lijphart, A. (1975). The comparable-cases strategy in comparative research. Comparative Political Studies, 8(2), 158–177. [Web of Science ®], [CSA] ). Intercommunal conflicts within resource-producing regions over revenue distribution or the side-effects of resource production are also covered by this mechanism. Finally, conflicts over benefits – not so much costs – from resources may also be promoted by the vested interests of international actors in the resources of the country in question, which make their direct or indirect military intervention in internal conflicts more likely (Humphreys, 2005 Le Billon, P. (2001). The political ecology of war: Natural resources and armed conflict. Political Geography, 20(5), 561–584. [CrossRef], [Web of Science ®], [CSA] ). The opportunity mechanism(s): The second main causal mechanism is based on the assumption that natural resources will provide an opportunity for, or facilitate the feasibility of, warfare – in particular, rebellion. We can identify two subtypes of the opportunity mechanism. First, resources may provide the financial means for rebellion in the sense that rebels gain access to resources and trade them so as to generate the necessary capital for maintaining a rebel group (Collier & Hoeffler, 2004 Collier, P., & Hoeffler, A. (2004). Greed and grievance in civil war. Oxford Economic Papers, 56(4), 563–595. [CrossRef], [Web of Science ®] ). Second, rebels need not necessarily control resource production: resources might provide fruitful military targets, particularly when income from them is critically important to the government. Rebels can attack production sites and sabotage transport facilities; personnel can be kidnapped. The latter action not only boosts military opportunities but also provides a lucrative source of income (Ballentine & Nitzschke, 2003 Ballentine, K., & Nitschke, H. (2003). Beyond greed and grievance: Policy lessons from studies in the political economy of armed conflict. New York: International Peace Academy. ). The indirect mechanism(s): A third key causal mechanism is based on the argument that resources make countries more indirectly vulnerable to the emergence of violence. Again, we are able to propose subtypes, ones mostly inspired by the literature on the ‘rentier state’ and the economy-related ‘resource curse’ (Auty 2001 Auty, R. (Ed.) (2001). Resource abundance and economic development. Oxford: Oxford University Press. ; see also, Le Billon 2012 López Maya, K. (2007). Las Insurrecciones de la Oposición en 2002 en Venezuela. In G. Maihold (Ed.), Venezuela en Retrospectiva: los Pasos hacia el Régimen Chavista (pp. 179–202). Madrid: Iberoamericana. ). In the case of the economic subtype, it is expected that resources will damage economic prospects through the well-known side-effects of resource-dependence: negative price shocks33. In a recent publication, Bazzi and Blattman (2011)– in contrast to earlier studies – find very weak evidence for the widespread hypothesis that income shocks provoke conflict. View all notes ; the ‘Dutch Disease’, when the resource sector crowds out other sectors; the neglect of other sources of income (for example, manufacturing); or the wasting of resource income on economically harmful, prestigious projects. Once resources have contributed to economic crisis, the provision of public goods will become more difficult. As a consequence, violent conflict might become more likely.The institutional variant of the indirect mechanism – also referred to as the weak state mechanism – draws on the concept of the rentier state (Luciani, 1987 Mahoney, J. (2010). After KKV: The new methodology of qualitative research. World Politics, 62(1), 120–147. [CrossRef], [Web of Science ®] ). It argues that resource income represents rents, which foster rent-seeking behaviour, if not outright corruption – which is damaging to the quality of institutions and weakens the state (Fearon, 2005 Gerring, J. (2007). Case study research. principles and practices. Cambridge: Cambridge University Press. ; Fjelde, 2009 Gerring, J. (2007). Case study research. principles and practices. Cambridge: Cambridge University Press. ). There are two principal variants of the weak state mechanism. First, abundant resource income might prevent a government from establishing an effective bureaucracy, with harmful consequences for social welfare and, in turn, internal peace – at least in the long run. Also, weak states will be conducive to rebellion, given their lack of control over their entire territory, and resource-rich regions with (lootable) resources in particular. Second, resources do not always proactively damage the quality of institutions; rather, they are detrimental if they happen to be discovered in countries where institutions are already weak (Mehlum, Moene, & Torvik, 2006 Przeworski, A., and Teune, H. (1970). The logic of comparative social inquiry. Mallaba: Krieger. ).

