## 1AC

### Contention One is Warming

#### The best science proves it’s anthropogenic

Muller, 2012 [Richard, professor of physics at the University of California, Berkeley, and a former MacArthur Foundation fellow, “The Conversion of a Climate-Change Skeptic”, http://www.nytimes.com/2012/07/30/opinion/the-conversion-of-a-climate-change-skeptic.html?pagewanted=all]

CALL me a converted skeptic. Three years ago I identified problems in previous climate studies that, in my mind, threw doubt on the very existence of global warming. Last year, following an intensive research effort involving a dozen scientists, I concluded that global warming was real and that the prior estimates of the rate of warming were correct. I’m now going a step further: Humans are almost entirely the cause. My total turnaround, in such a short time, is the result of careful and objective analysis by the Berkeley Earth Surface Temperature project, which I founded with my daughter Elizabeth. Our results show that the average temperature of the earth’s land has risen by two and a half degrees Fahrenheit over the past 250 years, including an increase of one and a half degrees over the most recent 50 years. Moreover, it appears likely that essentially all of this increase results from the human emission of greenhouse gases. These findings are stronger than those of the Intergovernmental Panel on Climate Change [IPCC], the United Nations group that defines the scientific and diplomatic consensus on global warming. In its 2007 report, the I.P.C.C. concluded only that most of the warming of the prior 50 years could be attributed to humans. It was possible, according to the I.P.C.C. consensus statement, that the warming before 1956 could be because of changes in solar activity, and that even a substantial part of the more recent warming could be natural. Our Berkeley Earth approach used sophisticated statistical methods developed largely by our lead scientist, Robert Rohde, which allowed us to determine earth land temperature much further back in time. We carefully studied issues raised by skeptics: biases from urban heating (we duplicated our results using rural data alone), from data selection (prior groups selected fewer than 20 percent of the available temperature stations; we used virtually 100 percent), from poor station quality (we separately analyzed good stations and poor ones) and from human intervention and data adjustment (our work is completely automated and hands-off). In our papers we demonstrate that none of these potentially troublesome effects unduly biased our conclusions. The historic temperature pattern we observed has abrupt dips that match the emissions of known explosive volcanic eruptions; the particulates from such events reflect sunlight, make for beautiful sunsets and cool the earth’s surface for a few years. There are small, rapid variations attributable to El Niño and other ocean currents such as the Gulf Stream; because of such oscillations, the “flattening” of the recent temperature rise that some people claim is not, in our view, statistically significant. What has caused the gradual but systematic rise of two and a half degrees? We tried fitting the shape to simple math functions (exponentials, polynomials), to solar activity and even to rising functions like world population. By far the best match was to the record of atmospheric carbon dioxide (CO2), measured from atmospheric samples and air trapped in polar ice.

#### Fossil fuels are key

Vertessy and Clark3-13**-**2012[Rob, Acting Director of Australian Bureau of Meteorology, and Megan, Chief Executive Officer at the Commonwealth Scientific and Industrial Research Organisation, “State of the Climate 2012”, <http://theconversation.edu.au/state-of-the-climate-2012-5831>]

Carbon dioxide (CO2) emissions account for about 60% of the effect from anthropogenic greenhouse gases on the earth’s energy balance over the past 250 years. These global CO2 emissions are mostly from fossil fuels (more than 85%), land use change, mainly associated with tropical deforestation (less than 10%), and cement production and other industrial processes (about 4%). Australia contributes about 1.3% of the global CO2 emissions. Energy generation continues to climb and is dominated by fossil fuels – suggesting emissions will grow for some time yet. CO2 levels are rising in the atmosphere and ocean. About 50% of the amount of CO2 emitted from fossil fuels, industry, and changes in land-use, stays in the atmosphere. The remainder is taken up by the ocean and land vegetation, in roughly equal parts. The extra carbon dioxide absorbed by the oceans is estimated to have caused about a 30% increase in the level of ocean acidity since pre-industrial times. The sources of the CO2 increase in the atmosphere can be identified from studies of the isotopic composition of atmospheric CO2 and from oxygen (O2) concentration trends in the atmosphere. The observed trends in the isotopic (13C, 14C) composition of CO2 in the atmosphere and the decrease in the concentration of atmospheric O2 confirm that the dominant cause of the observed CO2 increase is the combustion of fossil fuels.

#### 4 degree warming is inevitable with current carbon usage trends – emissions must be reduced

Potsdam Institute, 2012 (Potsdam Institute for Climate Impact Research and Climate Analytics, “Turn Down the Heat: Why a 4°C Warmer World Must be Avoided”, A report for the World Bank, November, http://climatechange.worldbank.org/sites/default/files/Turn\_Down\_the\_heat\_Why\_a\_4\_degree\_centrigrade\_warmer\_world\_must\_be\_avoided.pdf)

The emission pledges made at the climate conventions in Copenhagen and Cancun, if fully met, place the world on a trajectory for a global mean warming of well over 3°C. Even if these pledges are fully implemented there is still about a 20 percent chance of exceeding 4°C in 2100.10 If these pledges are not met then there is a much higher likelihood—more than 40 percent—of warming exceeding 4°C by 2100, and a 10 percent possibility of this occurring already by the 2070s, assuming emissions follow the medium business-as-usual reference pathway. On a higher fossil fuel intensive business-as-usual pathway, such as the IPCC SRESA1FI, warming exceeds 4°C earlier in the 21st century. It is important to note, however, that such a level of warming can still be avoided. There are technically and economically feasible emission pathways that could still limit warming to 2°C or below in the 21st century. To illustrate a possible pathway to warming of 4°C or more, Figure 22 uses the highest SRES scenario, SRESA1FI, and compares it to other, lower scenarios. SRESA1FI is a fossil-fuel intensive, high economic growth scenario that would very likely cause mean the global temperature to exceed a 4°C increase above preindustrial temperatures. Most striking in Figure 22 is the large gap between the projections by 2100 of current emissions reduction pledges and the (lower) emissions scenarios needed to limit warming to 1.5–2°C above pre-industrial levels. This large range in the climate change implications of the emission scenarios by 2100 is important in its own right, but it also sets the stage for an even wider divergence in the changes that would follow over the subsequent centuries, given the long response times of the climate system, including the carbon cycle and climate system components that contribute to sea-level rise. The scenarios presented in Figure 22 indicate the likely onset time for warming of 4°C or more. It can be seen that most of the scenarios remain fairly close together for the next few decades of the 21st century. By the 2050s, however, there are substantial differences among the changes in temperature projected for the different scenarios. In the highest scenario shown here (SRES A1FI), the median estimate (50 percent chance) of warming reaches 4°C by the 2080s, with a smaller probability of 10 percent of exceeding this level by the 2060s. Others have reached similar conclusions (Betts et al. 2011). Thus, even if the policy pledges from climate convention in Copenhagen and Cancun are fully implemented, there is still a chance of exceeding 4°C in 2100. If the pledges are not met and present carbon intensity trends continue, then the higher emissions scenarios shown in Figure 22 become more likely, raising the probability of reaching 4°C global mean warming by the last quarter of this century. Figure 23 shows a probabilistic picture of the regional patterns of change in temperature and precipitation for the lowest and highest RCP scenarios for the AR4 generation of AOGCMS. Patterns are broadly consistent between high and low scenarios. The high latitudes tend to warm substantially more than the global mean. RCP8.5, the highest of the new IPCC AR5 RCP scenarios, can be used to explore the regional implications of a 4°C or warmer world. For this report, results for RCP8.5 (Moss et al. 2010) from the new IPCC AR5 CMIP5 (Coupled Model Intercomparison Project; Taylor, Stouffer, & Meehl 2012) climate projections have been analyzed. Figure 24 shows the full range of increase of global mean temperature over the 21st century, relative to the 1980–2000 period from 24 models driven by the RCP8.5 scenario, with those eight models highlighted that produce a mean warming of 4–5°C above preindustrial temperatures averaged over the period 2080–2100. In terms of regional changes, the models agree that the most pronounced warming (between 4°C and 10°C) is likely to occur over land. During the boreal winter, a strong “arctic amplification” effect is projected, resulting in temperature anomalies of over 10°C in the Arctic region. The subtropical region consisting of the Mediterranean, northern Africa and the Middle East and the contiguous United States is likely to see a monthly summer temperature rise of more than 6°C.

