**The Aff does not endorse or defend any offensive representations, words, ideas, or otherwise exclusionary discourse, and we have done our best to remove any such elements from our case. We act purely as a neutral, open-minded analysis of climate change. If any aspect of the 1AC does not meet this standard, we apologize and will be happy to remove it after the round.**

# Plan

#### Plan: The United States federal government should expand climate change cooperation with the People’s Republic of China through

#### involving private sector partners in joint ventures for renewable energy development and

#### coordinating efforts to reduce CO2 emissions through increased dialogue in bilateral initiatives including the U.S.-China Climate Change Working Group and the U.S.-China Clean Energy Research Center.

# Contention 1: The Status Quo

#### Recent multilateral discussion and action on climate change is a good start but not enough – Paris agreements are meaningless unless stronger action takes place.

Upton 10/5 Upton, John. "Landmark Paris Climate Pact to Take Effect in 30 Days." Climate Central: A Science & News Organization. Climate Central, 5 Oct. 2016. Web. 06 Oct. 2016. John Upton is a Senior Science Writer at Climate Central. He is focused on shores and rising seas, and he also covers global climate policy, oceans research and wood energy. Upton has science and business degrees and a decade of international reporting experience. He has written for the New York Times, Slate, Nautilus, VICE, Grist, Pacific Standard, Modern Farmer, and Audubon magazine. // VS

Moving with a diplomatic haste rivaling the rapid recent rise in global temperatures, the European Union on Wednesday joined dozens of countries in signing onto a United Nations climate treaty, pushing it to within a month of taking legal force. Following the filing of paperwork in recent weeks by 73 countries, collectively responsible for 57 percent of annual climate emissions, a key threshold for the Paris agreement was passed Wednesday. The U.N. said the treaty will take effect Nov. 4. This gives us the best possible shot to save the one planet we’ve got,” President Obama said in a televised address Wednesday. “If we follow through on the commitments that this Paris agreement embodies, history may well judge it as a turning point for our planet.” The agreement was finalized less than a year ago, following five years of contentious efforts to push global climate policy in an untested direction following the collapse of UN negotiations in Copenhagen in 2009. “None of us who have been close to this process ever anticipated that this agreement would become official so quickly,” said Heather Coleman, climate change policy manager at the nonprofit Oxfam America. “What it shows is that world leaders understand the urgency of the problem.” The rapid ratification of the agreement suggests nations may finally be nearly united in being eager to tackle an existential threat that has been building since the dawn of the Industrial Age. **The voluntary nature of the pact, however, offers few assurances that it will succeed.** **Even if all countries live up to their pledges under the agreement to tackle rising levels of greenhouse gas pollution, projections show warming will fail to be kept to well below 2°C (3.6°F) compared with preindustrial times — which is a key goal of the pact**. **Future work to tighten pledges will be key to the treaty’s success.** Recent years have seen China, [and] the U.S. and India reverse decades of resistance to joining Europe in its fight against global warming. The reversals have come amid plummeting clean energy prices and rising global temperatures. They helped assure leaders of smaller countries that their own efforts to tackle warming would not be futile. A warming spurt followed a lull in surface warming from 2001 until 2014, and 2016 is set to be the hottest on record globally, beating records set each of the two prior years. Earth’s surface is more than 1°C (1.8°F) warmer than it was in the early 18th century, worsening storms, droughts and heat waves and causing seas to rise. Wednesday’s announcement by the U.N. means countries that have signed onto the pact will have more power than others over decision making during global climate talks in Marrakesh next month. It also means the pact will become the law of the land in the U.S. before Donald Trump, a Republican who has called climate change a “hoax,” could become president. If he wins in November, Trump would have plenty of options for backing America out of the agreement, but now it would be more difficult for him to do so. “There is virtually unanimous international sentiment that it’s important for the agreement to come into force before inauguration day, in case Trump is elected,” said Harvard professor Robert Stavins, director of the Harvard Project on Climate Agreements. The Paris agreement compels national governments to be transparent about their greenhouse gas emissions and it invites them to work ambitiously to reduce them. It formally covers a period beginning in 2020, but many of the efforts outlined in the agreement have already begun. Unlike the last global climate treaty, the Kyoto protocol, which failed to meaningfully slow climate change after it was finalized in the 1990s, the new agreement emphasizes voluntary efforts by all countries to tackle global warming — not just rich ones. The U.S. never signed on to the Kyoto protocol. Canada backed out after an oil boom made it impossible for it to comply by pushing up its pollution rates. Developing countries were not affected by its mandated greenhouse gas pollution reductions. “There’s much more and much broader enthusiasm for the Paris agreement than there was for the Kyoto protocol,” Stavins said. “**The Paris agreement is practical and meaningful** — rather than aspirational and symbolic.” Unlike the Kyoto protocol, the Paris agreement threatens no penalties against countries that fail to reach their targets for reducing or slowing their impacts on the climate. The new approach is based on the idea that governments will set more ambitious targets for slowing climate change if they don’t fear being penalized for failure. The U.S. pledged under the Paris agreement to reduce its greenhouse gas emissions by a little more than a quarter by 2025, compared with 2005. Rules and plans put in place by the Obama Administration to slow global warming fall well short of the measures needed to keep that promise, meaning the next president would need to introduce new rules or tighten existing ones. The European Union pledged a 40 percent reduction by 2030, compared with 1990. China pledged its annual emissions would stop rising after 2030 — though it appears to have already lived up to that promise. Other countries set their own targets, such as slowing deforestation and installing solar farms. Under the agreement, rich countries pledged $100 billion a year to help poorer ones grow their economies using clean energy. With countries like India relying heavily on polluting power sources as they rapidly grow their economies, fears that the West could fail to deliver on its promises of assistance could doom hopes for the treaty’s success. “Finance and technology are the two things that we’re really desperately looking for,” said Aditya Pundir, manager of the Indian branch of the nonprofit Climate Reality Project. “The biggest help the country can get today is if we can get the right amount of finance.”

**United States and PRC are willing to work together on climate change and have mutual objectives – it’s only a matter of forming concrete proposals to carry out under this framework, such as the plan.**

AAP 9/10 AANews. Asian American Press. "Http://aapress.com/ethnicity/chinese/us-china-reach-cooperation-agreement-on-climate-change/." Http://aapress.com/ethnicity/chinese/us-china-reach-cooperation-agreement-on-climate-change/. Asian Business & Community Publishing, Inc., 10 Sept. 2016. Web. 07 Oct. 2016. // VS

WASHINGTON, D.C. (Sept. 3, 2016) — The White House Office of the Press Secretary on Sept. 3 announced that the United States and China formally joined the Paris Agreement in a ceremony in Hangzhou, China. President Barack Obama and President Xi Jinping deposited each country’s official instrument to join the agreement with United Nations Secretary General Ban-Ki Moon. The announcement marks another milestone in President Obama and President Xi’s legacy of climate leadership and represents a significant step towards the Paris Agreement entering into force this year. The leaders also affirmed their commitment to work together to reach successful outcomes this year in adopting an ambitious amendment to the Montreal Protocol to phase down HFCs and on a market-based measure to reduce carbon emissions from international aviation, and announced continued bilateral climate cooperation and domestic action. · Paris Agreement. Last December, more than 190 countries adopted the Paris Agreement, the most ambitious climate change agreement in history. In order for the agreement to take effect and enter into force, at least 55 countries representing at least 55 percent of global emissions need to formally join the Agreement. Today’s action by the United States and China to formally join is a significant step towards entry into force this year with countries representing around 40 percent of global emissions having now joined and more than 55 countries having already joined or publicly committed to work towards joining the agreement this year. In addition, both sides stated their intention to prepare and publish their respective “mid-century, long-term low greenhouse gas emission development strategies” under the Paris Agreement. The United States has previously committed to publishing its strategy this year, and today, China committed to prepare its strategy as early as possible. And the two countries also announced that **they will engage in technical collaboration and consultation on their strategies.** · HFC Amendment to the Montreal Protocol**.** President Obama and President Xi first underscored the need to phase down the consumption and production of super-polluting hydrofluorocarbons (HFCs), which can be up to 10,000 times more potent than carbon dioxide, in their meeting at Sunnylands in 2013. In their statement on March 31 this year, they called for a successful outcome in 2016 on an amendment to the Montreal Protocol to phase down the consumption and production of HFCs globally. Today, the United States and China are making their joint goal of a successful outcome more concrete by committing to work together to reach agreement this year on an ambitious and comprehensive HFC amendment with an early freeze date and ambitious phase down schedule, along with increased financial support to assist in implementation. An early freeze date is a critical determinant of an amendment’s ambition, including whether it can avoid up to 0.5 degrees Celsius of warming by the end of the century. · International Aviation Emissions. In March 2016, President Obama and President Xi committed to working together to reach a successful outcome this year on a global market-based measure for addressing greenhouse gas emissions from international aviation at the International Civil Aviation Organization (ICAO). After close bilateral engagement between the United States and China, as well as constructive multilateral negotiations among ICAO’s member States, the ICAO Assembly will consider the approval of such a measure when it meets in late September. Today, the United States and China are expressing their support for the ICAO Assembly reaching consensus on such a measure. The measure under consideration would be implemented with an initial period in which countries volunteer to join. The United States and China also announced that they expect to be early participants in the measure and volunteer to join, a clear demonstration of leadership by the two largest emitters of international aviation emissions and a signal to others to follow suit. · Domestic Actions.As they did in the September 2015 announcement, the United States and China highlighted actions that each side is taking domestically to tackle climate change and promote the transition towards low-carbon and climate-resilient economies. The United States highlighted actions including the extension of the production and investment tax credits for wind and solar, which will deploy roughly 100 gigawatts of renewable energy over the next five years, new fuel efficiency standards for heavy-duty vehicles, and efforts to finalize 20 additional efficiency standards for appliances and equipment by the end of the year. Likewise, China highlighted plans to reduce CO2 and energy intensity by 18 percent and 15 percent, respectively, as well as to increase the share of non-fossil fuels in primary energy consumption to 15 percent by 2020. China also noted its commitment to start its national cap-and-trade program in 2017 and to promote green power dispatch to accelerate the use of renewable energy. · Continued Bilateral Cooperation.The United States and China committed to deepen and enhance their ongoing bilateral climate cooperation, which has been a core element of climate action by the two countries and has provided the foundation for leadership in the international climate arena. **The two sides plan to continue this cooperation in the years to come through a number of frameworks, including the U.S.-China Climate Change Working Group, and the U.S.-China Clean Energy Research Center (CERC**). Looking ahead the two countries look forward to the next U.S.-China Climate-Smart / Low-Carbon Cities Summit, to be held in Boston in 2017, as well as the Clean Energy Ministerial, to be held in China in 2017. U.S.-China Climate Change Cooperation Outcomes President Barack Obama and President Xi Jinping have forged a historic partnership between the United States and China to lead in combatting climate change. From the Sunnylands meeting in 2013, to the landmark November 2014 Joint Announcement on Climate Change and the September 2015 and March 2016 Joint Presidential Statements on Climate Change, leadership by the United States and China has galvanized global action to build a green, low-carbon, and climate-resilient world and was a major contributor to achieving the historic Paris Agreement. Climate change has formed a central pillar of the bilateral relationship between the two countries. Both sides are committed to implementing the three presidential joint statements on climate change and will continue to deepen and broaden bilateral climate change cooperation, building on the concrete progress and productive outcomes achieved thus far. Today, the United States and China deposited with United Nations Secretary-General Ban Ki-moon their respective instruments to join the Paris Agreement, marking a significant contribution towards the early entry into force of the Paris Agreement. The two Presidents call on all other Parties to the United Nations Framework Convention on Climate Change to join the Paris Agreement as early as possible with the expectation of the Agreement’s entry into force this year. The Presidents further express their continued commitment to work together and with others to promote the full implementation of the Paris Agreement. The United States and China will formulate and publish their respective strategies for mid-century, low-greenhouse gas emission development. The United States will release its strategy in 2016, and China will do so as early as possible. The two countries agree to hold a series of technical exchanges on the formulation of such strategies, beginning this year. The United States and China are committed to working bilaterally and with other countries to advance the post-Paris negotiation process and to achieve successful outcomes this year in related multilateral fora. The United States and China commit to work together and with others to reach agreement this year on an ambitious and comprehensive HFC amendment to the Montreal Protocol, including an early first reduction step and early freeze date for Article 2 and Article 5 Parties respectively and an ambitious phase-down schedule, with increased and adequate financial support from Article 2 Parties to help Article 5 Parties with their implementation. The United States and China also intend to work together on critical research regarding the safe use of flammable alternatives and commit to collaborate on enhanced domestic action to reduce use of HFCs, improve efficiency standards, support policies to transform the air conditioning market, and remain active participants in the Clean Energy Ministerial’s Advanced Cooling Challenge. The two sides welcome the decision of the ICAO Council to forward to the ICAO Assembly its recommended Resolution on a global market-based measure to address carbon emissions from international aviation. Recognizing the important role of international aviation in addressing climate change, the United States and China support the ICAO Assembly to reach consensus on a global market-based measure this October, and expect to be early participants in such measure. The two Presidents celebrate the achievements of the U.S.-China Climate Change Working Group (CCWG) and U.S.-China Clean Energy Research Center (CERC) in recent years and commit to further enhance bilateral cooperation on climate change under these and other frameworks. They welcome the success of the U.S.-China Climate-Smart/Low-Carbon Cities Summits in 2015 and 2016 and look forward to the next summit, to be held in Boston, the United States, in 2017, as well as the next Clean Energy Ministerial to be hosted by China in 2017. The United States and China commit to continue taking ambitious domestic action to further promote the transition towards green, low-carbon and climate-resilient economies both domestically and internationally. In the United States’ power sector, a five-year extension of production and investment tax credits for wind and solar energy will deploy roughly 100GW of renewable energy over the next five years, and the United States has paused new coal leasing on federal lands, while undertaking a comprehensive review of the federal coal program, which makes up roughly 40% of United States coal supply. In the transportation sector, the United States has finalized efficiency standards for heavy-duty vehicles, which will reduce more than 1 billion tons of carbon pollution over the life of the program. In the building sector, the United States is on track to finalize 20 additional efficiency standards for appliances and equipment by the end of the year, which will contribute to achieving its goal of cutting 3 billion metric tons of carbon pollution from such standards. With respect to non-CO2 emissions, the United States finalized this year measures to reduce domestic HFCs and methane from the oil and gas and landfill sectors. China is making great efforts to advance ecological civilization and promote green, low-carbon, climate resilient and sustainable development. During the 13th Five-Year Period (2016-2020), China will lower its carbon dioxide per unit of GDP and energy consumption per unit of GDP by 18% and 15% respectively, increase the share of non-fossil fuels in primary energy consumption to 15% and increase the forest stock volume by 1.4 billion cubic meters, as concrete and crucial steps towards implementing its nationally determined contribution. China will continue its efforts to increase energy efficiency in industries, transportation and buildings, promote green power dispatch to accelerate the development of renewable energy, start in 2017 its national emission trading system and phase down the production and consumption of HFCs. China will also promote low-carbon development of transportation by developing standard modern transportation equipment and energy-efficient, environmentally-friendly means of transport. Internationally, as part of an ongoing commitment to strengthen low-carbon policies, in 2015 the United States worked with other OECD member countries to adopt new OECD guidelines to limit export finance for overseas coal-fired power plants. The United States also remains committed with other developed countries to the goal of jointly mobilizing 100 billion US dollars per year by 2020 to address the needs of developing countries in the context of meaningful mitigation and adaptation action. This funding will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance. China is taking concrete steps to strengthen green and low-carbon policies and regulations with a view to strictly controlling public investment flowing into projects with high pollution and carbon emissions both domestically and internationally.