#### no impact to low oil prices – more likely to increase coop

Gause 15

F. Gregory Gause, Professor of International Affairs at Texas A&M University, Sultans of Swing? The Geopolitics of Falling Oil Prices, April 2015, Brookings, http://www.brookings.edu/~/media/research/files/papers/2015/04/2-falling-oil-prices-gause/falling-oil-prices-english.pdf

Will domestic upheaval and regional war follow from our current period of a drastic fall in oil prices? That is highly unlikely. While salient examples of such dramatic events pop easily to mind when thinking of past periods of low oil prices, the less dramatic fact is that very few oil states actually experienced regime change during oil price declines and that regional wars are as likely to happen when oil prices are high as when they are low. The geopolitical results of the current oil price decline are most likely to be very modest, and in fact might be positive for the United States. The straitened circumstances of all the oil exporters could lead to a reduction in tensions among them, as they explore ways to cooperate in order to prop up the price of oil. That has been a pattern in past periods of oil price decline. Lower oil prices could lead Iran, Saudi Arabia, and Russia to the bargaining table on oil issues, and any agreements they make could reduce the level of geopolitical and sectarian tension in the Middle East more generally. There are no guarantees here, to be sure. The intensity of the Syrian conflict and the sectarian tensions that it has spurred regionally cannot be downplayed. But the possibility exists that all these players in the regional game will be looking to de-escalate their tensions as they are all squeezed by lower oil prices. This could open up a window for creative diplomacy, linking oil talks to broader regional crisis management, which Washington should be ready to exploit.

## politics

### plan bipartisan

#### Plan’s bipart

Kaufman et al. 16

economist for the U.S. Climate Initiative in the Global Climate Program; Michael Obeiter, member of the U.S. Climate Initiative; Eleanor Krause, conducts research and analysis for WRI's Carbon Pricing program through the U.S. Climate Initiative,

(Noah, “PUTTING A PRICE ON CARBON: REDUCING EMISSIONS”, January 2016, <http://admin.indiaenvironmentportal.org.in/files/file/Putting_a_Price_on_Carbon_Emissions.pdf>, Date Accessed: 9-27-16

Congressional action is needed if the United States is to achieve its long-term emissions targets. According to recent polls, well over half of Americans support some form of carbon pricing (RFF 2015; Leiserowitz et al. 2015). Recent federal legislative proposals for carbon pricing policies—including those by Sheldon Whitehouse (D-RI) and Brian Schatz (D-HI) in the Senate, and by Jim McDermott (D-WA) in the House—have all been carbon taxes, at least in part due to the perception that such policies could garner bipartisan support. Indeed, while Republicans almost universally condemn increased EPA regulation and cap-and-trade, a growing number of prominent Republicans have expressed support for a carbon tax because it is consistent with conservative and libertarian principles (Mooney 2015). As we have shown, carbon taxes harness free market forces to achieve emissions reductions. Carbon taxes can also raise revenue to achieve conservative objectives such as reduced taxes and deficits, and they do not require an increase in the size of government.

### revenue neutral t/

#### The revenue neutral component of the plan shields the link

Gordon 16

Deborah, Director of Energy and Climate Programs @ Carnegie, and Jessica Tuchman Mathews, Distinguished Fellow @ Carnegie, “A Smart Tax: Pricing Oil for a Safe Climate, “June 15, http://carnegieendowment.org/2016/06/15/smart-tax-pricing-oil-for-safe-climate-pub-63765, Date Accessed: 9-27-16

Political, as well as economic, considerations argue strongly that the tax or fee be revenue neutral: that is, that all of its revenues are immediately and directly returned to the economy. Revenue neutrality has two great advantages. It minimizes the impacts of the tax beyond the targets at which it is aimed. And, it will greatly ease the path to enactment. Once opened to the political process, the lure of the tens of billions in potential revenue from a carbon tax will set off an unending contest for shares of its proceeds. There are any number of deserving purposes to which these could be put. Each of them has fierce proponents, many with large sums to spend on lobbying for their desired outcome. Only the discipline of a fixed boundary can avoid sinking the measure in a sea of competing priorities. While revenue neutrality avoids one set of political battles, a closely related one remains in the matter of how the revenues are returned to the economy and to whom. There are an almost infinite number of possibilities. In our view, whatever formula is adopted must meet two criteria: it must be simple and transparent to the American public, and it must be equally attractive to both political parties. This standard would be met, for example, by allocating the revenues to just two purposes—cutting the corporate income tax to stimulate economic growth, and preventing any worsening of economic inequality by reimbursing poor and middle-income families for the added cost of their oil.