#### Not too late – every reduction key

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We're not yet committed to surpassing 2°C global warming, but as Watson noted, we are quickly running out of time to realistically give ourselves a chance to stay below that 'danger limit'. However, 2°C is not a do-or-die threshold. Every bit of CO2 emissions we can reduce means that much avoided future warming, which means that much avoided climate change impacts. As Lonnie Thompson noted, the more global warming we manage to mitigate, the less adaption and suffering we will be forced to cope with in the future. Realistically, based on the current political climate (which we will explore in another post next week), limiting global warming to 2°C is probably the best we can do. However, there is a big difference between 2°C and 3°C, between 3°C and 4°C, and anything greater than 4°C can probably accurately be described as catastrophic, since various tipping points are expected to be triggered at this level. Right now, we are on track for the catastrophic consequences (widespread coral mortality, mass extinctions, hundreds of millions of people adversely impacted by droughts, floods, heat waves, etc.). But we're not stuck on that track just yet, and we need to move ourselves as far off of it as possible by reducing our greenhouse gas emissions as soon and as much as possible. There are of course many people who believe that the planet will not warm as much, or that the impacts of the associated climate change will be as bad as the body of scientific evidence suggests. That is certainly a possiblity, and we very much hope that their optimistic view is correct. However, what we have presented here is the best summary of scientific evidence available, and it paints a very bleak picture if we fail to rapidly reduce our greenhouse gas emissions. If we continue forward on our current path, catastrophe is not just a possible outcome, it is the most probable outcome. And an intelligent risk management approach would involve taking steps to prevent a catastrophic scenario if it were a mere possibility, let alone the most probable outcome. This is especially true since the most important component of the solution - carbon pricing - can be implemented at a relatively low cost, and a far lower cost than trying to adapt to the climate change consequences we have discussed here (Figure 4).

#### Three Impacts---

#### Agriculture – 4 degrees trumps CO2 benefits

Potsdam Institute, 2012 (Potsdam Institute for Climate Impact Research and Climate Analytics, “Turn Down the Heat: Why a 4°C Warmer World Must be Avoided”, A report for the World Bank, November, http://climatechange.worldbank.org/sites/default/files/Turn\_Down\_the\_heat\_Why\_a\_4\_degree\_centrigrade\_warmer\_world\_must\_be\_avoided.pdf)

The overall conclusions of IPCC AR4 concerning food production and agriculture included the following: • Crop productivity is projected to increase slightly at mid- to high latitudes for local mean temperature increases of up to 1 to 3°C depending on the crop, and then decrease beyond that in some regions (medium confidence) {WGII 5.4, SPM}. • At lower latitudes, especially in seasonally dry and tropical regions, crop productivity is projected to decrease for even small local temperature increases (1 to 2°C) which would increase the risk of hunger (medium confidence) {WGII 5.4, SPM}. • Globally, the potential for food production is projected to increase with increases in local average temperature over a range of 1 to 3°C, but above this it is projected to decrease (medium confidence) {WGII 5.4, 5.5, SPM}. These findings clearly indicate a growing risk for low-latitude regions at quite low levels of temperature increase and a growing risk for systemic global problems above a warming of a few degrees Celsius. While a comprehensive review of literature is forthcoming in the IPCC AR5, the snapshot overview of recent scientific literature provided here illustrates that the concerns identified in the AR4 are confirmed by recent literature and in important cases extended. In particular, impacts of extreme heat waves deserve mention here for observed agricultural impacts (see also Chapter 2). This chapter will focus on the latest findings regarding possible limits and risks to large-scale agriculture production because of climate change, summarizing recent studies relevant to this risk assessment, including at high levels of global warming approaching 4°C. In particular, it will deliberately highlight important findings that point to the risks of assuming a forward projection of historical trends. Projections for food and agriculture over the 21st century indicate substantial challenges irrespective of climate change. As early as 2050, the world’s population is expected to reach about 9 billion people (Lutz and Samir 2010) and demand for food is expected to increase accordingly. Based on the observed relationship between per capita GDP and per capita demand for crop calories (human consumption, feed crops, fish production and losses during food production), Tilman et al. (2011) project a global increase in the demand for crops by about 100 percent from 2005 to 2050. Other estimates for the same period project a 70 percent increase of demand (Alexandratos 2009). Several projections suggest that global cereal and livestock production may need to increase by between 60 and 100 percent to 2050, depending on the warming scenario (Thornton et al. 2011). The historical context can on the one hand provide reassurance that despite growing population, food production has been able to increase to keep pace with demand and that despite occasional fluctuations, food prices generally stabilize or decrease in real terms (Godfray, Crute, et al. 2010). Increases in food production have mainly been driven by more efficient use of land, rather than by the extension of arable land, with the former more widespread in rich countries and the latter tending to be practiced in poor countries (Tilman et al. 2011). While grain production has more than doubled, the area of land used for arable agriculture has only increased by approximately 9 percent (Godfray, Beddington, et al. 2010). However, although the expansion of agricultural production has proved possible through technological innovation and improved water-use efficiency, observation and analysis point to a significant level of vulnerability of food production and prices to the consequences of climate change, extreme weather, and underlying social and economic development trends. There are some indications that climate change may reduce arable land in low-latitude regions, with reductions most pronounced in Africa, Latin America, and India (Zhang and Cai 2011). For example, flooding of agricultural land is also expected to severely impact crop yields in the future: 10.7 percent of South Asia´s agricultural land is projected to be exposed to inundation, accompanied by a 10 percent intensification of storm surges, with 1 m sea-level rise (Lange et al. 2010). Given the competition for land that may be used for other human activities (for example, urbanization and biofuel production), which can be expected to increase as climate change places pressure on scarce resources, it is likely that the main increase in production will have to be managed by an intensification of agriculture on the same—or possibly even reduced—amount of land (Godfray, Beddington et al. 2010; Smith et al. 2010). Declines in nutrient availability (for example, phosphorus), as well as the spread in pests and weeds, could further limit the increase of agricultural productivity. Geographical shifts in production patterns resulting from the effects of global warming could further escalate distributional issues in the future. While this will not be taken into consideration here, it illustrates the plethora of factors to take into account when thinking of challenges to promoting food security in a warming world. New results published since 2007 point to a more rapidly escalating risk of crop yield reductions associated with warming than previously predicted (Schlenker and Lobell 2010; Schlenker and Roberts 2009). In the period since 1980, patterns of global crop production have presented significant indications of an adverse effect resulting from climate trends and variability, with maize declining by 3.8 percent and wheat production by 5.5 percent compared to a case without climate trends. A significant portion of increases in crop yields from technology, CO2 fertilization, and other changes may have been offset by climate trends in some countries (Lobell et al. 2011). This indication alone casts some doubt on future projections based on earlier crop models. In relation to the projected effects of climate change three interrelated factors are important: temperature-induced effect, precipitation-induced effect, and the CO2 -fertilization effect. The following discussion will focus only on these biophysical factors. Other factors that can damage crops, for example, the elevated levels of tropospheric ozone (van Groenigen et al. 2012), fall outside the scope of this report and will not be addressed. Largely beyond the scope of this report are the far-reaching and uneven adverse implications for poverty in many regions arising from the macroeconomic consequences of shocks to global agricultural production from climate change. It is necessary to stress here that even where overall food production is not reduced or is even increased with low levels of warming, distributional issues mean that food security will remain a precarious matter or worsen as different regions are impacted differently and food security is further challenged by a multitude of nonclimatic factors.

#### Biodiversity – 4 degrees overwhelms resilience and adaptation – extinction

Potsdam Institute, 2012 (Potsdam Institute for Climate Impact Research and Climate Analytics, “Turn Down the Heat: Why a 4°C Warmer World Must be Avoided”, A report for the World Bank, November, http://climatechange.worldbank.org/sites/default/files/Turn\_Down\_the\_heat\_Why\_a\_4\_degree\_centrigrade\_warmer\_world\_must\_be\_avoided.pdf)