# Contention 2: Climate Change

#### Climate change is real and anthropogenic – any rejection of this phenomenon is a result of climate illiteracy.

Cook, John, et al. "Consensus on consensus: a synthesis of consensus estimates on human-caused global warming." Environmental Research Letters 11. April (2016): 048002. http://iopscience.iop.org/article/10.1088/1748-9326/11/4/048002

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 green-house 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. Tol (2016) reports consensus estimates ranging from 7% to 100% from the same studies described above. His broad range is due to sub-groupings of scientists with different levels of expertise. For example, the sub-sample with 7% agreement was selected from those expressing an ‘unconvinced’ position on AGW (Verheggen et al 2014). This selection criterion does not provide a valid estimate of consensus for two reasons: first, this subsample was selected based on opinion on climate change, pre- determining the level of estimated consensus. Second, this does not constitute a sample of experts, as non-experts were included. Anderegg (2010) found that nearly one-third of the unconvinced group lacked a PhD, and only a tiny fraction had a PhD in a climate-relevant discipline. Eliminating less published scientists from both these samples resulted in consensus values of 90% and 97%–98% for Verheggen et al (2014) and Anderegg et al (2010), respectively. Tol’s (2016) conflation of unrepresentative non-expert sub-samples and samples of climate experts is a misrepresentation of the results of previous studies, including those published by a number of coauthors of this paper. In addition to varying with expertise, consensus estimates may differ based on their approach to studies or survey responses that do not state an explicit position on AGW. Taking a conservative approach, C13 omitted abstracts that did not state a position on AGW to derive its consensus estimate of 97%; a value shown to be robust when compared with the estimate derived from author responses. In contrast, in one analysis, Tol (2016) effectively treats no-position abstracts as rejecting AGW, thereby deriving consensus values less than 35%. Equating no-position papers with rejection or an uncertain position on AGW is inconsistent with the expectation of decreasing reference to a consensual position as that consensus strengthens (Oreskes 2007, Shwed and Bearman 2010). Powell (2015) shows that applying Tol’s method to the established paradigm of plate tectonics would lead Tol to reject the scientific consensus in that field because nearly all current papers would be classified as taking ‘no position’.¶ 4. Conclusion¶ We have shown that the scientific consensus on AGW is robust, with a range of 90%–100% depending on the exact question, timing and sampling methodology. This is supported by multiple independent studies despite variations in the study timing, definition of consensus, or differences in methodology including surveys of scientists, analyses of literature or of citation networks. Tol (2016) obtains lower consensus estimates through a flawed methodology, for example by conflating non-expert and expert views, and/or making unsupported assumptions about sources that do not specifically state a position about the consensus view.¶ An accurate understanding of scientific consensus, and the ability to recognize attempts to undermine it, are important for public climate literacy. Public perception of the scientific consensus has been found to be a gateway belief, affecting other climate beliefs and attitudes including policy support (Ding et al 2011, McCright et al 2013, van der Linden et al 2015). However, many in the public, particularly in the US, still believe scientists disagree to a large extent about AGW (Leiserowitz et al 2015), and many political leaders, again particularly in the US, insist that this is so.¶ Leiserowitz et al (2015) found that only 12% of the US public accurately estimate the consensus at 91%– 100%. Further, Plutzer et al 2016 found that only 30% of middle-school and 45% of high-school science teachers were aware that the scientific consensus is above 80%, with 31% of teachers who teach climate change presenting contradictory messages that emphasize both the consensus and the minority position.¶ Misinformation about climate change has been observed to reduce climate literacy levels (McCright et al 2016, Ranney and Clark 2016), and manufacturing doubt about the scientific consensus on climate change is one of the most effective means of reducing acceptance of climate change and support for mitigation policies (Oreskes 2010, van der Linden et al 2016). Therefore, it should come as no surprise that the most common argument used in contrarian op-eds about climate change from 2007 to 2010 was that there is no scientific consensus on human-caused global warming (Elsasser and Dunlap 2012, Oreskes and Conway 2011). The generation of climate misinformation persists, with arguments against climate science increasing relative to policy arguments in publications by conservative organisations (Boussalis and Coan 2016).¶ Consequently, it is important that scientists communicate the overwhelming expert consensus on AGW to the public (Maibach et al 2014, Cook and Jacobs 2014). Explaining the 97% consensus has been observed to increase acceptance of climate change (Lewandowsky et al 2013, Cook and Lewandowsky 2016) with the greatest change among conservatives (Kotcher et al 2014).¶ From a broader perspective, it doesn’t matter if the consensus number is 90% or 100%. The level of scientific agreement on AGW is overwhelmingly high because the supporting evidence is overwhelmingly strong.

#### Human emissions are the largest driver of climate change – no alt causes.

Climate Central 14 (Climate Central is a nonprofit news organization that analyzes and reports on climate science. Composed of scientists and science journalists, the organization conducts scientific research on climate change and energy issues, and produces multimedia content; “Rising Global Temperatures and CO2”; May 6th, 2014; http://www.climatecentral.org/gallery/graphics/co2-and-rising-global-temperatures; DT)

The average global temperature fluctuates every year. However, when you look at a snapshot of the global temperature trend, it's on the rise - particularly since 1970. The main cause? Carbon dioxide and other greenhouse gas emissions from human activities. There are plenty of factors that influence temperatures in different regions across the globe. El Niño is one of the biggest drivers of year-to-year variability, increasing the likelihood of warm weather in the Pacific Northwest and cooler weather in the Southeast as well as a host of other global impacts. Longer-term fluctuations such as the Pacific Decadal Oscillation and aerosols from natural and human sources can further affect regional climate. Solar cycles also have global temperature implications, although on a much smaller scale. These shifts taken individually and together account for the year-to-year variability seen in the global average temperatures. They can’t fully explain why the globe has warmed about 1.6°F since 1880, though. Overlaying the amount of carbon dioxide in the atmosphere shows a clear correlation with that rise in temperatures. Of course correlation doesn’t always equal causation. However, reams of peer-reviewed research, basic physics, the ability to track the specific chemical fingerprint of fossil fuel-driven carbon, and the fact that no models can replicate this century's warming without pumping up carbon dioxide and other greenhouse gases in the atmosphere give scientists confidence that human carbon emissions are driving the globe’s temperature higher. Other indicators such as ocean acidification, increasing deep ocean heat, melting ice and permafrost, shrinking snow pack, and sea level rise further make the case that the additional carbon dioxide is affecting the global climate system. There are periods when other factors might temporarily slow that rise such as the much-discussed global warming “pause” of the last decade, but the overall connection is clear. If greenhouse gas emissions continue to rise, the globe’s average temperature is projected to follow suit. The worst-case emissions scenario, the track that we are currently on, estimates a rise in temperature of 4.7° to 8.6°F by 2100. International negotiators are at a meeting in Warsaw that continues through November 22 in an effort to lay the groundwork for a global climate treaty that aims to limit the temperature from rising more than 3.6°F above pre-industrial levels.

#### The status quo results in runaway warming from positive feedback loops that guarantees extinction within 100 years – it exacerbates conflicts from resource scarcity as well as economic collapse.

Jamail, Dahr. "Mass Extinction: It's the End of the World as We Know It." truth-out.org. N.p., 6 July 2015. Web. 21 June 2016. <http://www.truth-out.org/news/item/31661-mass-extinction-it-s-the-end-of-the-world-as-we-know-it>.