### big oil

#### Big oil will push for the plan – shields the link

Bloomberg 15

Bloomberg Editorial Board, “Even Big Oil Wants a Carbon Tax,” June 1, https://www.bloomberg.com/view/articles/2015-06-01/even-big-oil-wants-a-carbon-tax, Date Accessed: 9-27-16

Now that six of the world's largest oil companies have essentially come out in favor of a carbon tax, it's getting harder to dismiss the idea as some kind of outlandish lefty plot. And those companies can help their cause by engaging Congress directly, instead of outlining their case in a polite letter to the United Nations. None of the companies -- BP Plc, Royal Dutch Shell Plc, Total SA, Statoil ASA, Eni SpA and BG Group -- is based in the U.S. Still, their argument should resonate in Washington: "Clear, stable, long-term" policies that make carbon more expensive (the letter never uses the word "tax") are necessary to reduce uncertainty, stimulate investment and encourage the most efficient reductions in emissions. Only governments can make those changes, they say. And those national systems must eventually be connected to create a global system. That's the right approach, and it's not surprising that oil producers are advocating it. The current strategy for reducing emissions of carbon dioxide and other greenhouse gases isn't nearly enough to prevent potentially devastating changes to the Earth's climate. As the need intensifies for a more ambitious response, so does the challenge these companies face in planning for them. And the longer those remedies are delayed, the more aggressive they'll need to be. There are two broad arguments against pricing carbon. One is that climate change is exaggerated, or at least unproven, so a carbon tax is unnecessary. The second is to concede that climate change is real but that a carbon tax or similar approach would be too disruptive. In their letter, sent to the head of the UN Framework Convention on Climate Change in advance of its meeting in December, the oil companies reject the first claim outright and answer the second. They also pledge to work for a change in policy "in our meetings with ministers and government representatives." In other words: Their lobbying will consist of more than a letter-writing campaign, which is hardly news. Shell spent almost $15 million in the 2012 election cycle, according to the Center for Responsive Politics, while BP spent $9 million. If Big Oil wants to change the direction of U.S. climate policy, it's safe to say it can. One example: There is legislation that would impose a price on carbon starting at $42 per ton. Big Oil could use its clout to advance the bill in Congress and advocate for the idea in the public debate. It's not as if the opposition to a tax is especially stubborn. A poll last year found that while two-thirds of voters oppose a straight carbon tax, 56 percent approve if its revenue is rebated to the public. And if the money it raised were used to fund research into renewable energy, 60 percent approve -- including a majority of Republicans. It's becoming increasingly clear that voters and companies alike are ready for a carbon tax. Nobody wins by waiting.

## trade

### at: impact

**trade doesn’t prevent war – their studies have been disproven by subsequent empirical work**

Miller 14

Charles, lecturer at Australian National University’s Strategic and Defence Studies Centre, 4/7/14, “Globalisation and war,” http://www.aspistrategist.org.au/globalisation-and-war/, Date Accessed: 9-27-16

John O’Neal and Bruce Russett’s work is perhaps the best known in this regard—and Steven Pinker cites them approvingly in his book The Better Angels of Our Nature. Analysing trade and conflict data from the nineteenth to the twenty-first centuries, they found that trade flows do have a significant impact in reducing the chances of conflict, even when taking a variety of other factors into account. But their conclusions have in turn been questioned by other scholars. For one thing, their model failed to take three things into account. First, it’s quite possible that peace causes trade rather than the other way around—no company wants to start an export business to another country if it anticipates that business linkages will be cut off by war further down the line. Second, conflict behaviour exhibits what’s called ‘network effects’— if France and Germany are at peace, chances are Belgium and Germany will be too. And third, both the likelihood of conflict and the level of trade are influenced by the number of years a pair of countries has already been at peace—because prolonged periods of peace increase mutual trust. Take any of these factors into account, and studies have shown (here and here) that the apparent relationship between trade flows and peace disappears. Perhaps, though, conceiving of globalisation solely in terms of trade flows is mistaken. Alternative indicators of globalisation include foreign direct investment, financial openness and the levels of government intervention in economic relations with the rest of the world. Data on those variables is less extensive than on trade flows, usually dating back only to the post World War II period. But some analysts, such as Patrick McDonald and Erik Gartzke, have argued that a significant correlation can be found between them and a reduction in the probability of conflict. Those findings, newer than O’Neal and Russett’s, haven’t yet been subjected to the same intense scrutiny, so may in turn be qualified by future research. What does all that mean for the policy-maker? The statistical evidence certainly doesn’t tell us that globalisation has made war in East Asia impossible. ‘Cromwell’s law’ counsels us that a logically conceivable event should never be assigned a probability of zero. The most we could conclude is that globalisation has made such an occurrence much less likely. There’s some hopeful numerical evidence that globalisation does indeed have that effect, but the evidence isn’t so compelling that we can substitute an economic engagement policy for a security policy. By all means, let’s continue to promote trade in the Asia-Pacific. But we should also continue to be prepared for scenarios which are unlikely but would be hugely