Ecosystems and their species provide a range of important goods and services for human society. These include water, food, cultural and other values. In the AR4 an assessment of climate change effects on ecosystems and their services found the following: • If greenhouse gas emissions and other stresses continue at or above current rates, the resilience of many ecosystems is likely to be exceeded by an unprecedented combination of change in climate, associated disturbances (for example, flooding, drought, wildfire, insects, and ocean acidification) and other stressors (global change drivers) including land use change, pollution and over-exploitation of resources. • Approximately 20 to 30 percent of plant and animal species assessed so far are likely to be at increased risk of extinction, if increases in global average temperature exceed of 2–3° above preindustrial levels. • For increases in global average temperature exceeding 2 to 3° above preindustrial levels and in concomitant atmospheric CO2 concentrations, major changes are projected in ecosystem structure and function, species’ ecological interactions and shifts in species’ geographical ranges, with predominantly negative consequences for biodiversity and ecosystem goods and services, such as water and food supply. It is known that past large-scale losses of global ecosystems and species extinctions have been associated with rapid climate change combined with other ecological stressors. Loss and/or degradation of ecosystems, and rates of extinction because of human pressures over the last century or more, which have intensified in recent decades, have contributed to a very high rate of extinction by geological standards. It is well established that loss or degradation of ecosystem services occurs as a consequence of species extinctions, declining species abundance, or widespread shifts in species and biome distributions (Leadley et al. 2010). Climate change is projected to exacerbate the situation. This section outlines the likely consequences for some key ecosystems and for biodiversity. The literature tends to confirm the conclusions from the AR4 outlined above. Despite the existence of detailed and highly informative case studies, upon which this section will draw, it is also important to recall that there remain many uncertainties (Bellard, Bertelsmeier, Leadley, Thuiller, and Courchamp, 2012). However, threshold behavior is known to occur in biological systems (Barnosky et al. 2012) and most model projections agree on major adverse consequences for biodiversity in a 4°C world (Bellard et al., 2012). With high levels of warming, coalescing human induced stresses on ecosystems have the potential to trigger large-scale ecosystem collapse (Barnosky et al. 2012). Furthermore, while uncertainty remains in the projections, there is a risk not only of major loss of valuable ecosystem services, particularly to the poor and the most vulnerable who depend on them, but also of feedbacks being initiated that would result in ever higher CO2 emissions and thus rates of global warming. Significant effects of climate change are already expected for warming well below 4°C. In a scenario of 2.5°C warming, severe ecosystem change, based on absolute and relative changes in carbon and water fluxes and stores, cannot be ruled out on any continent (Heyder, Schaphoff, Gerten, & Lucht, 2011). If warming is limited to less than 2°C, with constant or slightly declining precipitation, small biome shifts are projected, and then only in temperate and tropical regions. Considerable change is projected for cold and tropical climates already at 3°C of warming. At greater than 4°C of warming, biomes in temperate zones will also be substantially affected. These changes would impact not only the human and animal communities that directly rely on the ecosystems, but would also exact a cost (economic and otherwise) on society as a whole, ranging from extensive loss of biodiversity and diminished land cover, through to loss of ecosystems services such as fisheries and forestry (de Groot et al., 2012; Farley et al., 2012). Ecosystems have been found to be particularly sensitive to geographical patterns of climate change (Gonzalez, Neilson, Lenihan, and Drapek, 2010). Moreover, ecosystems are affected not only by local changes in the mean temperature and precipitation, along with changes in the variability of these quantities and changes by the occurrence of extreme events. These climatic variables are thus decisive factors in determining plant structure and ecosystem composition (Reu et al., 2011). Increasing vulnerability to heat and drought stress will likely lead to increased mortality and species extinction. For example, temperature extremes have already been held responsible for mortality in Australian flying-fox species (Welbergen, Klose, Markus, and Eby 2008), and interactions between phenological changes driven by gradual climate changes and extreme events can lead to reduced fecundity (Campbell et al. 2009; Inouye, 2008). Climate change also has the potential to facilitate the spread and establishment of invasive species (pests and weeds) (Hellmann, Byers, Bierwagen, & Dukes, 2008; Rahel & Olden, 2008) with often detrimental implications for ecosystem services and biodiversity. Human land-use changes are expected to further exacerbate climate change driven ecosystem changes, particularly in the tropics, where rising temperatures and reduced precipitation are expected to have major impacts (Campbell et al., 2009; Lee & Jetz, 2008). Ecosystems will be affected by the increased occurrence of extremes such as forest loss resulting from droughts and wildfire exacerbated by land use and agricultural expansion (Fischlin et al., 2007). Climate change also has the potential to catalyze rapid shifts in ecosystems such as sudden forest loss or regional loss of agricultural productivity resulting from desertification (Barnosky et al., 2012). The predicted increase in extreme climate events would also drive dramatic ecosystem changes (Thibault and Brown 2008; Wernberg, Smale, and Thomsen 2012). One such extreme event that is expected to have immediate impacts on ecosystems is the increased rate of wildfire occurrence. Climate change induced shifts in the fire regime are therefore in turn powerful drivers of biome shifts, potentially resulting in considerable changes in carbon fluxes over large areas (Heyder et al., 2011; Lavorel et al., 2006) It is anticipated that global warming will lead to global biome shifts (Barnosky et al. 2012). Based on 20th century observations and 21st century projections, poleward latitudinal biome shifts of up to 400 km are possible in a 4° C world (Gonzalez et al., 2010). In the case of mountaintop ecosystems, for example, such a shift is not necessarily possible, putting them at particular risk of extinction (La Sorte and Jetz, 2010). Species that dwell at the upper edge of continents or on islands would face a similar impediment to adaptation, since migration into adjacent ecosystems is not possible (Campbell, et al. 2009; Hof, Levinsky, Araújo, and Rahbek 2011). The consequences of such geographical shifts, driven by climatic changes as well as rising CO2 concentrations, would be found in both reduced species richness and species turnover (for example, Phillips et al., 2008; White and Beissinger 2008). A study by (Midgley and Thuiller, 2011) found that, of 5,197 African plant species studied, 25–42 percent could lose all suitable range by 2085. It should be emphasized that competition for space with human agriculture over the coming century is likely to prevent vegetation expansion in most cases (Zelazowski et al., 2011) Species composition changes can lead to structural changes of the entire ecosystem, such as the increase in lianas in tropical and temperate forests (Phillips et al., 2008), and the encroachment of woody plants in temperate grasslands (Bloor et al., 2008, Ratajczak et al., 2012), putting grass-eating herbivores at risk of extinction because of a lack of food available—this is just one example of the sensitive intricacies of ecosystem responses to external perturbations. There is also an increased risk of extinction for herbivores in regions of drought-induced tree dieback, owing to their inability to digest the newly resident C4 grasses (Morgan et al., 2008). The following provides some examples of ecosystems that have been identified as particularly vulnerable to climate change. The discussion is restricted to ecosystems themselves, rather than the important and often extensive impacts on ecosystems services. Boreal-temperate ecosystems are particularly vulnerable to climate change, although there are large differences in projections, depending on the future climate model and emission pathway studied. Nevertheless there is a clear risk of large-scale forest dieback in the boreal-temperate system because of heat and drought (Heyder et al., 2011). Heat and drought related die-back has already been observed in substantial areas of North American boreal forests (Allen et al., 2010), characteristic of vulnerability to heat and drought stress leading to increased mortality at the trailing edge of boreal forests. The vulnerability of transition zones between boreal and temperate forests, as well as between boreal forests and polar/tundra biomes, is corroborated by studies of changes in plant functional richness with climate change (Reu et al., 2011), as well as analyses using multiple dynamic global vegetation models (Gonzalez et al., 2010). Subtle changes within forest types also pose a great risk to biodiversity as different plant types gain dominance (Scholze et al., 2006). Humid tropical forests also show increasing risk of major climate induced losses. At 4°C warming above pre-industrial levels, the land extent of humid tropical forest, characterized by tree species diversity and biomass density, is expected to contract to approximately 25 percent of its original size [see Figure 3 in (Zelazowski et al., 2011)], while at 2°C warming, more than 75 percent of the original land can likely be preserved. For these ecosystems, water availability is the dominant determinant of climate suitability (Zelazowski et al., 2011). In general, Asia is substantially less at risk of forest loss than the tropical Americas. However, even at 2°C, the forest in the Indochina peninsula will be at risk of die-back. At 4°C, the area of concern grows to include central Sumatra, Sulawesi, India and the Philippines, where up to 30 percent of the total humid tropical forest niche could be threatened by forest retreat (Zelazowski et al., 2011). There has been substantial scientific debate over the risk of a rapid and abrupt change to a much drier savanna or grassland ecosystem under global warming. This risk has been identified as a possible planetary tipping point at around a warming of 3.5–4.5°C, which, if crossed, would result in a major loss of biodiversity, ecosystem services and the loss of a major terrestrial carbon sink, increasing atmospheric CO2 concentrations (Lenton et al., 2008)(Cox, et al., 2004) (Kriegler, Hall, Held, Dawson, and Schellnhuber, 2009). Substantial uncertainty remains around the likelihood, timing and onset of such risk due to a range of factors including uncertainty in precipitation changes, effects of CO2 concentration increase on water use efficiency and the CO2 fertilization effect, land-use feedbacks and interactions with fire frequency and intensity, and effects of higher temperature on tropical tree species and on important ecosystem services such as pollinators. While climate model projections for the Amazon, and in particular precipitation, remain quite uncertain recent analyses using IPCC AR4 generation climate indicates a reduced risk of a major basin wide loss of precipitation compared to some earlier work. If drying occurs then the likelihood of an abrupt shift to a drier, less biodiverse ecosystem would increase. Current projections indicate that fire occurrence in the Amazon could double by 2050, based on the A2 SRES scenario that involves warming of approximately 1.5°C above pre-industrial levels (Silvestrini et al., 2011), and can therefore be expected to be even higher in a 4°C world. Interactions of climate change, land use and agricultural expansion increase the incidence of fire (Aragão et al., 2008), which plays a major role in the (re)structuring of vegetation (Gonzalez et al., 2010; Scholze et al., 2006). A decrease in precipitation over the Amazon forests may therefore result in forest retreat or transition into a low biomass forest (Malhi et al., 2009). Moderating this risk is a possible increase in ecosystem water use efficiency with increasing CO2 concentrations is accounted for, more than 90 percent of the original humid tropical forest niche in Amazonia is likely to be preserved in the 2°C case, compared to just under half in the 4°C warming case (see Figure 5 in Zelazowski et al., 2011) (Cook, Zeng, and Yoon, 2012; Salazar & Nobre, 2010). Recent work has analyzed a number of these factors and their uncertainties and finds that the risk of major loss of forest due to climate is more likely to be regional than Amazon basin-wide, with the eastern and southeastern Amazon being most at risk (Zelazowski et al., 2011). Salazar and Nobre (2010) estimates a transition from tropical forests to seasonal forest or savanna in the eastern Amazon could occur at warming at warming of 2.5–3.5°C when CO2 fertilization is not considered and 4.5–5.5°C when it is considered. It is important to note, as Salazar and Nobre (2010) point out, that the effects of deforestation and increased fire risk interact with the climate change and are likely to accelerate a transition from tropical forests to drier ecosystems. Increased CO2 concentration may also lead to increased plant water efficiency (Ainsworth and Long, 2005), lowering the risk of plant die-back, and resulting in vegetation expansion in many regions, such as the Congo basin, West Africa and Madagascar (Zelazowski et al., 2011), in addition to some dry-land ecosystems (Heyder et al., 2011). The impact of CO2 induced ‘greening’ would, however, negatively affect biodiversity in many ecosystems. In particular encroachment of woody plants into grasslands and savannahs in North American grassland and savanna communities could lead to a decline of up to 45 percent in species richness ((Ratajczak and Nippert, 2012) and loss of specialist savanna plant species in southern Africa (Parr, Gray, and Bond, 2012). Mangroves are an important ecosystem and are particularly vulnerable to the multiple impacts of climate change, such as: rise in sea levels, increases in atmospheric CO2 concentration, air and water temperature, and changes in precipitation patterns. Sea-level rise can cause a loss of mangroves by cutting off the flow of fresh water and nutrients and drowning the roots (Dasgupta, Laplante et al. 2010). By the end of the 21st century, global mangrove cover is projected to experience a significant decline because of heat stress and sea-level rise (Alongi, 2008; Beaumont et al., 2011). In fact, it has been estimated that under the A1B emissions scenario (3.5°C relative to pre-industrial levels) mangroves would need to geographically move on average about 1 km/year to remain in suitable climate zones (Loarie et al., 2009). The most vulnerable mangrove forests are those occupying low-relief islands such as small islands in the Pacific where sea-level rise is a dominant factor. Where rivers are lacking and/ or land is subsiding, vulnerability is also high. With mangrove losses resulting from deforestation presently at 1 to 2 percent per annum (Beaumont et al., 2011), climate change may not be the biggest immediate threat to the future of mangroves. However if conservation efforts are successful in the longer term climate change may become a determining issue (Beaumont et al., 2011). Coral reefs are acutely sensitive to changes in water temperatures, ocean pH and intensity and frequency of tropical cyclones. Mass coral bleaching is caused by ocean warming and ocean acidification, which results from absorption of CO2 (for example, Frieler et al., 2012a). Increased sea-surface temperatures and a reduction of available carbonates are also understood to be driving causes of decreased rates of calcification, a critical reef-building process (De’ath, Lough, and Fabricius, 2009). The effects of climate change on coral reefs are already apparent. The Great Barrier Reef, for example, has been estimated to have lost 50 percent of live coral cover since 1985, which is attributed in part to coral bleaching because of increasing water temperatures (De’ath et al., 2012). Under atmospheric CO2 concentrations that correspond to a warming of 4°C by 2100, reef erosion will likely exceed rates of calcification, leaving coral reefs as “crumbling frameworks with few calcareous corals” (Hoegh-Guldberg et al., 2007). In fact, frequency of bleaching events under global warming in even a 2°C world has been projected to exceed the ability of coral reefs to recover. The extinction of coral reefs would be catastrophic for entire coral reef ecosystems and the people who depend on them for food, income and shoreline. Reefs provide coastal protection against coastal floods and rising sea levels, nursery grounds and habitat for a variety of currently fished species, as well as an invaluable tourism asset. These valuable services to often subsistence-dependent coastal and island societies will most likely be lost well before a 4°C world is reached. The preceding discussion reviewed the implications of a 4°C world for just a few examples of important ecosystems. The section below examines the effects of climate on biological diversity Ecosystems are composed ultimately of the species and interactions between them and their physical environment. Biologically rich ecosystems are usually diverse and it is broadly agreed that there exists a strong link between this biological diversity and ecosystem productivity, stability and functioning (McGrady-Steed, Harris, and Morin, 1997; David Tilman, Wedin, and Knops, 1996)(Hector, 1999; D Tilman et al., 2001). Loss of species within ecosystems will hence have profound negative effects on the functioning and stability of ecosystems and on the ability of ecosystems to provide goods and services to human societies. It is the overall diversity of species that ultimately characterizes the biodiversity and evolutionary legacy of life on Earth. As was noted at the outset of this discussion, species extinction rates are now at very high levels compared to the geological record. Loss of those species presently classified as ‘critically endangered’ would lead to mass extinction on a scale that has happened only five times before in the last 540 million years. The loss of those species classified as ‘endangered’ and ‘vulnerable’ would confirm this loss as the sixth mass extinction episode (Barnosky 2011). Loss of biodiversity will challenge those reliant on ecosystems services. Fisheries (Dale, Tharp, Lannom, and Hodges, 2010), and agronomy (Howden et al., 2007) and forestry industries (Stram & Evans, 2009), among others, will need to match species choices to the changing climate conditions, while devising new strategies to tackle invasive pests (Bellard, Bertelsmeier, Leadley, Thuiller, and Courchamp, 2012). These challenges would have to be met in the face of increasing competition between natural and agricultural ecosystems over water resources. Over the 21st-century climate change is likely to result in some bio-climates disappearing, notably in the mountainous tropics and in the poleward regions of continents, with new, or novel, climates developing in the tropics and subtropics (Williams, Jackson, and Kutzbach, 2007). In this study novel climates are those where 21st century projected climates do not overlap with their 20th century analogues, and disappearing climates are those 20th century climates that do not overlap with 21st century projected climates. The projections of Williams et al (2007) indicate that in a 4°C world (SRES A2), 12–39 percent of the Earth’s land surface may experience a novel climate compared to 20th century analogues. Predictions of species response to novel climates are difficult because researchers have no current analogue to rely upon. However, at least such climates would give rise to disruptions, with many current species associations being broken up or disappearing entirely. Under the same scenario an estimated 10–48 percent of the Earth’s surface including highly biodiverse regions such as the Himalayas, Mesoamerica, eastern and southern Africa, the Philippines and the region around Indonesia known as Wallacaea would lose their climate space. With limitations on how fast species can disperse, or move, this indicates that many species may find themselves without a suitable climate space and thus face a high risk of extinction. Globally, as in other studies, there is a strong association apparent in these projections between regions where the climate disappears and biodiversity hotspots. Limiting warming to lower levels in this study showed substantially reduced effects, with the magnitude of novel and disappearing climates scaling linearly with global mean warming. More recent work by Beaumont and colleagues using a different approach confirms the scale of this risk (Beaumont et al., 2011, Figure 36). Analysis of the exposure of 185 eco-regions of exceptional biodiversity (a subset of the so-called Global 200) to extreme monthly temperature and precipitation conditions in the 21st century compared to 1961–1990 conditions shows that within 60 years almost all of the regions that are already exposed to substantial environmental and social pressure, will experience extreme temperature conditions based on the A2 emission scenario (4.1°C global mean temperature rise by 2100) (Beaumont et al., 2011). Tropical and sub-tropical eco-regions in Africa and South America are particularly vulnerable. Vulnerability to such extremes is particularly acute for high latitude and small island biota, which are very limited in their ability to respond to range shifts, and to those biota, such as flooded grassland, mangroves and desert biomes, that would require large geographical displacements to find comparable climates in a warmer world. The overall sense of recent literature confirms the findings of the AR4 summarized at the beginning of the section, with a number of risks such as those to coral reefs occurring at significantly lower temperatures than estimated in that report. Although non-climate related human pressures are likely to remain a major and defining driver of loss of ecosystems and biodiversity in the coming decades, it is also clear that as warming rises so will the predominance of climate change as a determinant of ecosystem and biodiversity survival. While the factors of human stresses on ecosystems are manifold, in a 4°C world, climate change is likely to become a determining driver of ecosystem shifts and large-scale biodiversity loss (Bellard et al., 2012; New et al., 2011). Recent research suggests that large-scale loss of biodiversity is likely to occur in a 4°C world, with climate change and high CO2 concentration driving a transition of the Earth´s ecosystems into a state unknown in human experience. Such damages to ecosystems would be expected to dramatically reduce the provision of ecosystem services on which society depends (e.g., hydrology—quantity flow rates, quality; fisheries (corals), protection of coastline (loss of mangroves). Barnosky has described the present situation facing the biodiversity of the planet as “the perfect storm” with multiple high intensity ecological stresses because of habitat modification and degradation, pollution and other factors, unusually rapid climate change and unusually high and elevated atmospheric CO2 concentrations. In the past, as noted above, this combination of circumstances has led to major, mass extinctions with planetary consequences. Thus, there is a growing risk that climate change, combined with other human activities, will cause the irreversible transition of the Earth´s ecosystems into a state unknown in human experience (Barnosky et al., 2012).