Guy McPherson is a professor emeritus of evolutionary biology, natural resources and ecology at the University of Arizona, and has been a climate change expert for 30 years. He has also become a controversial figure, due to the fact that he does not shy away from talking about the possibility of near-term human extinction. While McPherson's perspective might sound like the stuff of science fiction, there is historical precedent for his predictions. Fifty-five million years ago, a 5-degree Celsius rise in average global temperatures seems to have occurred in just 13 years, according to a study published in the October 2013 issue of the Proceedings of the National Academy of Sciences. A report in the August 2013 issue of Science revealed that in the near term, **earth's climate will change 10 times faster than during any other moment in the last 65 million years.** McPherson fears that **we are well along in the process of causing our own extinction.** Prior to that, the Permian mass extinction that occurred 250 million years ago, also known as the "Great Dying," was triggered by a massive lava flow in an area of Siberia that led to an increase in global temperatures of 6 degrees Celsius. That, in turn, caused the melting of frozen methane deposits under the seas. Released into the atmosphere, those gases caused temperatures to skyrocket further. All of this occurred over a period of approximately 80,000 years. **The change in climate is** thought to be the key to what caused the extinction of most species on the planet. In that extinction episode, it is estimated that 95 percent of all species were wiped out. Today's current **scientific** and observable evidence strongly suggests we are in the midst of the same process - only this time it is anthropogenic, and happening exponentially faster than even the Permian mass extinction did. In fact, a recently published study in Science Advances states, unequivocally, that the planet has officially entered its sixth mass extinction event. The study shows that **species are already being killed off at rates much faster than they were during the other five extinction events**, and warns ominously that **humans could very likely be among the first wave of species to go extinct.** So if some feel that McPherson's thinking is extreme, when the myriad scientific reports he cites to back his claims are looked at squarely and the dots are connected, the perceived extremism begins to dissolve into a possible, or even likely, reality. The idea of possible human extinction, coming not just from McPherson but a growing number of scientists (as well as the aforementioned recently published report in Science), is now beginning to occasionally find its way into mainstream consciousness. **Humans will be extinct in 100 years because the planet will be uninhabitable, according to Australian microbiologist Frank Fenner**, one of the leaders of the effort to eradicate smallpox in the 1970s. He blames overcrowding, denuded resources and climate change. Fenner's prediction is not a sure bet, but he is correct that there is no way emissions reductions will be enough to save us from our trend toward doom. And there doesn't seem to be any big global rush to reduce emissions, anyway. McPherson, who maintains the blog "Nature Bats Last," told Truthout, "We've never been here as a species and the implications are truly dire and profound for our species and the rest of the living planet." Truthout first interviewed **McPherson in early 2014**, at which time he **had identified 24 self-reinforcing positive feedback loops triggered by human-caused climate disruption. Today that number has grown to more than 50, and continues to increase.** A self-reinforcing positive feedback loop is akin to a "vicious circle": It accelerates the impacts of anthropogenic climate disruption (ACD). An example would be methane releases in the Arctic. Massive amounts of methane are currently locked in the permafrost, which is now melting rapidly. As the permafrost melts, methane - a greenhouse gas 100 times more potent than carbon dioxide on a short timescale - is released into the atmosphere, warming it further, which in turn causes more permafrost to melt, and so on.As soon as this summer, we are likely to begin seeing periods of an ice-free Arctic. (Those periods will arrive by the summer of 2016 at the latest, according to a Naval Postgraduate School report.) Once the summer ice begins melting away completely, even for short periods, methane releases will worsen dramatically. Is it possible that, on top of the vast quantities of carbon dioxide from fossil fuels that continue to enter the atmosphere in record amounts yearly, **an increased release of methane could signal the beginning of the** sort of process that led to the **Great Dying**?McPherson, like the scientists involved in the recent study that confirms the arrival of the sixth great extinction, fears that the situation is already so serious and **so many self-reinforcing feedback loops are already in play that we are well along in the process of causing our own extinction.** Furthermore, McPherson remains convinced that it could happen **far more quickly than generally believed possible** - in the course of just the next few decades, or even sooner. Truthout caught up with McPherson in Washington State, where he was recently on a lecture tour, sharing his dire analysis of how far along we already are regarding ACD. Dahr Jamail: How many positive feedback loops have you identified up until now, and what does this ever-increasing number of them indicate? Guy McPherson: I can't quite wrap my mind around the ever-increasing number of self-reinforcing feedback loops. A long time ago, when there were about 20 of them, I believed evidence would accumulate in support of existing loops, but we couldn't possibly identify any more. Ditto for when we hit 30. And 40. There are more than 50 now, and the hits keep coming. And **the evidence for existing feedback loops continues to grow.** In addition to these positive feedback loops "feeding" within themselves, they also interact among each other. Methane released from the Arctic Ocean is exacerbated and contributes to reduced albedo [reflectivity of solar radiation by the ice] as the Arctic ice declines. Tack on the methane released from permafrost and it's obvious we're facing a shaky future for humanity. You talk often about how when major industrial economic systems collapse, this will actually cause a temperature spike. Please explain, in layperson's terms, how this occurs. Industrial activity continually adds reflective particles into earth's atmosphere. Particularly well known are sulfates produced by burning coal ("clean coal" has a lower concentration of sulfates than "dirty coal"). These particles reflect incoming sunlight, thus artificially cooling the planet. These reflective particles constantly fall out of the atmosphere, but industrial activity continuously adds them, too. When industrial activity ceases, all the particles will fall out within a few days. As a result, earth will lose its "umbrella" and rapid warming of the planet will ensue. According to a 2011 paper by James Hansen and colleagues, the warming will add 1.2 plus or minus 0.2 degrees Celsius. Subsequent research indicates the conservative nature of this paper, suggesting termination of industrial activity will add a minimum of 1.4 degrees Celsius to the global average temperature. What indicators are you seeing that show the possibility of major economic collapses in the near future? **We cannot sustain the unsustainable forever, and this version of civilization is the least sustainable of them all. It teeters on the brink, and many conservative voices have predicted economic collapse this year or next.** According to a June 2012 report by David Korowicz for the Feasta group**, a disruption of supply will trigger collapse of the world's industrial economy in as little as three weeks.** The supply disruptions to which Korowicz refers include water, food and oil. We can add financial credit to the list. In other words, credit could dry up as it nearly did in late 2008. Or the bond markets could trigger hyperinflation. California could have insufficient water to grow enough food to support much of the US, and not long from now. The list goes on. Go into detail about what you're seeing as far as indications of abrupt climate change. When I'm in the midst of a speaking tour, as I am now, I deliver a presentation approximately every day. Lately, I include a [different] indication of abrupt climate change [in] each presentation. In other words, I've been coming across evidence every day. Recent examples include the June 19, 2015, paper in Science Advances: We are in the midst of the sixth great extinction. According to the abstract, the "sixth mass extinction is already under way." The lead author, in an interview, said, "life would take many millions of years to recover, and our species itself would likely disappear early on." According to data from The Cryosphere Today, Arctic ice extent declined 340,000 square kilometers between June 17 and 18, 2015. Such an event is unprecedented. We could witness an ice-free Arctic by September of this year for the first time in human history. How much temperature increase, over what period of time? **Depending upon the timing of economic collapse and release of the 50-gigaton burst of methane Natalia Shakhova warns about, earth could warm an additional 3 degrees Celsius within 18 months.** The relatively slow rate of planetary warming we're seeing so far exceeds the ability of organisms to adapt by a factor of 10,000, according to a paper in the August 2013 edition of Ecology Letters. We depend upon a living planet for our survival. We're killing non-human species at an astonishing rate. To believe we're clever enough to avoid extinction is pure hubris. Is there an historical precedent for this phenomenon? There is no historical precedent for ongoing planetary warming. We're dumping carbon into the atmosphere at a rate faster than the Great Dying from about 250 million years ago. That time, nearly all life on earth was driven to extinction. What does this mean for humans? How do we cope and survive? Astonishingly, against cosmological odds, you and I get to live. But not forever. And not much longer. Coping with the reality of abrupt climate change and human extinction is hardly an easy undertaking. The message I've been delivering for several years is a heavy burden. I suggest fully absorbing the message that we get to live! Part of the process of living is death. In addition to my latest book [Extinction Dialogs], co-authored by Carolyn Baker, I've developed other means for dealing with reality. Among these are a book for young adults co-authored by Pauline Schneider and a workshop co-developed and facilitated by Ms. Schneider. We signed a contract for the book in mid-June and the workshop is described at onlyloveremains.org. What are some events of late you can point to as evidence that we are already experiencing abrupt climate change? In addition to the information presented above, there's the ongoing collapse of the Larsen ice shelves in Antarctica, abundant evidence we're headed for a warmer year than 2014 (the hottest year in history), and numerous extreme weather events. These ongoing phenomena have been anticipated for years. And now, they're here. What are other factors you feel people should be aware of? We're in serious human-population overshoot. **We're driving to extinction at least 150 species each day.** Nuclear power plants require grid-tied electricity, cooling water and people getting paychecks. Without all these, they melt down, thus immersing all life on earth in ionizing radiation. There's more. Much more. But all the evidence points toward our individual deaths and the extinction of our species in the near future. But most importantly, we get to live now.

#### Climate change outweighs literally any other impact including nuclear war – expert consensus.

Schiller, M.Econ from the London School of Economics, 16 [Ben, 1/19, “Experts Agree: Climate Change Is The Most Serious Of All The Threats Facing The Planet,” Co.Exist, http://www.fastcoexist.com/3055503/experts-agree-climate-change-is-the-most-serious-of-all-the-threats-facing-the-planet , 6/25, AK]

To hear some presidential candidates on the campaign trail, climate change is nothing to worry about—a hoax foisted on the American public as part of some government conspiracy. But that's not how it's seen by **750 experts from business, academia, civil society and the public sector**. Surveyed by the World Economic Forum for its latest Global Risks report, the respondents **rank climate change as the gravest threat facing the planet** over the next decade. In its potential impact**, it's a more serious problem than weapons of mass destruction, cyberwar, terrorism, interstate conflicts, and every other conceivable menace.** One reason climate change figures strongly is that it feeds into other problems. "**Climate change is exacerbating more risks than ever before in terms of water crises, food shortages, constrained economic growth, weaker societal cohesion and increased security risks**," says Cecilia Reyes, chief risk officer at Zurich Insurance, a major reinsurance group. **It's the first time an environmental challenge has topped the list in 11 years the WEF has been publishing its risk analysis.** Weapons of mass destruction was rated the second most impactful problem**, followed by water crises.** The experts also rated risks by their likelihood in the coming year. Large-scale involuntary migration tops the list (one in 122 people worldwide are now displaced), followed by extreme weather events, and, again, climate change (or as the report puts it, the failure to mitigate and adapt to climate change). The report discusses how **rising temperatures and extreme weather events could affect agricultural productivity and disrupt food supply chains.** For example, based on current trends, Sub-Saharan Africa is forecast to see a 40% loss of suitable land to grow maize by 2030, the report says. It calls for more investment in climate-resistant crops (like corn that needs less water to grow) and new types of insurance for farmers so they can invest in agriculture with greater confidence.

## Scenario 1: Ocean Acidification

**Ocean acidification caused by rising CO2 levels causes extinction – immediate action is necessary.**

**Romm 9** (Joe, a Fellow at American Progress and is the editor of Climate Progress, which *New York Times* columnist Tom Friedman called "the indispensable blog" and Time magazine named one of the 25 “Best Blogs of 2010.″ In 2009, *Rolling Stone* put Romm #88 on its list of 100 “people who are reinventing America.” *Time* named him a “Hero of the Environment″ and “The Web’s most influential climate-change blogger.” Romm was acting assistant secretary of energy for energy efficiency and renewable energy in 1997, where he oversaw $1 billion in R&D, demonstration, and deployment of low-carbon technology. He is a Senior Fellow at American Progress and holds a Ph.D. in physics from MIT, “Imagine a World without Fish: Deadly ocean acidification — hard to deny, harder to geo-engineer, but not hard to stop — is subject of documentary ,” http://thinkprogress.org/romm/2009/09/02/204589/a-sea-change-imagine-a-world-without-fish-ocean-acidification-film/, AM)

**Global warming is “capable of wrecking the marine ecosystem and depriving future generations of the harvest of the seas”** (see Ocean dead zones to expand, “remain for thousands of years”). A post on ocean acidification from the new Conservation Law Foundation blog has brought to my attention that the first documentary on the subject, *A Sea Change:* Imagine a World without Fish, is coming out. **Ocean acidification must be a core climate message, since it is hard to deny and impervious to the delusion that geoengineering is the silver bullet**. Indeed, a major 2009 study GRL study, “**Sensitivity of ocean acidification to geoengineered climate stabilization”** (subs. req’d), concluded: The results of this paper support the view that **climate engineering will not resolve the problem of ocean acidification, and that therefore deep and rapid cuts in CO2 emissions are likely to be the most effective strategy to avoid environmental damage from future ocean acidification**. If you want to understand ocean acidification better, see this BBC story, which explains: **Man-made pollution is raising ocean acidity at least 10 times faster than previously thought**, a study says. Or see this *Science* magazine study, “Evidence for Upwelling of Corrosive “Acidified” Water onto the Continental Shelf” (subs. req’), which found Our results show for the first time that **a large section of the North American continental shelf is impacted by ocean acidification**. Other continental shelf regions may also be impacted where anthropogenic CO2-enriched water is being upwelled onto the shelf. Or listen to the Australia’s ARC Centre of Excellence for Coral Reef Studies, which warns: **The world’s oceans are becoming more acid, with potentially devastating consequences for corals and the marine organisms that build reefs and provide much of the Earth’s breathable oxygen. The acidity is caused by the gradual buildup of carbon dioxide (CO2) in the atmosphere, dissolving into the oceans**. Scientists fear it could be lethal for animals with chalky skeletons which make up more than a third of the planet’s marine life”¦. **Corals and plankton with chalky skeletons are at the base of the marine food web. They rely on sea water saturated with calcium carbonate to form their skeletons**. However, **as acidity intensifies, the saturation declines, making it harder for the animals to form their skeletal structures** (calcify). “Analysis of coral cores shows a steady drop in calcification over the last 20 years,” says Professor Ove Hoegh-Guldberg of CoECRS and the University of Queensland. “There’s not much debate about how it happens: put more CO2 into the air above and it dissolves into the oceans. “When CO2 levels in the atmosphere reach about 500 parts per million, you put calcification out of business in the oceans.” (Atmospheric CO2 levels are presently 385 ppm, up from 305 in 1960.) I’d like to see an analysis of what happens when you get to 850 to 1000+ ppm because that is where we’re headed (see U.S. media largely ignores latest warning from climate scientists: “Recent observations confirm “¦ the worst-case IPCC scenario trajectories (or even worse) are being realised” “” 1000 ppm). The CLF post notes: Dr. Jane Lubchenco, Administrator of the National Oceanic and Atmospheric Administration (NOAA) warns that an acidic ocean is the “equally evil twin” of climate change. Scott Doney, a senior scientist at the Woods Hole Oceanographic Institution noted in a public presentation that “New England is the most vulnerable region in the country to ocean acidification.” In June, **dozens of Academies of Science, including ours and China’s, issued a joint statement on ocean acidification**, warned “**Marine food supplies are likely to be reduced with significant implications for food production and security in regions dependent on fish protein, and human health and wellbeing”** and “**Ocean acidification is irreversible on timescales of at least tens of thousands of years.”** They conclude: Ocean acidification is a direct consequence of increasing atmospheric CO2 concentrations. **To avoid substantial damage** to ocean ecosystems, **deep** and rapid **reductions of global CO2** emissions by at least 50% by 2050, and much more thereafter **are needed**. We, the academies of science working through the InterAcademy Panel on International Issues (IAP), call on world leaders to: “¢ **Acknowledge that ocean acidification is a direct and real consequence of increasing atmospheric CO2 concentrations, is already having an effect at current concentrations, and is likely to cause grave harm to important marine ecosystems as CO2 concentrations reach 450 ppm and above;** “¢ Recognise that reducing the build up of CO2 in the atmosphere is the only practicable solution to mitigating ocean acidification; “¢ Within the context of the UNFCCC negotiations in the run up to Copenhagen 2009, recognise the direct threats posed by increasing atmospheric CO2 emissions to the oceans and therefore society, and take action to mitigate this threat; “¢ Implement action to reduce global CO2 emissions by at least 50% of 1990 levels by 2050 and continue to reduce them thereafter. **If we want to save life in the oceans “” and save ourselves, since we depend on that life “” the time to start slashing carbon dioxide emissions is now.**