#### Oceans – 4 degrees trumps resilience

Potsdam Institute, 2012 (Potsdam Institute for Climate Impact Research and Climate Analytics, “Turn Down the Heat: Why a 4°C Warmer World Must be Avoided”, A report for the World Bank, November, http://climatechange.worldbank.org/sites/default/files/Turn\_Down\_the\_heat\_Why\_a\_4\_degree\_centrigrade\_warmer\_world\_must\_be\_avoided.pdf)

The high emission scenarios would also result in very high carbon dioxide concentrations and ocean acidification, as can be seen in Figure 25 and Figure 26. The increase of carbon dioxide concentration to the present-day value of 390 ppm has caused the pH to drop by 0.1 since preindustrial conditions. This has increased ocean acidity, which because of the logarithmic scale of pH is equivalent to a 30 percent increase in ocean acidity (concentration of hydrogen ions). The scenarios of 4°C warming or more by 2100 correspond to a carbon dioxide concentration of above 800 ppm and lead to a further decrease of pH by another 0.3, equivalent to a 150 percent acidity increase since preindustrial levels. Ongoing ocean acidification is likely to have very severe consequences for coral reefs, various species of marine calcifying organisms, and ocean ecosystems generally (for example, Vézina & Hoegh-Guldberg 2008; Hofmann and Schellnhuber 2009). A recent review shows that the degree and timescale of ocean acidification resulting from anthropogenic CO2 emissions appears to be greater than during any of the ocean acidification events identified so far over the geological past, dating back millions of years and including several mass extinction events (Zeebe 2012). If atmospheric CO2 reaches 450 ppm, coral reef growth around the world is expected to slow down considerably and at 550 ppm reefs are expected to start to dissolve (Cao and Caldeira 2008; Silverman et al. 2009). Reduced growth, coral skeleton weakening, and increased temperature dependence would start to affect coral reefs already below 450 ppm. Thus, a CO2 level of below 350 ppm appears to be required for the long-term survival of coral reefs, if multiple stressors, such as high ocean surface-water temperature events, sea-level rise, and deterioration in water quality, are included (Veron et al. 2009). Based on an estimate of the relationship between atmospheric carbon dioxide concentration and surface ocean acidity (Bernie, Lowe, Tyrrell, and Legge 2010), only very low emission scenarios are able to halt and ultimately reverse ocean acidification (Figure 26). An important caveat on these results is that the approach used here is likely to be valid only for relatively short timescales. If mitigation measures are not implemented soon to reduce carbon dioxide emissions, then ocean acidification can be expected to extend into the deep ocean. The calculations shown refer only to the response of the ocean surface layers, and once ocean acidification has spread more thoroughly, slowing and reversing this will be much more difficult. This would further add significant stress to marine ecosystems already under pressure from human influences, such as overfishing and pollution.

**Extinction**

Kristof 6 (NICHOLAS D. KRISTOF, American journalist, author, op-ed columnist, and a winner of two Pulitzer Prizes, “Scandal Below the Surface”, Oct 31, 2006, http://select.nytimes.com/2006/10/31/opinion/31kristof.html?\_r=1, CMR)

If you think of the earth’s surface as a great beaker, then it’s filled mostly with ocean water. It is slightly alkaline, and that’s what creates a hospitable home for fish, coral reefs and plankton — and indirectly, higher up the food chain, for us. But scientists have discovered that the carbon dioxide **(CO2) we’re spewing** into the air doesn’t just heat up the atmosphere and lead to rising seas. Much of that carbon is absorbed by the oceans, and there it produces carbonic acid — the same stuff found in soda pop. That **makes oceans** a bit **more acidic**, impairing the ability of certain shellfish to produce shells, which, like coral reefs, are made of calcium carbonate. A recent article in Scientific American explained the indignity of being a dissolving mollusk in an acidic ocean: “Drop a piece of chalk (calcium carbonate) into a glass of vinegar (a mild acid) if you need a demonstration of the general worry: the chalk will begin dissolving immediately.” The more acidic waters may spell the end, at least in higher latitudes, of some of the tiniest variations of shellfish — certain plankton and tiny snails called pteropods. **This would** **disrupt the food chain,** possibly killing off many whales and fish, and **rippling up all the way to humans**. We stand, so to speak, on the shoulders of plankton. “There have been a couple of very big events in geological history where the carbon cycle changed dramatically,” said Scott Doney, senior scientist at the Woods Hole Oceanographic Institution in Massachusetts. One was an abrupt warming that took place 55 million years ago in conjunction with acidification of the oceans and **mass extinctions**. Most scientists don’t believe we’re headed toward a man-made variant on that episode — not **yet**, at any rate. But many worry that **we’re hurtling into unknown dangers.** “Whether in 20 years or 100 years, I think marine **ecosystems are going to be dramatically different** by the end of this century, **and that’ll lead to extinction events**,” Mr. Doney added. “This is the only habitable planet we have,” he said. “The damage we do is going to be felt by all the generations to come.” So that should be one of the great political issues for this century — the vandalism we’re committing to our planet because of our refusal to curb greenhouse gases. Yet the subject is barely debated in this campaign. Changes in ocean chemistry are only one among many damaging consequences of carbon emissions. Evidence is also growing about the more familiar dangers: melting glaciers, changing rainfall patterns, rising seas and more powerful hurricanes. Last year, the World Health Organization released a study indicating that climate change results in an extra 150,000 deaths and five million sicknesses each year, by causing the spread of malaria, diarrhea, malnutrition and other ailments. A report prepared for the British government and published yesterday, the Stern Review on the Economics of Climate Change, warned that inaction “could create risks of major disruption to economic and social activity, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century.” If emissions are not curbed, climate change will cut 5 percent to 20 percent of global G.D.P. each year, declared the mammoth report. “In contrast,” it said, “the costs of action — reducing greenhouse gas emissions to avoid the worst impacts of climate change — can be limited to around 1 percent of global G.D.P. each year.” Some analysts put the costs of action higher, but most agree that it makes sense to invest far more in alternative energy sources, both to wean ourselves of oil and to reduce the strain on our planet. We know what is needed: a carbon tax or cap-and-trade system, a post-Kyoto accord on emissions cutbacks, and major research on alternative energy sources. But as The Times’s Andrew Revkin noted yesterday, spending on energy research and development has fallen by more than half, after inflation, since 1979.

### Plan – wake

#### The United States federal government should increase statutory restrictions on the War Powers authority of the President by requiring congressional approval before entering armed forces into hostilities to prevent proliferation.

### Contention Two: Solvency

#### Counter-proliferation posture is codified in post-9-11 War Powers authority to preempt – only Congress can check

Gene Healy, 2003. Vice President, CATO Policy Scholars, CATO Institute Handbook for Congress, http://object.cato.org/sites/cato.org/files/serials/files/cato-handbook-policymakers/2003/9/hb108-11.pdf

In some ways, this is nothing new. Throughout the 20th century, congressional control of the war power eroded, not simply as a result of executive¶ branch aggrandizement, but also because of congressional complicity. The imperial presidency continues to grow, largely because many legislators want to duck their responsibility to decide the question of war and peace;¶ delegate that responsibility to the president; and reserve their right to¶ criticize him, should military action go badly.¶ Indeed, even in authorizing the president to use force, Congress¶ attempted to shirk its responsibility to decide on war. After voting for the¶ resolution, which gave the president all the authority he needs to attack¶ Iraq should he choose to do so, prominent members of Congress insisted¶ they hadn’t really voted to use force. That was for the president to decide.¶ As Senate Majority Leader Tom Daschle (D-S.D.) put it: ‘‘Regardless of¶ how one may have voted on the resolution last night, I think there is an¶ overwhelming consensus . . . that while [war] may be necessary, we’re¶ not there yet.’’¶ It is not for the president to decide whether we are ‘‘there yet.’’ The¶ Constitution leaves that question to Congress. Thus far in the war on¶ terror, though, Congress has dodged that responsibility, delegating it to¶ the president. The use-of-force resolution Congress passed immediately¶ after September 11, 2001, contains an even broader delegation of authority to the president, authorizing him to make war on ‘‘those nations, organizations, or persons he determines planned, authorized, committed, or aided¶ the terrorist attacks that occurred on Sept. 11, 2001, or harbored such¶ organizations or persons’’ [emphasis added]. By its plain terms, the resolution leaves it to the president to decide when the evidence that a target¶ nation has cooperated with al-Qaeda justifies war. President Bush has¶ exercised that authority in good faith so far, declining to argue that the¶ flimsy evidence of a Saddam–al-Qaeda connection permits him to attack¶ Iraq under the September 14, 2001, resolution. But if Congress wants a say on whether we should go to war with Iran, Syria, Lebanon, or any¶ number of other nations the president may target in the future, it will have a difficult case to make.¶ Such broad delegations of legislative authority are constitutionally suspect in the domestic arena; surely they are no less so when it comes to¶ questions of war and peace. As Madison put it:¶ Those who are to conduct a war cannot in the nature of things, be proper¶ or safe judges, whether a war ought to be commenced, continued, or¶ concluded. They are barred from the latter functions by a great principle¶ in free government, analogous to that which separates the sword from the¶ purse, or the power of executing from the power of enacting laws [emphasis¶ in original].¶ Preemptive Wars¶ The administration’s new security doctrine, which emphasizes preemptive military strikes, may have equally troubling consequences for congressional control over the war power. Under the new doctrine, rogue nations in the process of developing nuclear, chemical, or biological weapons will be vulnerable at any time to sudden attack by the United States. In a¶ graduation speech given at West Point on June 1, 2002, President Bush¶ discussed the new strategy: ‘‘The war on terror will not be won on the¶ defensive,’’ he said, ‘‘we must take the battle to the enemy . . . [and]¶ be ready for preemptive action when necessary.’’ The administration¶ formalized the policy in the National Security Strategy of the United¶ States of America, released in September. That document does not discuss¶ whether preemptive wars will be conducted pursuant to congressional¶ authorization or launched unilaterally as surprise attacks by the president.¶ In the case of Iraq, which may be the administration’s first preemptive¶ war, the president has not used the doctrine as an excuse to bypass the¶ constitutional requirement of congressional authorization. But the development of the doctrine must be carefully monitored by this Congress and¶ future ones, lest it become a pretext for unilateral presidential war making.¶ Granted, the Constitution does not categorically rule out unilateral military action by the president. No one would argue that, when missiles are¶ in the air or enemy troops are landing on our shores, the president is¶ obliged to call Congress into session before he can respond. As Madison’s¶ notes from the Constitutional Convention make clear, the constitutional consensus about war powers was that, though Congress had the power to ‘‘commence war,’’ the president would have ‘‘the power to repel sudden attacks.’’ Within that power, there’s some latitude for preemptive strikes.¶ If a rogue state plans a nerve gas attack on the New York subway system,¶ the president need not and should not wait until enemy agents are ashore¶ to order military action.¶ But if the preemptive strike doctrine morphs into a freestanding justification for presidential wars, that will have grave consequences for the¶ constitutional balance of power. The doctrine applies whether or not any¶ specific attack on the United States is planned and whether or not U.S.¶ intelligence can establish with any certainty that the target has weapons¶ of mass destruction (WMD). It could be used by this administration or¶ future ones to avoid the inconvenient task of securing authority from¶ Congress. That would change the president’s constitutional power to repel¶ sudden attacks into a dangerous and unconstitutional power to launch¶ sudden attacks.¶ Moreover, such a power would be ripe for abuse. Firm evidence of¶ WMD capability is very hard to come by—indeed, in the case of Iraq,¶ Secretary of Defense Donald Rumsfeld doubts that even an intensive, onthe-ground inspection regime, such as the United Nations operated in Iraq¶ until December 1998, could determine with any degree of certainty what¶ Saddam’s WMD capabilities are. Justifications for preemptive wars will¶ necessarily be speculative and susceptible to manipulation. The potential¶ for politically driven attacks would be enormous.¶ Public opinion polls indicate that Americans view President Bush as a¶ person of integrity and reward him with a high level of public trust. But¶ Bush will not be the last president to wield the broad new powers his¶ administration is forging in the domestic and foreign affairs arenas. As¶ Rumsfeld has noted, the war on terror will take years, and if and when¶ victory is achieved, we may not know with any certainty that we’ve won.¶ Our entire constitutional system repudiates the notion that electing good¶ men is a sufficient check on abuse of power. As President Bush himself¶ noted in his September 17 proclamation: ‘‘In creating our Nation’s Constitutional framework, the Convention’s delegates recognized the dangers¶ inherent in concentrating too much power in one person, branch, or institution.’’ It’s imperative that the 108th Congress resist the tendency to concentrate power and the further growth of the imperial presidency.

#### Obama’s counter-prolif posture is based on the Bush Doctrine interp of war powers authority to preempt

Mathew Waxman, September 11, 2013. “The Most Puzzling Line of the President’s Speech,” http://www.lawfareblog.com/2013/09/the-most-puzzling-line-of-the-presidents-speech/

My first question is to what he’s referring here, or to which part of the past decade. President Bush undoubtedly held very broad views of war powers, but the two major wars embarked up during his presidency, in Afghanistan and Iraq, were clearly congressionally authorized, and Congress has played a significant role in pushing their wind-down. The 2011 Libya intervention, by contrast, was not congressionally authorized, and the Obama administration adopted the view that the War Powers Resolution did not apply to the operations there (which, unlike the contemplated Syria operations, aimed to help bring down a regime). The Obama administration has also resisted the idea that Congress should re-examine the 2001 Authorization for Use of Military Force, which has been interpreted to apply in geographically broad ways that may or may not have been intended by Congress at the time it was adopted. My second question is why, if he believes it’s problematic that more and more war-making power has been put in the hands of the President to the exclusion of Congress, President Obama also adopts the position that he possesses unilateral constitutional authority to act in this case. We haven’t yet seen the underlying legal opinion and analysis, but Jack has pointed out here that in asserting the authority to act independently the Obama administration may be extending, not pulling back on, previous OLC reasoning about presidential power to use force. My third question is about effectiveness. I agree that as a general matter “America acts more effectively abroad when we stand together,” but which is better for the strategic goal Obama lays out here of deterring future chemical weapon use through limited strikes: a more congressionally constrained presidential power or a more flexible one? A President with broad unilateral authority, or a system of strong, formal constitutional checks? I’ve been thinking and writing recently about the relationship between constitutional allocation of war powers and strategies of deterrence or coercive diplomacy, and I believe that even without formally voting to authorize force or not, Congress plays an important role in politically constraining the President and in signaling abroad – to adversaries and allies alike – about our policy preferences and resolve. Part of what worries me about the President’s current approach is that even if the President can win a congressional vote to strike Syria in this instance, the debate so far has shown weak congressional commitment to a global chemical-weapons policing policy – which is what the President claims is important to U.S. security interests (“As the ban against these weapons erodes, other tyrants will have no reason to think twice about acquiring poison gas, and using them”).

#### Statutory restrictions control the perception of force posture – Congressional complicity with Bush doctrine authority implies “green-light” to preempt

Bacevich, 2007 (Andrew, professor of history and international relations at Boston University, “Rescinding the Bush Doctrine”, Boston News, March 1, http://www.boston.com/news/globe/editorial\_opinion/oped/articles/2007/03/01/rescinding\_the\_bush\_doctrine/)