## Scenario 2: Social Injustice

#### Warming disproportionately harms marginalized communities least responsible for climate change – view warming impacts through an intersectional lens considering race, class, gender, and social status

Rehman 9/14 Rehman, Asad. "Yes, Climate Change Kills More People of Color." *Newsweek*. Newsweek, 14 Sept. 2016. Web. 07 Oct. 2016. international climate campaigner at Friends of the Earth England, Wales and Northern Ireland // VS

Some people really don’t like facts, preferring to be swayed by feeling, hearsay, assumption, and whatever comes along to affirm their own world view. It would be interesting if it didn’t have so much capacity to do damage. Friends of the Earth were called racist and all sorts of things yesterday by the keyboard warrior contingent for supporting the Black Lives Matter protest at City Airport. Facts may not be very good at changing people’s minds but we are not yet so deeply into a post-factual society that we shouldn’t at least consider them. Here’s an honest to God, straight up and down fact: We have just witnessed a record-breaking 14 consecutive months of the hottest global temperatures since records began, with vanishing Arctic sea ice and the bleaching of the Great Barrier Reef just the latest reality we have to face. Scientists say we have to go back 120,000 years before we find hotter temperatures than those currently recorded and are now predicting sea level rises of 10 feet by 2065. Think of some of the largest cities in the world and where they are—Rio, Mumbai, Hong Kong, and Shanghai—to realize what sea level rises will mean. Climate scientists, governments, civil society and anyone else thinking rationally recognize that the impact of our carbon pollution will mean failing agriculture, greater food insecurity, more intense droughts and floods, record-breaking super typhoons and hurricanes, increased water shortages, more extreme weather. These elements lead to the forced displacement of people, and an increase in conflicts, and this is happening now. Typhoon Haiyan, which hit the Philippines in 2013, left 7,000 dead and 2 million homeless. Floods in Pakistan in 2010 affected 20 million people. This year’s heatwave in India and Pakistan hit 51°C, while in the Sahel (the sub-Saharan region of Africa) drought has affected 23 million, and left 3.5 million displaced. Just one tropical storm, Erika, which hit the Caribbean island of Dominica last year, put back development gains by 20 years. And all this is happening at an average temperature of increase of 1°C. It’s hard to put an accurate estimate on how many lives are lost each year to climate change, or how many communities destroyed. Some figures suggest up to700,000 additional deaths per year, although climate change fans every existing inequality in the world. Who are these people who are dying, and who is responsible? It’s the greatest injustice of climate change, that those who are the least responsible for causing the climate crisis, are the first to suffer. **The poor, the marginalized, the indigenous communities are on the frontline—and they are overwhelmingly people of color in developing countries**. And where it is richer, more developed countries dealing with wildfires, such as those in Australia, the U.S. or the floods in Europe, they invariably have more resources to deal with the impact. Here are some more facts—just 10 percent of the world’s population are responsible for 50 percent of emissions, while the poorest 50 percent are responsible for only 10 percent of emissions. No guessing where most of that first 10 percent live. The reality is that rich countries in the West have grown wealthy from burning fossil fuels, and now other countries are using the same dirty development pathway to do the same. An average citizen in the U.S., with just 5 percent of the world's population, still has a per capita income of $41,064 and pollutes 17.3 tonnes of CO 2 . India, with 18 percent of the global population have average of $3,148 per capita income and its citizens are responsible for 1.4 tonnes. The world’s poorest countries—the so-called least developed countries—constitute 11 percent of the global population but have only a per capita income of $1,461, and the average CO 2 output across Africa is 0.9 tonnes. Political decisions are being made for those whose voices are listened to, and it takes protesters such as those in Black Lives Matter to advocate for those whose voices are ignored. The ink on the Paris Agreement isn’t dry, but politicians agreed to keep temperature increases to below the critical 1.5°C guardrail. To prevent a breach of that, we can only pollute at the same rate as we are doing for another six to 10 years. In a fair world, rich countries in the West would have decarbonized decades ago. But the harsh truth is that it’s incompatible with preventing a breach of 1.5°C and even the 2°C guardrail to build new airports, or to progress more dirty energy sources such as fracking. So the Black Lives Matter protestors were absolutely right to say that climate change is killing black people. They are absolutely right to put the spotlight on airport expansion. Globally aviation emissions increased by 71.6 percent between 1990 and 2012, the same volume as the CO 2 emitted by Germany. If aviation was a country, it would be the world’s seventh largest emitter. That’s why the protest happened, and that’s why we need to listen to their message.

## Scenario 3: Loss of Biodiversity

#### Warming exponentially kills biodiversity.

ScienceDaily 13 (Recent and accurate science news, supported by hundreds of organizations; “Climate change will cause widespread global-scale loss of common plants and animals, researchers predict”; May 12, 2013; University of East Anglia; https://www.sciencedaily.com/releases/2013/05/130512140946.htm; DT)

Research published today in the journal Nature Climate Change looked at 50,000 globally widespread and common species and found that more than one half of the plants and one third of the animals will lose more than half of their climatic range by 2080 if nothing is done to reduce the amount of global warming and slow it down. This means that geographic ranges of common plants and animals will shrink globally and biodiversity will decline almost everywhere. Plants, reptiles and particularly amphibians are expected to be at highest risk. Sub-Saharan Africa, Central America, Amazonia and Australia would lose the most species of plants and animals. And a major loss of plant species is projected for North Africa, Central Asia and South-eastern Europe. But acting quickly to mitigate climate change could reduce losses by 60 per cent and buy an additional 40 years for species to adapt. This is because this mitigation would slow and then stop global temperatures from rising by more than two degrees Celsius relative to pre-industrial times (1765). Without this mitigation, global temperatures could rise by 4 degrees Celsius by 2100. The study was led by Dr Rachel Warren from the Tyndall Centre for Climate Change Research at UEA. Collaborators include Dr Jeremy VanDerWal at James Cook University in Australia and Dr Jeff Price, from UEA's school of Environmental Sciences and the Tyndall Centre. The research was funded by the Natural Environment Research Council (NERC). Dr Warren said: "While there has been much research on the effect of climate change on rare and endangered species, little has been known about how an increase in global temperature will affect more common species. "This broader issue of potential range loss in widespread species is a serious concern as even small declines in these species can significantly disrupt ecosystems. "Our research predicts that climate change will greatly reduce the diversity of even very common species found in most parts of the world. This loss of global-scale biodiversity would significantly impoverish the biosphere and the ecosystem services it provides. "We looked at the effect of rising global temperatures, but other symptoms of climate change such as extreme weather events, pests, and diseases mean that our estimates are probably conservative. Animals in particular may decline more as our predictions will be compounded by a loss of food from plants. "There will also be a knock-on effect for humans because these species are important for things like water and air purification, flood control, nutrient cycling, and eco-tourism. "The good news is that our research provides crucial new evidence of how swift action to reduce CO2 and other greenhouse gases can prevent the biodiversity loss by reducing the amount of global warming to 2 degrees Celsius rather than 4 degrees. This would also buy time - up to four decades - for plants and animals to adapt to the remaining 2 degrees of climate change." The research team quantified the benefits of acting now to mitigate climate change and found that up to 60 per cent of the projected climatic range loss for biodiversity can be avoided. Dr Warren said: "Prompt and stringent action to reduce greenhouse gas emissions globally would reduce these biodiversity losses by 60 per cent if global emissions peak in 2016, or by 40 per cent if emissions peak in 2030, showing that early action is very beneficial. This will both reduce the amount of climate change and also slow climate change down, making it easier for species and humans to adapt."

#### Biodiversity loss leads to extinction.

Diner gender paraphrased 94

Military Law Review Winter 1994 143 Mil. L. Rev. 161 LENGTH: 30655 words ARTICLE: THE ARMY AND THE ENDANGERED SPECIES ACT: WHO'S ENDANGERING WHOM? NAME: MAJOR DAVID N. DINER BIO: Judge Advocate General's Corps, United States Army.

Biologically diverse ecosystems are characterized by a large number of specialist species, filling narrow ecological niches. These ecosystems inherently are more stable than less diverse systems. "The more complex the ecosystem, the more successfully it can resist a stress. . . . [l]ike a net, in which each knot is connected to others by several strands, such a fabric can resist collapse better than a simple, unbranched circle of threads -- which if cut anywhere breaks down as a whole." n79 By causing widespread extinctions, humans have artificially simplified many ecosystems. As biologic simplicity increases, so does the risk of ecosystem failure. The spreading Sahara Desert in Africa, and the dustbowl conditions of the 1930s in the United States are relatively mild examples of what might be expected if this trend continues. Theoretically, each new animal or plant extinction, with all its dimly perceived and intertwined affects, could cause total ecosystem collapse and human extinction. Each new extinction increases the risk of disaster. Like a mechanic removing, one by one, the rivets from an aircraft's wings, n80 [hu]mankind may be edging closer to the abyss.

#### Biodiversity loss is a threat multiplier – exacerbates existing crises.

Torres 16 (Phil is a graduate of Cornell University with degrees in Entomology and Biology; "Biodiversity Loss: An Existential Risk Comparable to Climate Change"; 5-20-2016; FLI - Future of Life Institute; http://futureoflife.org/2016/05/20/biodiversity-loss/; DT)

Catastrophic consequences for civilization The consequences of this rapid pruning of the evolutionary tree of life extend beyond the obvious. There could be surprising effects of biodiversity loss that scientists are unable to fully anticipate in advance. For example, prior research has shown that localized ecosystems can undergo abrupt and irreversible shifts when they reach a tipping point. According to a 2012 paper published in Nature, there are reasons for thinking that we may be approaching a tipping point of this sort in the global ecosystem, beyond which the consequences could be catastrophic for civilization. As the authors write, a planetary-scale transition could precipitate “substantial losses of ecosystem services required to sustain the human population.” An ecosystem service is any ecological process that benefits humanity, such as food production and crop pollination. If the global ecosystem were to cross a tipping point and substantial ecosystem services were lost, the results could be “widespread social unrest, economic instability, and loss of human life.” According to Missouri Botanical Garden ecologist Adam Smith, one of the paper’s co-authors, this could occur in a matter of decades—far more quickly than most of the expected consequences of climate change, yet equally destructive. Biodiversity loss is a “threat multiplier” that, by pushing societies to the brink of collapse, will exacerbate existing conflicts and introduce entirely new struggles between state and non-state actors. Indeed, it could even **fuel the rise of terrorism**. (After all, climate change has been linked to the emergence of ISIS in Syria, and multiple high-ranking US officials, such as former US Defense Secretary Chuck Hagel and CIA director John Brennan, have affirmed that climate change and terrorism are connected.) The reality is that we are entering the sixth mass extinction in the 3.8-billion-year history of life on Earth, and the impact of this event could be felt by civilization “in as little as three human lifetimes,” as the aforementioned 2012 Nature paper notes. Furthermore, the widespread decline of biological populations could plausibly initiate a dramatic transformation of the global ecosystem on an even faster timescale: perhaps a single human lifetime. The unavoidable conclusion is that biodiversity loss constitutes an existential threat in its own right. As such, it ought to be considered alongside climate change and nuclear weapons as one of the most significant contemporary risks to human prosperity and survival.

## Scenario 4: Resource Wars

#### **Global warming leads to resource wars.**

Karlin 15 Karlin, Mark. "Global Warming Could Lead to Worldwide Wars." BuzzFlash. BuzzFlash, 16 Sept. 2015. Web. 07 Oct. 2016. Mark Karlin is the editor of BuzzFlash at Truthout. He served as editor and publisher of BuzzFlash for 10 years before joining Truthout in 2010. BuzzFlash has won four Project Censored Awards. Karlin writes a commentary five days a week for BuzzFlash, as well as articles (ranging from the failed "war on drugs" to reviews relating to political art) for Truthout. He also interviews authors and filmmakers whose works are featured in Truthout's Progressive Picks of the Week. Before linking with Truthout, Karlin conducted interviews with cultural figures, political progressives and innovative advocates on a weekly basis for 10 years. He authored many columns about the lies propagated to launch the Iraq War. // VS

It would be a simplification to assert that the mass movement of refugees to Europe is currently primarily caused by global warming. As we've noted previously, wars of empire and economic deprivation have been the leading factors behind the recent surge of people struggling to reach the relative safety and economic stability of European Union nations. However, a September 9 article in the Guardian reports on the warning issued by the former head of Britain's Liberal Democrats, Lord Paddy Ashdown, that "the world will undergo more resource wars and huge movements of desperate people unless it tackles climate change effectively." Ashdown's warning is based on both logical and scientific premises. If global warming damages or destroys the yield of large areas of agricultural production, for example, there will be likely be wars fought over an increasing limited availability of food. In addition, deadly conflicts would also result from a decreasing supply of fresh water. Indeed, the US Defense Department appears to agree with Ashdown, according to a report it issued in 2014, as reported in Responding to Climate Change: US military chiefs have warned climate change is becoming an increasing risk to global security, providing further pause for thought among the Washington political establishment sharply divided on how to tackle global warming. In a report published every four years that outlines future threats to the US military’s interests and potential global flashpoints, the Pentagon said climate change is a "threat multiplier" and would be a major area of future defense strategy. **"The pressures caused by climate change will influence resource** competition while placing additional burdens on economies, societies, and governance institutions around the world," said the report, which was published earlier this week. **Such wars would be over the very basic issue of who shall live and who shall die** - based on who secures access to supplies of food and drinkable water. These conflicts could, in theory, lead to military attacks that are aimed at annihilating whole populations who are competing for the most basic necessities of sustaining life. Lord Ashdown believes that a "vast humanitarian disaster ... will soon unfold," according to the Guardian: "I raised it to make the problem more obvious," [Ashdown explained,] "though I do not know why politicians continue to be so ~~blind~~ [imperceptive] to it." He said evidence of the impacts of climate change was plain to see: "You need only to fly over some of the areas that are being affected – like the Naga Hills on the border of India and Burma, or vast areas of the Ganges delta – to see clearly what’s happening." Tahmima Anam, a Bangladeshi writer and novelist, says that 50,000 people migrate every month to Dhaka, the capital city, because rising sea levels are making their villages uninhabitable and their arable land impossible to cultivate.... Ashdown said: "If governments do not act, then wars over land and resources... will become more common." The impact of global warming on agriculture is already showing, in the forms of prolonged droughts and heat waves, sea level rises that drown cultivatable land, and an increase in destructive weather catastrophes such as hurricanes. Responding to Climate Change also took note of the Pentagon's concern about the increase in wars over potable water: Although the US military didn’t identify specific regions as making water wars more likely, previous studies have identified central and southern Asia could become increasingly unstable because of potential for water shortages in northern India and Pakistan and competition among former Soviet Republics. Even in the US itself, tempers flared last year between states on who should have access to water supplies amid high summer temperatures and a sustained drought, a reminder that even in rich countries access to world’s most basic commodities can become increasingly fraught. The generally hostile European response - with some exceptions, such as Sweden and Germany - to the large number of recent refugees does not bode well, given that the one can foresee in the coming decades wars over food and water. In the US, the defamatory scapegoating of Mexicans for many of the nation's current problems is also an ominous sign. In the future, it is likely that food and water will become "national security" issues - and that "others" who seek refuge in the US in order to stay alive will be considered "competitors" for survival, and therefore disposable. Europe, it appears, would be likely to adopt the same destructive policies.

# Contention 3: Solvency

**US/China Cooperation only way to solve climate change- they are the two biggest emitters**

**Makinen, Reporter in the Los Angeles Times’ Beijing bureau, Megerian, Reporter for the Los Angeles Times’, 2015**

[Julie, Chris, 12-13-15, Los Angeles Times, “China, U.S. Relationship Key in Climate Agreement”, http://www.latimes.com/world/asia/la-fg-china-u-s-climate-20151213-story.html, accessed 6-23-16, KDC]

Even as smog levels in Beijing often turn the sky a smoky gray, one thing was clear at the global climate change talks in Paris: China, once a laggard, emerged as a key player in the battle to help avert the worst effects of global warming. The shift, by the world’s largest emitter of greenhouse gases, helped pave the way for the commitment by nearly 200 nations to reduce emissions. “You had a developing country and somebody who had been leading the efforts against us,” said Secretary of State John F. Kerry, “that opened the door.” After the December 2009 Copenhagen climate talks descended into chaos, some of the sharpest finger-pointing had been directed at China. Beijing didn’t send Premier Wen Jiabao to the final discussions that time, leaving leaders including President Obama and German Chancellor Angela Merkel to negotiate with an official who frequently left the room to phone his superiors. The Chinese pushed to remove specific targets on emissions cuts — even those that would apply only to advanced industrialized countries and not itself. “China wrecked the talks … and insisted on an awful ‘deal’ so Western leaders would walk away carrying the blame,” British environmental author Mark Lynas, who was with one of the national delegations, wrote in a fly-on-the-wall account. What a difference six years makes: Obama and Chinese President Xi Jinping appeared side by side at the start of this year’s Paris climate change talks. And on Saturday, as global leaders congratulated themselves on reaching an agreement, the U.S. was singling out China for praise for its constructive engagement. Asked after the vote to cite the most important steps along the way that enabled the deal, Kerry immediately pointed to China’s willingness to “build a working partnership” with Washington and jointly announce national emissions-reduction targets in advance. What explains China’s shift? It’s not necessarily pangs of guilt nor a newfound sense of global munificence. Instead, after years of downplaying its environmental crisis, Chinese leaders appear to have recognized that cleaning up China’s toxic skies and pushing the country toward renewable energy are crucial to maintaining the Communist Party’s grip on power amid rising public discontent. Now, instead of regarding any multilateral environmental pact as a hindrance to unbridled economic growth, China sees an opportunity to seize agreements such as the Paris deal to showcase itself as a progressive superpower and responsible international stakeholder — while doing things it needs to do at home anyway. The Obama administration, said Kerry, recognized this coming convergence in 2013 and sought to capitalize on it “to change the paradigm of what happened in Copenhagen.” “We saw they had environmental challenges in China and had [a self-] interest, therefore, and we tried to tap into that.” The alignment between China’s domestic agenda and its willingness to step up in Paris was brought into sharp relief last week as air pollution levels skyrocketed in Beijing. For the first time, city officials issued a “red alert,” closing schools, shutting down work at construction sites and ordering millions of cars off the capital’s roads. Since Xi came to power about three years ago, Chinese leaders have shown increasing political will to impose extraordinary measures to clean the skies, even if it means curtailing economic activity. To be sure, the steps have been uneven and at times downright vain — China has been most willing to shutter factories and curb coal burning when it’s hosting high-profile international gatherings in Beijing such as the 2014 Asia-Pacific Economic Cooperation summit, September’s military parade, and international sporting events. Although the immediate goal is to protect public health, not halt global warming, the strictures generally target the same carbon-generators that cause global warming. At the same time, Chinese authorities are pushing the development of solar, wind, hydropower and nuclear power — and to make China’s alternative energy sector a global economic force. China has become the world’s biggest investor in renewable energy and plans to launch a nationwide carbon emissions trading market in 2017. These changes come as China increasingly acknowledges the human and financial toll of pollution. A 2014 joint study by the World Bank and China’s government estimated that air pollution alone may cost the nation up to $300 billion a year. Another report led by economists and former foreign heads of state noted that smog is blamed for more than a million premature deaths annually in China, and said those deaths may cost the nation up to 13% of its GDP. Sam Geall, a University of Sussex research fellow, said in a recent report that diplomacy certainly has helped push China along. “But far more important is the growing awareness that climate impacts and air pollution pose major threats to [China’s] development,” he said. “In short, China’s new approach rests on the fact that its leaders see combating climate change as being in the national interest,” he added. “And underpinning that perception is not only a vision of how China might position itself in [the] future, but also a real transformation already underway in China’s economy.” On the U.S. side, Obama has also become progressively bold, even as Congress shows resistance, said Eric Pooley, senior vice president for strategy and communications at the Environmental Defense Fund. With executive branch initiatives such as the EPA’s Clean Power Plan — which takes effect this month and is designed to cut carbon emissions from power plants — Obama has been looking to make his environmental policies a centerpiece of his legacy. That momentum is a contrast from 2009, when the president’s eco-agenda had just suffered a defeat as the Waxman-Markey cap-and-trade bill failed in Congress, weakening his hand on the world stage. Six years ago, “both of the biggest nations in the world were not ready to deal,” Pooley said. Now, “the dynamic between the U.S. and China has totally changed.... They used to blame each other for inaction. Now they’re encouraging each other toward more ambitious action.” In some ways, Washington and Beijing have been driven to find common ground on global warming because they have failed to see eye to eye on so many other issues, including trade and cyberattacks, as well as human rights and the South China Sea. “China and the United States need an area where they can cooperate,” said Nathaniel Keohane, a former Obama White House staffer and now vice president for global climate at the Environmental Defense Fund. “Climate change is becoming that area.” Momentum soared in November 2014 when Obama attended the APEC summit in Beijing and announced with Xi that the countries would both pursue policies to cut carbon emissions. Obama pledged the U.S. would emit at least 26% less carbon in 2025 than it did in 2005. Xi vowed his country would “peak” its carbon emissions by 2030, if not sooner, and said solar, wind and other clean energy technology would account for 20% of China’s total power production by that year. Their bilateral agreement “sent a powerful signal to the rest of the world,” said Alden Meyer of the Union of Concerned Scientists, a veteran of climate negotiations. “If the world's two biggest emitters aren't serious about dealing with the problem, you can't deal with the problem.” Seeing them work together, he added, “gave people a sense of hope.”

**Past Sino-US cooperation on environmental issues has been effective, but an increase is necessary to combat climate change -- sets an example for the rest of the world – LP amina proves**

**Forbes, senior associate at WRI and** Sarah, and Jonathan **Moch**. "How U.S.-China Cooperation Can Expand Clean Energy Development." World Resources Institute. World Resources Institute, 25 Apr. **2014.** Web. 22 June 2016. <http://www.wri.org/blog/2014/04/ how-us-china-cooperation-can-expand-clean-energy-development>. (Sarah Forbes testified before the U.S.-China Economic and Security Review Commission, discussing U.S.-China cooperation on clean energy and its global impact on climate change.)