RATHER THAN vainly sniping at President Bush over his management of the Iraq war, the Democratic-controlled Congress ought to focus on averting any recurrence of this misadventure. Decrying the so-called "surge" or curbing the president's authority to conduct ongoing operations will contribute little to that end. Legislative action to foreswear preventive war might contribute quite a lot. Long viewed as immoral, illicit, and imprudent, preventive war -- attacking to keep an adversary from someday posing a danger -- became the centerpiece of US national security strategy in the aftermath of 9/11. President Bush unveiled this new strategy in a speech at West Point in June 2002. "If we wait for threats to fully materialize," he said, "we will have waited too long." The new imperative was to strike before threats could form. Bush declared it the policy of the United States to "impose preemptive, unilateral military force when and where it chooses." Although the Constitution endows the legislative branch with the sole authority to declare war, the president did not consult Congress before announcing his new policy. He promulgated the Bush Doctrine by fiat. Then he acted on it. In 2003, Saddam Hussein posed no immediate threat to the United States; arguing that he might one day do so, the administration depicted the invasion of Iraq as an act of anticipatory self-defense. To their everlasting shame, a majority of members in both the House and the Senate went along, passing a resolution that "authorized" the president to do what he was clearly intent on doing anyway. Implicitly, the Bush Doctrine received congressional endorsement. Events since have affirmed the wisdom of seeing preventive war as immoral, illicit, and imprudent. The Bush administration expected a quick, economical, and decisive victory in Iraq. Advertising the war as an effort to topple a brutal dictator and liberate an oppressed people, it no doubt counted on battlefield success to endow the enterprise with a certain ex post facto legitimacy. Elated Iraqis showering American soldiers with flowers and candies would silence critics who condemned the war as morally unjustified and patently illegal. None of these expectations has come to pass. In its trial run, the Bush Doctrine has been found wanting. Today, Iraq teeters on the brink of disintegration. The war's costs, already staggering, continue to mount. Violence triggered by the US invasion has killed thousands of Iraqi civilians. We cannot fully absolve ourselves of responsibility for those deaths. Our folly has alienated friends and emboldened enemies. Rather than nipping in the bud an ostensibly emerging threat, the Iraq war has diverted attention from existing dangers (such as Al Qaeda) while encouraging potential adversaries (like Iran) to see us as weak. The remedy to this catastrophic failure lies not in having another go -- a preventive attack against Iran, for example -- but in acknowledging that the Bush Doctrine is inherently pernicious. Our reckless flirtation with preventive war qualifies as not only wrong, but also stupid. Indeed, the Bush Doctrine poses a greater danger to the United States than do the perils it supposedly guards against. We urgently need to abrogate that doctrine in favor of principles that reflect our true interests and our professed moral values. Here lies an opportunity for Congress to make a difference. The fifth anniversary of President Bush's West Point speech approaches. Prior to that date, Democratic leaders should offer a binding resolution that makes the following three points: First, the United States categorically renounces preventive war. Second, the United States will henceforth consider armed force to be an instrument of last resort. Third, except in response to a direct attack on the United States, any future use of force will require prior Congressional authorization, as required by the Constitution. The legislation should state plainly our determination to defend ourselves and our allies. But it should indicate no less plainly that the United States no longer claims the prerogative of using "preemptive, unilateral military force when and where it chooses." Declaring the Bush Doctrine defunct will not solve the problems posed by Iraq, but it will reduce the likelihood that we will see more Iraqs in our future. By taking such action, Congress will restore its relevance, its badly tarnished honor, and its standing in the eyes of the American people.

#### Broad development of nuclear energy is slow now – preempting prolif cements the “nuclear suppliers cartel,” killing technology trade and civilian growth

Mueller, 2008 (John, Dept of Political Science at Ohio State University, “The Costs and Consequences of Efforts to Prevent Proliferation”, July 16, http://politicalscience.osu.edu/faculty/jmueller//apsa08.pdf)

The nonproliferation focus has also exacerbated the nuclear waste problem in the United States. In the late 1970s, the Carter administration banned the reprocessing of nuclear fuel, something that radically reduces the amount of nuclear waste, under the highly questionable assumption that this policy would reduce the danger of nuclear proliferation. Nonproliferation efforts worldwide also hamper worldwide economic development by increasing the effective costs of developing nuclear energy--sometimes even making them prohibitive for some countries. As countries grow, they require ever increasing amounts of power. Any measure that limits their ability to acquire this vital commodity--or increases its price--effectively slows economic growth and essentially kills people by reducing the gains in life expectancy commonly afforded by economic development. The Non-Proliferation Treaty specifically guarantees to signing nonnuclear countries "the fullest possible exchange of technology" for the development of peaceful nuclear power. However, as Richard Betts points out, this rationale has been undermined by the development of a "nuclear suppliers cartel" which has worked to "cut off trade in technology for reprocessing plutonium or enriching uranium," thereby reducing the NPT to "a simple demand to the nuclear weapons have-nots to remain so."49 More broadly the nonproliferation quest has from time to time boosted international oil prices to the detriment of almost all the countries in the world except for the potential proliferator. Because nuclear power does not emit greenhouse gases, it is an obvious potential candidate for helping with the problem of global warming, an issue many people hold to be of the highest concern for the future of the planet.

#### Aff signal encourages suppliers – dual-use tech raises security flags – US posture is the number one factor in willingness to assist developing nuclear powers

Kate Davidson, UNE Business School Faculty of the Professions, University of New England, 2012. “Contemporary Perspectives on Nuclear Proliferation,” http://www.une.edu.au/\_\_data/assets/pdf\_file/0008/24110/econwp12-2.pdf