One year ago, the United States and China declared in their Joint Statement on Climate Change that “**forceful, nationally appropriate action by the United States and China—including large-scale cooperative action—is more critical than ever. Such action is crucial both to contain climate change and to set the kind of powerful example that can inspire the world.”** Indeed, **China and the United States hold the two biggest environmental footprints, together responsible for more than 40 percent of global greenhouse gas emissions.** And **both countries currently rely heavily on fossil fuels to power their economies,** primarily drawing on coal, natural gas, and oil. Today, I testified before the U.S.-China Economic and Security Review Commission, discussing U.S.-China cooperation on clean energy. It’s clear that **while the two countries are beginning to collaborate on low-carbon initiatives, significantly reducing emissions requires a much more significant, sustained effort.** **Cooperation on clean energy can yield benefits in both countries—for their economies, energy security, and for alleviating climate change.** **The United States and China are beginning to collaborate on some clean energy initiatives—and some projects are already producing benefits for both countries.** The case of **LP Amina and other examples illustrate the virtues of collaboration between the two countries.** Based in North Carolina, LP Amina developed and patented a new coal classifier to sort pulverized coal. The classifier prevents larger coal particles from entering a coal boiler, reducing nitrogen oxide emissions by up to 15 percent and slightly improving energy efficiency. Yet despite these benefits, customers in the United States would not buy the new classifier because it had not yet been demonstrated. **After engagement in joint research** and development **and workshops convened by the US-China Clean Energy Research Center** (CERC), LP Amina installed one of its new classifiers at the Fengtai Power Station in the Anhui Province in eastern China. This successful demonstration in China gave LP Amina the credibility it needed to market the classifier to plants in the United States, and **the technology is now being deployed globally. The technology helps reduce coal plant pollution while also creating American** manufacturing **jobs**. Each classifier keeps 10-20 manufacturing workers busy for a month, and manufacturers in Michigan, Ohio, and West Virginia are already building them. **The LP Amina is just one example of how collaboration can help advance low-carbon initiatives in China, the United States, and globally.** We’re also seeing some positive U.S.-China collaboration on clean energy at the research, business, and government levels: At the researcher level, **collaboration between Chinese and U.S. scientists and engineers is especially useful, because it allows for data and ideas to be shared across groups of individuals with different areas of expertise, and can lead to new discoveries**. As an example, researchers at Huaneng Energy, Lawrence Livermore National Laboratory, and Duke Energy have conducted carbon capture and storage (CCS) cost modeling on Duke’s Gibson Power Plant and Huaneng’s Shidonku plant. This **collaboration among researchers** has made it much easier to model the comparative advantages of CCS on the two power plants. For U.S. and Chinese businesses, collaboration allows the spreading of risk. It **can help move technologies forward by vastly expanding market opportunities and helping a technology move down the development chain in a much more efficient manner.** **The LP Amina example shows how a potentially beneficial technology can get stuck in the development process due to lack of opportunities in a particular country. Cooperation, however, allows these types of obstacles**—such as lack of opportunities for demonstrations—**to be overcome.** As another example of business collaboration, U.S. and Chinese companies like Boeing, Honeywell, PetroChina, and Air China have been collaborating to develop biofuels for passenger jets. In 2011, this effort led to a successful Chinese test flight of a Boeing 747 using a 50 percent blend of traditional jet fuel and the new biofuel. Finally, **cooperation also occurs at the level of the U.S. and Chinese governments. This level of coordination is essential to large-scale deployment of clean energy technologies and in helping companies and researchers navigate the energy landscape. Along with the previously mentioned CERC, an example of government collaboration includes the U.S.-China Renewable Energy Partnership. This initiative helps map renewable energy deployments in each country, conducts an annual U.S.-China renewable energy forum, and fosters the sharing of best practices.** 3 Ways to Bolster U.S.-China Collaboration on Clean Energy **These early initiatives are promising, and they already starting to yield some progress. But truly scaling up clean energy in both nations at the level necessary to significantly reduce emissions requires a greater, more sustained effort. For one**, researchers, businesses, and **governments should collaborate rather than operate in their own, silo-ed initiatives. The U.S. and China have had some success in encouraging multi-level cooperation—such as through the CERC and the U.S.-China Renewable Energy Partnership—but more needs to be done. Secondly, an important area of expansion is into the realm of environmental policy. Historically, U.S.-China collaboration has focused only on technology and not on the important interaction between technology and policy. This approach fails to address the environmental impacts of technology deployment—an important process when mapping out a sustainable energy future. Future collaborative efforts should involve both technical and policy aspects of clean energy deployment. One way to accomplish this would be for the United States and China to initiate a platform for multi-agency/ministry dialogue that is focused specifically on environmental policies needed for clean energy deployment, such as national renewable energy plans. Finally, U.S.-China clean energy collaboration needs to be more sustained and coordinated. The Climate Change Working Group (CCWG)—established by the United States and China in July of 2013 to—is designed explicitly to bring the relevant agencies and ministries together to pursue low-carbon development. However, its scope is currently limited to collaboration on just five issue areas. The CCWG, or some yet-to-be-established entity, needs the power to coordinate sustained, long-term clean energy cooperation between the two countries. In a world where companies and products are globally integrated, the benefits of U.S.-China cooperation on clean energy innovation extends beyond either country. By leveraging and combining the collective ingenuity of engineers and scientists, businesses, and governments in both the United States and China, we can help unlock a clean energy revolution.**

**The plan ensures success of Clean Energy Research Collaboration – it increases coordination, brings in the private sector, and focuses on the most effective renewables – crucial to effective coop**

**Yang 16**, (CCS Team Lead in WRI’s Climate Program. WRI’s CCS team provides strategic advice on the development of best practices, regulations, and standards for CCS and participates in the development of national and international strategies for CCS deployment, consistent with environmental and social integrity. WRI also plays a leading role in communication and integration of the U.S.-China Clean Energy Research Center Advanced Coal Technology Consortium, U.S.-CHINA CLEAN ENERGY COLLABORATION: LESSONS FROM THE ADVANCED COAL TECHNOLOGY CONSORTIUM, www.wri.org/sites/default/files/US\_China\_Clean\_Energy\_Collaboration\_lessons\_from\_the\_Advanced\_Coal\_Technology\_Consortium\_1.pdf)

6.1 Strengthen Communication at Several Levels ▪ At the consortium level, enhance communication between directors and coordinate on project planning, funding allocation, membership recruitment, and research progress through a **stable communication channel** and **regular two-way personal visits**; allow flexibility in resource allocation among tasks; assign a point of contact at the consortium level on both sides and hold regular check-in meetings. ▪ At the project level, increase the **frequency of communication** (e.g. once every two weeks); increase **personal exchanges** and work together in real time (inperson workshop once a year in addition to the annual meeting); assign a point of contact at the project level. 6.2 Strengthen Private-Sector Participation ▪ Involve private-sector partners in the **initial discussions to set up the research agenda**; understand the needs of the private sector and present what the consortium can offer to help meet those needs; involve private sector partners in establishing an IP framework that satisfies stakeholders, based on the national law on IP issues; involve private-sector participants in evaluating research performance. ▪ It may be useful to implement two or three **outreach events** in Washington, DC and Beijing during the spring of 2016, in order to present ACTC information to relevant companies, research institutions, and provincial government officials. This type of roadshow could provide an opportunity for consortium and research leaders to present Phase I achievements and **spur interest in research** topics for Phase II. 6.3 **Strengthen Joint RD&D** ▪ Research should be centered on industrial-scale demonstration projects; therefore, research resources need to be consolidated (there are currently too many research projects and individual projects **receive inadequate resources**). ▪ Resources should be **prioritized** toward projects that are of interest to researchers in both countries and are **truly collaborative**. As our results show, not all research tasks attract equal levels of interest from both sides. 6.4 Create Flexibility in Changing Research Direction and Membership ▪ Identification of appropriate partners at all stages should be a priority, and a mechanism for quick acceptance or withdrawal of membership should be considered; establish a mechanism that allows new members to **quickly join** the **collaborative activities**.6 ▪ CERC–ACTC can also serve as a platform to facilitate technology advancement in clean coal, and could regularly hold workshops for public outreach to attract new resources and members. 6.5 Barriers to Implementing the Recommendations The CERC–ACTC has fundamental value in two areas: international politics and science and **tech**nology **development**. CERC has **clearly demonstrated its political value** through its role in bringing the **U**nited **S**tates and China together to mitigate climate change. As Minister Wan Gang of MOST indicated in the 2015 CERC Steering Committee meeting, CERC has **greatly enriched** the development of the **new type of Great Power relationship** between the **U**nited **S**tates and China. Furthermore, both the 2014 and 2015 U.S.-China Presidential Joint Announcements included CERC, and stated that the two countries will continue to support and expand this collaborative technology platform. Providing strong support to technology development through CERC– ACTC now will drive CCS technology learning to achieve commercialization, ideally by 2030. In order to implement the recommendations above, it will be key to **convert CERC’s political value to its technology motivation**: a collaborative platform, with **high-level support** and hundreds of leading scientists and engineers in the **U**nited **S**tates and **China**, which can **speed up the tech**nology **learning process**. One primary barrier to faster learning is **lack of clarity about each institution’s role**, including public research institutes and private players, in terms of who leads demonstration and who supports research. The ideal situation for the CERC–ACTC type of bilateral research platform may be that governments provide funding, private companies lead demonstration projects, and public research institutes tackle the scientific and engineering problems around the demonstration projects. **Only with mutually agreed-upon roles will this learning system create a united vision and suitable plans to achieve it**. A second barrier is lack of integration of commercial and research interests, which was not achieved in the first phase of collaboration. With a view to better integration, the U.S.-side ACTC plans to establish a council composed of private companies that will provide strategic research guidance and evaluate the RD&D activities from the market perspective in 2016. Overall, market-oriented climate mitigation is the **only way forward for CCS technology**.

**Plan drives down cost of renewables globally – key to solve**

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[“China-US Cooperation: Key to the Global Future”, CIIS, Jan 13, 2014, http://www.ciis.org.cn/english/2014-01/13/content\_6606656.htm, 6-26-16. I.B.]

Cooperation on climate change mitigation, adaptation, and consequence management. China-US cooperation will be increasingly critical to the global response to climate change. New scientific studies warn that the worst-case scenarios for climate change impacts are the most likely outcomes. Scientific assessments also maintain that anthropomorphic climate change is partly responsible for extreme weather events that the world is already experiencing at an increasing rate, from the floods in Pakistan and the heat wave in Russia to the melting glaciers and ice sheets and the “superstorm” Sandy that inflicted unprecedented destruction on New York and New Jersey. It is highly likely that global climate change will be a key issue in the coming two decades as the world faces increasing climate-induced humanitarian disasters and infrastructure destruction requiring immediate and expensive relief as well as costly, long-term adaptation. Climate change likely will increase social and political instability in many areas of the world, including emerging economies and developed countries. It also will likely renew political pressure for emissions reductions, especially by China and the United States, the world’s two biggest emitters. China-US cooperation in all these areas will be critical to whether the world cooperates and how effective any cooperation is in responding to the potentially existential threat posed by global climate change. The two countries also can build on decades of bilateral cooperation on energy and environment to seize opportunities for lucrative joint energy technology development that would substantially benefit Chinese and US businesses as well as lower costs and widely disseminate clean energy technologies.

#### Co-development of technology allows easier innovation and commercialization of new tech – complementary strengths and ability to meet concerns solve

Lieberthal, prof of political science and special assistant to the president, and Sandalow, Assistant secretary for State of Oceans/envriontment/science, 09 (Kenneth Lieberthal is Professor of Political Science and Professor of Business Administration at the University of Michigan. Dr. Lieberthal served as Special Assistant to the President for National Security Affairs and Senior Director for Asia on the National Security Council from August 1998 to October 2000. Dr. Lieberthal has a B.A. from Dartmouth College, and two M.A.’s and a Ph.D. in Political Science from Columbia University. David Sandalow is Energy & Environment Scholar and a senior fellow at the Brookings Institution. Mr. Sandalow has served as Assistant Secretary of State for Oceans, Environment & Science; Senior Director for Environmental Affairs, National Security Council; Associate Director for the Global Environment, White House Council on Environmental Quality. He is a graduate of the University of Michigan Law School (JD) and Yale College (BA Philosophy). January 2009"Overcoming Obstacles to U.S.-China Cooperation on Climate Change," Brookings Institution, http://www.brookings.edu/research/reports/2009/01/climate-change-lieberthal-sandalow)

The United States and China have complementary strengths with regards to technology development. The U.S. has a relative lead in terms of human capital, basic science research, and the ability to move breakthroughs from research to commercialization. China has a keener grasp of what will work in developing countries, has its own substantial technical capabilities, and can provide good conditions for test beds and scaling up. It is also often able to manufacture products more rapidly and cheaply than the United States. Technology cooperation between the two countries has tremendous potential to help advance clean energy and fight global warming. Technologies are typically developed to optimize outcomes under particular circumstances. Co-development linking U.S. and Chinese efforts would be a powerful approach to reducing emissions of greenhouse gases in each country. Many joint technology projects will primarily entail the private sector and private research labs, think tanks and universities. The two governments can, nevertheless, take measures to encourage and enable the link-ups that will produce results. First, the two governments should find methods to build bridges between pertinent people and projects on both sides. This might entail funding databases and research, promoting public-private partnerships, and encouraging specific exchanges. **All of this will work better if the two governments explicitly agree to make co-development of emissions reduction technologies a major sphere of joint initiative**. Both sides can contribute funds to these efforts, and it should be possible, with government assistance, to mobilize international financial support at some level. The nature and scale of technology cooperation will depend on the ability of each side to meet the concerns of the other. 51 U.S. partners will ask questions about the ability of Chinese partners to protect intellectual property and enforce contracts setting forth rules with respect to the use of technology. Chinese partners will ask questions about concessional financing. There is ample room for the United States and China to work together to answer these questions and address concerns. If the senior leaders of the United States and China agree on this approach, they should seek to announce a few major joint projects that would highlight the commitment to the new effort and capture the public’s imagination. Possibilities include pilot projects to capture and store carbon dioxide emissions from coal plants and joint efforts to develop and promote electric vehicles. 47 Under the UN Framework Convention on Climate Change, the United States and other industrialized countries assumed specific responsibilities with respect to technology transfer to developing countries. These responsibilities were re-affirmed under the recent Bali accord. One challenge in meeting these obligations is that, in the United States, much of the potentially relevant technology belongs to private sector companies. Projects of the kind described above can help fulfill obligations under the Framework Convention while reducing emissions and spurring economic growth.

#### The state is inevitable – policymaking is the only way to create change, all other narratives get co-opted.

Coverstone 5 Alan Coverstone (masters in communication from Wake Forest, longtime debate coach) “Acting on Activism: Realizing the Vision of Debate with Pro-social Impact” Paper presented at the National Communication Association Annual Conference November 17th 2005 JW 11/18/15

An important concern emerges when Mitchell describes reflexive fiat as a contest strategy capable of “eschewing the power to directly control external actors” (1998b, p. 20). Describing debates about what our government should do as attempts to control outside actors is debilitating and disempowering. Control of the US government is exactly what an active, participatory citizenry is supposed to be all about. After all, if democracy means anything, it means that citizens not only have the right, they also bear the obligation to discuss and debate what the government should be doing. Absent that discussion and debate, much of the motivation for personal political activism is also lost. Those who have co-opted Mitchell’s argument for individual advocacy often quickly respond that nothing we do in a debate round can actually change government policy, and unfortunately, an entire generation of debaters has now swallowed this assertion as an article of faith. The best most will muster is, “Of course not, but you don’t either!” The assertion that nothing we do in debate has any impact on government policy is one that carries the potential to undermine Mitchell’s entire project. If there is nothing we can do in a debate round to change government policy, then we are left with precious little in the way of pro-social options for addressing problems we face. At best, we can pursue some Pilot-like hand washing that can purify us as individuals through quixotic activism but offer little to society as a whole. It is very important to note that Mitchell (1998b) tries carefully to limit and bound his notion of reflexive fiat by maintaining that because it “views fiat as a concrete course of action, it is bounded by the limits of pragmatism” (p. 20). Pursued properly, the debates that Mitchell would like to see are those in which the relative efficacy of concrete political strategies for pro-social change is debated. In a few noteworthy examples, this approach has been employed successfully, and I must say that I have thoroughly enjoyed judging and coaching those debates. The students in my program have learned to stretch their understanding of their role in the political process because of the experience. Therefore, those who say I am opposed to Mitchell’s goals here should take care at such a blanket assertion. However, contest debate teaches students to combine personal experience with the language of political power. Powerful personal narratives unconnected to political power are regularly co-opted by those who do learn the language of power. One need look no further than the annual state of the Union Address where personal story after personal story is used to support the political agenda of those in power. The so-called role-playing that public policy contest debates encourage promotes active learning of the vocabulary and levers of power in America. Imagining the ability to use our own arguments to influence government action is one of the great virtues of academic debate. Gerald Graff (2003) analyzed the decline of argumentation in academic discourse and found a source of student antipathy to public argument in an interesting place. I’m up against…their aversion to the role of public spokesperson that formal writing presupposes. It’s as if such students can’t imagine any rewards for being a public actor or even imagining themselves in such a role. This lack of interest in the public sphere may in turn reflect a loss of confidence in the possibility that the arguments we make in public will have an effect on the world. Today’s students’ lack of faith in the power of persuasion reflects the waning of the ideal of civic participation that led educators for centuries to place rhetorical and argumentative training at the center of the school and college curriculum. (Graff, 2003, p. 57) The power to imagine public advocacy that actually makes a difference is one of the great virtues of the traditional notion of fiat that critics deride as mere simulation. Simulation of success in the public realm is far more empowering to students than completely abandoning all notions of personal power in the face of governmental hegemony by teaching students that “nothing they can do in a contest debate can ever make any difference in public policy.” Contest debating is well suited to rewarding public activism if it stops accepting as an article of faith that personal agency is somehow undermined by the so-called role playing in debate. Debate is role-playing whether we imagine government action or imagine individual action. Imagining myself starting a socialist revolution in America is no less of a fantasy than imagining myself making a difference on Capitol Hill. Furthermore, both fantasies influenced my personal and political development virtually ensuring a life of active, pro-social, political participation. Neither fantasy reduced the likelihood that I would spend my life trying to make the difference I imagined. One fantasy actually does make a greater difference: the one that speaks the language of political power. The other fantasy disables [prevents] action by making one a laughingstock to those who wield the language of power. Fantasy motivates and role-playing trains through visualization. Until we can imagine it, we cannot really do it. Role-playing without question teaches students to be comfortable with the language of power, and that language paves the way for genuine and effective political activism. Debates over the relative efficacy of political strategies for pro-social change must confront governmental power at some point. There is a fallacy in arguing that movements represent a better political strategy than voting and person-to-person advocacy. Sure, a full-scale movement would be better than the limited voice I have as a participating citizen going from door to door in a campaign, but so would full-scale government action. Unfortunately, the gap between my individual decision to pursue movement politics and the emergence of a full-scale movement is at least as great as the gap between my vote and democratic change. They both represent utopian fiat. Invocation of Mitchell to support utopian movement fiat is simply not supported by his work, and too often, such invocation discourages the concrete actions he argues for in favor of the personal rejectionism that under girds the political cynicism that is a fundamental cause of voter and participatory abstention in America today.

#### The timeframe of runaway warming means pragmatic solutions are key – all K’s either preclude the plan and cause extinction or allow the plan and are non-competitive.

Parenti 13 – PhD in Sociology

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Several strands of green thinking maintain that capitalism is incapable of a sustainable relationship with non-human nature because, as an economic system, capitalism has a growth imperative while the earth is finite. One finds versions of this argument in the literature of eco-socialism, deep ecology, eco-anarchism, and even among many mainstream greens who, though typically declining to actually name the economic system, are fixated on the dangers of “growth.”¶ All this may be true. Capitalism, a system in which privately owned firms must continuously out-produce and out-sell their competitors, may be incapable of accommodating itself to the limits of the natural world. However, that is not the same question as whether capitalism can solve the more immediate climate crisis.¶ Because of its magnitude, the climate crisis can appear as the sum total of all environmental problems—deforestation, over-fishing, freshwater depletion, soil erosion, loss of biodiversity, chemical contamination. But halting greenhouse gas emissions is a much more specific problem, the most pressing subset of the larger apocalyptic panorama.¶ And the very bad news is, time has run out. As I write this, news arrives of an ice-free arctic summer by 2050. Scientists once assumed that would not happen for hundreds of years.¶ Dealing with climate change by first achieving radical social transformation—be it a socialist or anarchist or deep-ecological/neo-primitive revolution, or a nostalgia-based localista conversion back to a mythical small-town capitalism—would be a very long and drawn-out, maybe even multigenerational, struggle. It would be marked by years of mass education and organizing of a scale and intensity not seen in most core capitalist states since the 1960s or even the 1930s.¶ Nor is there any guarantee that the new system would not also degrade the soil, lay waste to the forests, despoil bodies of water, and find itself still addicted to coal and oil. Look at the history of “actually existing socialism” before its collapse in 1991. To put it mildly, the economy was not at peace with nature. Or consider the vexing complexities facing the left social democracies of Latin America. Bolivia, and Ecuador, states run by socialists who are beholden to very powerful, autonomous grassroots movements, are still very dependent on petroleum revenue.¶ A more radical approach to the crisis of climate change begins not with a long-term vision of an alternate society but with an honest engagement with the very compressed timeframe that current climate science implies. In the age of climate change, these are the real parameters of politics.¶ Hard Facts¶ The scientific consensus, expressed in peer-reviewed and professionally vetted and published scientific literature, runs as follows: For the last 650,000 years atmospheric levels of CO2—the primary heat-trapping gas—have hovered at around 280 parts per million (ppm). At no point in the preindustrial era did CO2 concentrations go above 300 ppm. By 1959, they had reached 316 ppm and are now over 400 ppm. And the rate of emissions is accelerating. Since 2000, the world has pumped almost 100 billion tons of carbon into the atmosphere—about a quarter of all CO2 emissions since 1750. At current rates, CO2 levels will double by mid-century.¶ Climate scientists believe that any increase in average global temperatures beyond 2 degrees Celsius above preindustrial levels will lead to dangerous climate change, causing large-scale desertification, crop failure, inundation of coastal cities, mass migration to higher and cooler ground, widespread extinctions of flora and fauna, proliferating disease, and possible social collapse. Furthermore, scientists now understand that the earth’s climate system has not evolved in a smooth linear fashion. Paleoclimatology has uncovered evidence of sudden shifts in the earth’s climate regimes. Ice ages have stopped and started not in a matter of centuries, but decades. Sea levels (which are actually uneven across the globe) have risen and fallen more rapidly than was once believed.¶ Throughout the climate system, there exist dangerous positive-feedback loops and tipping points. A positive-feedback loop is a dynamic in which effects compound, accelerate, or amplify the original cause. Tipping points in the climate system reflect the fact that causes can build up while effects lag. Then, when the effects kick in, they do so all at once, causing the relatively sudden shift from one climate regime to another.¶ Thus, the UN’s Intergovernmental Panel on Climate Change says rich countries like the United States must cut emissions 25 percent to 40 percent below 1990 levels by 2020—only seven years away—and thereafter make precipitous cuts to 90 percent below 1990 levels by 2050. This would require global targets of 10 percent reductions in emissions per annum, starting now. Those sorts of emissions reductions have only occurred during economic depressions. Russia’s near total economic collapse in the early 1990s saw a 37 percent decrease in CO2 emissions from 1990 to 1995, under conditions that nobody wants to experience. ¶ The political implications of all this are mind-bending. As daunting as it may sound, it means that it is this society and these institutions that must cut emissions. That means, in the short-term, realistic climate politics are reformist politics, even if they are conceived of as part of a longer-term anti-capitalist project of totally economic re-organization.¶ Dreaming the Rational¶ Of course, successful reformism often involves radical means and revolutionary demands. What other sort of political pressure would force the transnational ruling classes to see the scientific truth of the situation? But let us assume for a second that political elites faced enough pressure to force them to act. What would be the rational first steps to stave off climate chaos?¶ The watchwords of the climate discussion are mitigation and adaptation—that is, we must mitigate the causes of climate change while adapting to its effects. Mitigation means drastically cutting our production of CO2 and other greenhouse gases, such as methane and chlorofluorocarbons, that prevent the sun’s heat from radiating back out to space.¶ Mitigation means moving toward clean energy sources, such as wind, solar, geothermal, and tidal kinetic power. It means closing coal-fired power plants, weaning our economy off fossil fuels, building a smart electrical grid, and making massive investments in carbon-capture and -sequestration technologies. (That last bit of techno-intervention would have to be used not as a justification to keep burning coal, as is its current function, but to strip out atmospheric CO2 rapidly and get back to 350 ppm and away from the dangerous tipping points.)¶ Adaptation, on the other hand, means preparing to live with the effects of climatic changes, some of which are already underway and some of which are inevitable. Adaptation is both a technical and a political challenge.¶ Technical adaptation means transforming our relationship to non-human nature as nature transforms. Examples include building seawalls around vulnerable coastal cities, giving land back to mangroves and everglades so they can act to break tidal surges during giant storms, opening wildlife migration corridors so species can move away from the equator as the climate warms, and developing sustainable forms of agriculture that can function on an industrial scale even as weather patterns gyrate wildly.¶ Political adaptation, on the other hand, means transforming social relations: devising new ways to contain, avoid, and deescalate the violence that climate change is fueling and will continue to fuel. That will require progressive economic redistribution and more sustainable forms of development. It will also require a new diplomacy of peace building.¶ Unfortunately, another type of political adaptation is already under way—that of the armed lifeboat. This adaptation responds to climate change by arming, excluding, forgetting, repressing, policing, and killing. The question then becomes how to conceive of adaptation and mitigation as a project of radical reform—reforms that achieve qualitative change in the balance of power between the classes.¶ The core problem in the international effort to cut emissions is fundamentally the intransigence of the United States: it failed to ratify the Kyoto Protocol and has played an obstructionist role at subsequent negotiations. Domestically, progress has been just as frustratingly slow. We have no carbon tax, nor any program of robust investment in clean technology. Even the minimal production tax credit for clean energy generated by solar, wind, and hydro power has not been locked in as a long-term commitment. This creates uncertainty about prices, and, as a result, private investment in clean tech is stalling.¶ China, on the other hand, though now the world’s second-largest economy and largest greenhouse gas polluter, is moving ahead with a fast-growing clean-tech industry—that is to say, with mitigation. The Chinese wind sector has grown steadily since 2001. “According to new statistics from the China Electricity Council,” reported American Progress senior fellow Joseph Romm, “China’s wind power production actually increased more than coal power production for the first time ever in 2012.” This growth is the result, in part, of robust government support: China has invested $200.8 billion in stimulus funding for clean tech. Estimates of U.S. stimulus funding for clean technology range from $50 to $80 billion.¶ The European Union is also moving forward to create a €1 trillion regional supergrid. Germany and Portugal in particular are moving aggressively to expand their already quite large clean-tech sectors. Action in the core industrial economies is essential because only they have the infrastructure that can propel the clean-tech revolution and transform the world economy.¶ A De Facto Carbon Tax¶ Environmental economists tend to agree that the single most important thing the United States could do to accelerate the shift to clean energy would be to impose a carbon tax. Despite our political sclerosis and fossil fuel fundamentalism, the means to do that already exist.¶ First and foremost, there is the Environmental Protection Agency, which could achieve significant and immediate emissions reductions using nothing more than existing laws and current technologies. According to Kassie Siegel at the Center for Biological Diversity, “The Clean Air Act can achieve everything we need: a 40 percent reduction of greenhouse gas emissions over 1990 levels by 2020.”¶ Rather boring in tone and dense with legalistic detail, the ongoing fight over EPA¶ rulemaking is probably the most important environmental battle in a generation. Since 2007, thanks to the pressure and lawsuits of green activists, the EPA has had enormous—but under-utilized—power. That was the year when the Supreme Court ruled, in Massachusetts v. Environmental Protection Agency, that the agency should determine whether greenhouse gases threaten human health. In December 2010, the EPA published a science-based “endangerment finding,” which found that CO2 and five other greenhouse gases are, in fact, dangerous to human life because they cause global warming.¶ Once the EPA issues an endangerment finding, it is legally bound to promulgate regulations to address the problem. The first of these post–Massachusetts v. EPA “tailoring rules” were for “mobile sources.” Between 2011 and 2012, regulations for cars and for trucks went into effect. Then the EPA set strict limits for new power plants in 2012. But other major sources of greenhouse gas pollution—like existing electric power plants (which pump out roughly 40 percent of the nation’s total GHG emissions), oil refineries, cement plants, steel mills, and shipping—have yet to be properly regulated pursuant to Massachusetts v. EPA.¶ If the EPA were to use the Clean Air Act—and do so “with extreme prejudice”—it could impose a de facto carbon tax. Industries would still be free to burn dirty fossil fuels, but they would have to use very expensive, and in some cases nonexistent, new technology to meet emission standards. Or they would have to pay very steep and mounting fines for their emissions. Such penalties could reach thousands of dollars per day, per violation. Thus, a de facto carbon tax. Then cheap fossil fuel energy would become expensive, driving investment toward carbon-neutral forms of clean energy like wind and solar. For extra measure we could end fossil fuel subsidies. Before long, it would be more profitable to invest in clean energy sources than dangerous and filthy ones.¶ Big Green Buy and U.S. “Shadow Socialism”¶ According to clean-tech experts, innovation is now less important than rapid, large-scale implementation. In other words, developing a clean-energy economy is not about new gadgets but about new policies. Most of the energy technologies we need already exist. You know what they are: wind farms, concentrated solar power plants, geothermal and tidal power, all feeding an efficient smart grid that, in turn, powers electric vehicles and radically more energy-efficient buildings.¶ But leading clean technologies remain slightly more expensive than the old dirty-tech alternatives. This “price gap” is holding back the mass application of clean technology. The simple fact is that capitalist economies will not switch to clean energy until it is cheaper than fossil fuel. The fastest way to close the price gap is to build large clean-tech markets that allow for economies of scale. But what is the fastest way to build those markets? More research grants? More tax credits? More clumsy pilot programs?¶ Government procurement is one of the hidden tools of American capitalism’s “shadow socialism.”¶ No. The fastest, simplest way to do it is to reorient government procurement away from fossil fuel energy and toward clean energy and technology—to use the government’s vast spending power to create a market for green energy. Elsewhere, I have called this the Big Green Buy. Consider this: federal, state, and local government constitute more than 38 percent of our GDP. In more concrete terms, Uncle Sam owns or leases more than 430,000 buildings (mostly large office buildings) and 650,000 vehicles. (Add state and local government activity, and all those numbers grow by about a third again.) The federal government is the world’s largest consumer of energy and vehicles, and the nation’s largest greenhouse gas emitter.¶ Government procurement is one of the hidden tools of American capitalism’s “shadow socialism.” By shadow socialism I refer to the massively important but often overlooked role of government planning, investment, subsidy, procurement, and ownership in the economic development of American capitalism. A detailed account of that history is offered in Michael Lind’s book Land of Promise. From railroads, to telecommunications, and aviation and all the attendant sub-industries of these sectors, government has provided the capital and conditions for fledging industries to grow large. For example, government didn’t just fund the invention of the microprocessor; it was also the first major consumer of the device. Throughout the 1950s, more than half of IBM’s revenue came from government contracts. Along with money, these contracts provided a guaranteed market and stability for IBM and its suppliers, and thus attracted private investment—all of which helped create the modern computer industry.¶ Now consider the scale of the problem: our asphalt transportation arteries are clogged with 250 million gasoline-powered vehicles sucking down an annual $200 to $300 billion worth of fuel from more than 121,000 filling stations. Add to that the cost of heating and cooling buildings, jet travel, shipping, powering industry, and the energy-gobbling servers and mainframes that are the Internet, and the U.S. energy economy reaches a spectacular annual tab of 1.2 trillion dollars.¶ A redirection of government purchasing would create massive markets for clean power, electric vehicles, and efficient buildings, as well as for more sustainably produced furniture, paper, cleaning supplies, uniforms, food, and services. If government bought green, it would drive down marketplace prices sufficiently that the momentum toward green tech would become self-reinforcing and spread to the private sector.¶ Executive Order 13514, which Obama signed in 2009, directed all federal agencies to¶ increase energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and storm water management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations.¶ The executive order also stipulates that federal agencies immediately start purchasing 95 percent through green-certified programs and achieve a 28 percent greenhouse gas reduction by 2020. But it has not been robustly implemented.¶ Government has tremendous latitude to leverage green procurement because it requires no new taxes, programs, or spending, nor is it hostage to the holy grail of sixty votes in the Senate. It is simply a matter of changing how the government buys its energy, vehicles, and services. Yes, in many cases clean tech costs more up front, but in most cases, savings arrive soon afterward. And government—because of its size—is a market mover that can leverage money-saving deals if it wishes to. ¶ Protest and the “Relative Autonomy” of the State¶ Why would the capitalist state move to euthanize the fossil fuel industry, that most powerful fraction of the capitalist class? Or put another way, how can the state regain some of its “relative autonomy” from capital? History indicates that massive, crisis-producing protest is one of the most common reasons a modern state will act against the interests of specific entrenched elites and for the “general interest” of society. When the crisis of protest is bad enough, entrenched elites are forced to take a loss as the state imposes ameliorative action for the greater good of society.¶ Clearly, we need to build a well-organized, broadly supported, yet tactically and strategically radical movement to demand proper climate policy. For such a movement to be effective it must use myriad tactics, from lawsuits and lobbying to direct action such as tree-sits, road blockades, and occupations aimed at the infrastructure of the fossil fuel industry. Only by disrupting the working of the political and economic system as a whole can we forge a consensus that ending the fossil fuel sector is essential. (The work of Francis Fox Piven and Richard Cloward is, in my opinion, still among the best in tracing the dynamic of this process of rebellion and reform.)¶ At question, then, is not just the state’s capacity to evolve, but the capacity of the American people to organize and mobilize on a massive scale. Far be it from me to say exactly how such movements could or should be built, other than the way they always have been: by trial and error and with good leadership. Movement building is a mass and organic process.¶ The Rebellion of Nature¶ Along with protest, a more organic source of crisis is already underway and may also help scare political elites into confronting big carbon. Climate change is a “rebellion of nature,” by which I mean the disruption caused by ecological breakdown. The history of environmental regulation in the West is, in many ways, the story of protest and advocacy combining with the rebellion of nature at the local (urban) scale. Together, they have forced rudimentary regulation in the name of health and sanitation.¶ By the 1830s, America’s industrial cities had become perfect incubators of epidemic disease, particularly cholera and yellow fever. Like climate change today, these diseases hit the poor hardest, but they also sickened and killed the wealthy. Class privilege offered some protection, but it was not a guarantee of safety. And so it was that middle-class “goo-goos” and “mugwumps” began a series of reforms that contained and eventually defeated the urban epidemics.¶ First, garbage-eating hogs were banned from city streets, then public sanitation programs of refuse collection began, sewers were built, safe public water provided, and housing codes were developed and enforced. Eventually, the epidemics of cholera stopped. Soon other infectious diseases, such as pulmonary tuberculosis, typhus, and typhoid, were largely eliminated. At the scale of the urban, capitalist society solved an environmental crisis through planning and public investment.¶ Climate change is a problem of an entirely different order of magnitude, but these past solutions to smaller environmental crises offer lessons. Ultimately, solving the climate crisis—like the nineteenth-century victory over urban squalor and epidemic contagions—will require a re-legitimation of the state’s role in the economy.¶ The modern story of local air pollution offers another example of the “rebellion of nature.” As Jim McNeil outlines in Something New Under The Sun, smog inundations in industrial cities of the United States and Europe used to kill many people. In 1879–1880 smog killed 3,000 Londoners, and in Glasgow a 1909 inversion—where cold air filled with smoke from burning coal was trapped near the ground—killed 1,063. As late as 1952, a pattern of cold and still air killed 4,000 people in London, according to McNeil, and even more according to others. By 1956, the Britons had passed a clean air act that drove coal out of the major cities. In the United States there was a similar process. In 1953, smog in New York killed between 170 and 260 people, and as late as 1966 a smog inversion killed 169 New Yorkers. All of this helped generate pressure for the Clean Air Act of 1970.¶ Today, a similar process is underway in China. Local air quality is so bad that it is forcing changes to Chinese energy policy. A major World Bank study has estimated that “the combined health and non-health cost of outdoor air and water pollution for China’s economy comes to around $US 100 billion a year (or about 5.8% of the country’s GDP).” People across China are protesting pollution. Foreign executives are turning down positions in Beijing because of the toxic atmospheric stew that western visitors have taken to calling “airpocalypse.” The film director Chen Kaige, who won the Palme d’Or for his 1993 film Farewell My Concubine, told the world he couldn’t think or make films because of the Chinese capital’s appallingly bad air.¶ These local pressures are a large part of what is driving Chinese investment in renewable energy. Last year China added more energy capacity from wind than from the coal sector.¶ Capitalism vs. Nature?¶ Some of the first thinkers to note a conflict between capitalism and non-human nature were Karl Marx and Friedrich Engels. They came to their ecology through examining the local problem of relations between town and country—expressed simultaneously as urban pollution and rural soil depletion. In exploring this question they relied on the pioneering work of soil chemist Justus von Liebig. And from this small-scale problem, they developed the idea of capitalism creating a rift in the metabolism of natural processes.¶ Here is how Marx explained the dilemma:¶ Capitalist production collects the population together in great centers, and causes the urban population to achieve an ever-growing preponderance. This has two results. On the one hand it concentrates the historical motive force of society; on the other hand, it disturbs the metabolic interaction between man and the earth, i.e., it prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; hence it hinders the operation of the eternal natural condition for the lasting fertility of the soil….All progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil.¶ And as with “soil robbing,” so too concentrations of atmospheric CO2: the natural systems are out of sync; their elements are being rearranged and redistributed, ending up as garbage and pollution.¶ It may well be true that capitalism is incapable of accommodating itself to the limits of the natural world. But that is not the same question as whether or not capitalism can solve the climate crisis. Climate mitigation and adaptation are merely an effort to buy time to address the other larger set of problems that is the whole ecological crisis.¶ This is both a pessimistic and an optimistic view. Although capitalism has not overcome the fundamental conflict between its infinite growth potential and the finite parameters of the planet’s pollution sinks, it has, in the past, addressed specific environmental crises.¶ Anyone who thinks the existing economic system must be totally transformed before we can deal with the impending climate crisis is delusional or in willful denial of the very clear findings of climate science. If the climate system unravels, all bets are off. The many progressive visions born of the Enlightenment will be swallowed and forgotten by the rising seas or smashed to pieces by the wrathful storms of climate chaos.