The role of the United States in matters of proliferation cannot be emphasised enough. In the Cold War period, the foreign policies of both the US and the Soviet Union were by and large premised upon nuclear matters and necessarily shaped the nuclear field we are faced with today. Post Cold War, US policy has dominated international interactions. The US does contribute enormously to the development of norms; however its own influence extends beyond and almost independently of these norms. In typical “do as I say, not as I do” style, the US exerts huge pressures on states to follow the path of non-proliferation despite their own attachment to nuclear weapons. Levite (2002/03, p76) acknowledges the “glaring omission” in the literature of a “systematic assessment of the vast array of non-proliferation instruments and assets employed by the United States across the cases of nuclear restraint and reversal”, mounting a convincing argument36 based on the claim that “an understanding with the United States is, in fact, a hallmark of many cases of nuclear slowdown or reversal” (p82). She contends that the US is least influential in effecting the nature of domestic regimes which shape nuclear ambitions, concluding that “success is within reach only to the extent that foreign influence and domestic conditions converge, and the foreign effort is closely tuned (in terms of both agenda and timing) to the domestic context” (p87). While the mechanisms by which the US asserts its influence are many and varied37, the hegemon’s role in non-proliferation is deemed to be fundamental.¶ Following on from this, since the US has been so willing to “purchase” non- proliferation through various means perhaps this leads states to making small developments towards the nuclear end which they can then “sell” in order to enhance their economic or diplomatic standing. Japan and North Korea have been implicated in such actions, and it is certainly a notion worth some consideration. It is also possible that Israel’s unwillingness to admit its own nuclear status is in part that doing so may compromise its foreign aid flows, particularly from the US.¶ The second and related issue of vital significance is the role of sanctions, both positive and negative, in non-proliferation measures. While such actions are inextricably linked with US policy and superpower, the theoretical grounding is markedly different. Quite fortunately for the purpose of this discussion, the very recent publishing of the book ‘Sanctions, Statecraft, and Nuclear Proliferation’ edited by Solingen (2012) addresses this very subject. While the authors focus largely on specific causal mechanisms, domestic distributional costs and benefits remain at the forefront and provide insight as to how sanctions and inducements, either targeted or comprehensive, can actually have unintended consequences, particularly given varying domestic political economy models and regime types.¶ As noted by Stein (2012, p30) although “sanctions are as old as antiquity”, they are more prevalent now than ever, but “ironically, sanctions can weaken a state absolutely¶ but also strengthen it relatively (to its society and domestic opposition)” (p55). That is, sanctions may actually support the regime which is driving a nuclear program and thereby strengthen its support – a counterproductive action by any standards. Similarly, Kreps and Pasha argue that military threats may make “good politics” domestically (p175), but empirically support the hypothesis that “military threats reinforce the coalitions that are hostile to international economic integration and cooperation with international regimes more generally” (p208) – the very regimes which Solingen argues are most likely to nuclearise.¶ Tying in with the initial point of discussion in this section, Nincic (2012) rethinks the US counter proliferation policy with regard to inducements, intuitively noting that “few measures could be fully effective when not initiated, or at least supported, by the world’s sole superpower” (p127). Observing the “abysmal failure and frequently counterproductive character of threats and punishment” (p153), Nincic pushes the role of positive engagement in non-proliferation measures. In a less US-centric rationale, Drezner (2012) claims “that more comprehensive economic sanctions – or more wide ranging inducements – will often be more likely to lead to the desired policy changes” than ‘smart sanctions’ which are specifically targeted to reduce externalities (p155).¶ The consistent failure of sanctions to procure desired outcomes is a theme throughout the various chapters. Solingen concludes by outlining three factors which burden the probability that sanctions would have the desired effects in the nuclear realm (2012, p347):¶ 1. Inward looking autocracies, being the most frequent targets of these sanctions, are also the least vulnerable to them.¶ 2. Selection bias results as “sanctions are expected to surface only when targets believe that concessions would risk regime survival more than defiance”. That is, targets receptive to inducements may pre-empt sanctions, leaving analysis of sanctions largely on inward-looking autocracies which “appear to be endogenous to why sanctions emerge as tools of statecraft to begin with”.¶ 3. Inward looking autocracies may price nuclear weapons markedly highly, justified as public goods, making them more resistant to comply with non-proliferation demands.¶ To illustrate the common use of these tools, Figure 6 shows the number of sanctions and inducements directed toward the four main targets of the period 1990 to 2009: North Korea, Libya, Iraq and Iran. From this the relative use of sanctions versus inducements for each target can be recognised, as can the dominance of the US in the utilisation of these tools. Other senders depicted in the legend of the Figure are non- US unilateral (Uni), United Nations (UN), and non-UN multilateral (Multi). It is also interesting to note that 78% of sanctions in the past three decades were imposed on non-democratic target states38, which gives rise to a possibility that perhaps discriminate treatment of non-democratic regimes by more powerful nations may provide incentive for nuclear weapon acquisition by the weaker state in a struggle for power. Or in other words, economic mistreatment gives rise to a perception of threatened security, which under the assumption of realism will provide motivation for nuclear weapon acquisition.¶ With Iran’s nuclear ambitions being so enthusiastically repressed at present, a few brief points are worth mentioning – the most obvious being that the huge numbers of sanctions have not worked. Stein notes the need to create an “international sanctioning cartel”39 can often “multilateralize an initial bilateral conflict” (p41). Unilateral sanctions are often ineffective or difficult to implement on their own and thus allies in sanctioning will often be sought. Drezner (2012, p167) points out that Iran “has been under some form of embargo for its entire existence, and the regime has grown comfortable with them”. Nader (2012) examines Iran in greater depth, finding it to be unclear whether sanctions have impacted Iran’s willingness to pursue its nuclear program but also suggesting the nation may actually thrive on a sense of political and economic isolation stemming from its ideology (p214). He concludes: “The regime’s survival is increasingly contingent on a favourable outcome regarding the nuclear program, whether it leads to a virtual or actual nuclear weapons capability. A sanctions regime contributing to Iran’s economic decline cannot alter this reality.” (p231)¶ A third point with regard to external incentives is, again, tied in tightly with the other two but worthy of mention: institutional organisations. A number of institutional non- proliferation measures have been already discussed: these include the IAEA, the UN, regional NWFZs and various other multilateral treaties. Through encouraging membership to these institutions and also utilising mechanisms under these structures, external pressure can be applied to nations in order to discourage them from developing nuclear weapons programs. The role of the US, and the use of sanctions and inducements by various nations, are both major features of any such institution, however, given the complex web of globalised trade and business patterns which have developed across the globe, the interactions of such institutions needs to be considered. ¶ While the subject of external incentives has focussed rather heavily on¶ discouraging proliferation, such circumstances may exist under which external pressures act in favour of nuclearisation. Aggressive marketing by nuclear technology companies may lead a nation down the path of nuclear energy, only to find its “Siamese twin” comes too**.** This now leads into the supply side explanation of ¶ proliferation. ¶ Access to nuclear technology: more able leads to more willing ¶ This theory of nuclear proliferation is a relatively new development in the literature40 ¶ and represents the supply side, positing that a state’s ability to build nuclear weapons ¶ will influence its probability of actually doing so. As nuclear technology has spread ¶ over the globe41¶ ¶ , the technical means of developing nuclear weapons has also spread ¶ through the dual purpose nature of the technology. The technical links between ¶ civilian nuclear facilities and military programs have previously been discussed, as has ¶ the notion of a virtual nuclear state, and it is important to remember that “whether or ¶ not a state wants a nuclear weapons is irrelevant if it is unable to acquire them” ¶ (Kroenig, 2009 p163). However, as many as fifty states could be considered to be ¶ nuclear weapons capable (Hymans, 2010 p13). The puzzle then is to explain the gap ¶ between the number of states which are technically capable of developing nuclear ¶ weapons and the number which actually choose to do so. Supply side theories seem to ¶ have relied heavily on empirical analysis, and as a result some of the quantitative ¶ proliferation literature will now be introduced to this discussion. ¶ Initially, there is a requirement that nuclear capability be defined. The possession of a ¶ nuclear reactor is obviously the first point required for a state to even be considered ¶ nuclear capable, however this is by no means sufficient. Contemporary literature has ¶ built on Meyer’s (1984) landmark book ‘The Dynamics of Nuclear Proliferation’ and ¶ Stoll’s (1996) revision of this data (cited in Sagan, 2011 p228). In defining nuclear ¶ latency, Meyer measured ten technical and economic indicators – previous national ¶ mining activity, indigenous uranium deposits, metallurgists, steel production, ¶ construction work force, chemical engineers, nitric acid production, electrical ¶ production capacity, nuclear engineers, physicists, chemists and explosives and ¶ electronics specialists42¶ ¶ . As neither the quantity or quality of a state’s nuclear ¶ engineers nor its explosives and electronics specialists could be accurately determined ¶ as being sufficient to develop a nuclear weapon, Meyer used two proxy indicators: ¶ whether the state had been operating a research reactor for three reactor years and ¶ whether the state manufactured automobiles, or assembled automobiles and ¶ manufactured radios and television sets. Based on these indicators, Meyer concluded ¶ that 34 states had the latent capability of building nuclear weapons in 1982 (cited in ¶ Sagan, 2011 p229). ¶ Stoll’s (1996) revision of the data set assumed that all states had access to nuclear ¶ materials since they were (purportedly) available on the open market, and thus ¶ “assumed away the crucial technical bottleneck of whether a state has access to ¶ uranium that, once enriched, could be used in a nuclear weapons program” (Sagan, ¶ 2011 p229). Stoll’s updated data set led to the conclusion that 48 states had latent ¶ weapons capability in 1992. ¶ ¶ Real world events brought supply side issues to the forefront of the proliferation ¶ debate and the 9/11 attack on the United States highlighted the potential role of non-¶ state actors in international conflict. Furthermore, the uncovering of the AQ Khan ¶ network of supplying nuclear equipment and knowledge, and the apparent ¶ nuclearisation of North Korea (more on these later) demonstrated that supply chains ¶ of nuclear material and technology were out of control, and the notion of second tier ¶ proliferation became a subject for debate. Braun and Chyba (2004) point to three ¶ challenges to the non-proliferation regime: ¶ ¶ i. Latent proliferation under the Non-proliferation Treaty ¶ ¶ ii. First tier nuclear proliferation, in which technology or material is ¶ stolen from private companies or state nuclear programs assists ¶ non-nuclear weapon states develop illegal programs ¶ ¶ iii. Second tier proliferation in which states in the developing world with ¶ varying technical capabilities trade amongst themselves to bolster ¶ one another’s nuclear and strategic weapons efforts ¶ ¶ They explore the proliferation “ring” formed by strategic alliances and trade occurring ¶ between and among a list of nations, most notably Pakistan, North Korea, Libya, Iran ¶ and Iraq. This inspired a greater focus on the supply of nuclear technology globally ¶ and more pertinently, the need to better understand the relationship between access ¶ to nuclear technology and materials, and weapons proliferation itself. ¶ ¶ Data coding applied to proliferation studies were further developed by Jo and Gartzke ¶ (2007), who considered the determinants of nuclear proliferation in terms of ¶ opportunity and willingness (p168). On the supply-side, they further organised ¶ opportunity into three categories (p169): the set of technologies related to the ¶ manufacture of nuclear weapons, nuclear fissile materials, and economic capacity. ¶ They then devised three variables upon which to base their analysis (Jo and Gartzke, ¶ 2007 p172-3). First, latent nuclear weapons production capability was constructed by ¶ summing resource and production capacities using seven components: uranium ¶ deposits, metallurgists, chemical engineers, and nuclear ¶ engineers/physicists/chemists, electronic/explosive specialists, nitric acid production ¶ capacity, and electricity production capacity. Second, economic capacity was ¶ constructed using data relating to states’ energy consumption and iron/steel ¶ production. Third, diffusion of knowledge of how to build nuclear weapons was ¶ assumed to occur, and quantified using a log transformation of years passed since ¶ 1938. The dependent variables were dichotomous and coded annually: NWEAPON ¶ identified whether states had a nuclear weapon in the given year, and NPROGRAM a ¶ nuclear weapons program. ¶ ¶ In relation to nuclear proliferation opportunity, they found that latent nuclear ¶ production capabilities increased the predicted probability of having a weapons ¶ program, but did not impact the conditional decision to produce weapons. ¶ Furthermore they concluded that barriers to proliferation ease with the diffusion of ¶ time. This data set was a significant step in the quantitative approach to proliferation ¶ studies and is very widely cited, thus warrants discussion here despite doing little to ¶ actually define nuclear latency. Their measure of nuclear latency was a simple scale ¶ from zero to seven reflecting the seven components of the index. Sagan (2011, p229) ¶ is quite critical of Jo and Gartzke’s coding, claiming the failure to treat possession of ¶ fissile materials as necessary for nuclear capability as inadequate. The shortcomings¶ of their coding rules are evidenced by the fact that North Korea and South Africa are ¶ both considered to not have full capability to develop weapons in 200143¶ ¶ (ibid). ¶ More recently, the supply side proliferation literature has explored the relationship between civilian nuclear assistance and nuclear proliferation. Matthew Fuhrmann has contributed enormously to the proliferation literature to this end44. He explored the determinants of dual-use trade (2008), defining dual-use commodities as having two ¶ applications: “they can be used in weapons of mass destruction (WMD) programs but ¶ also have many legitimate civilian applications” (p634). With most governments placing restrictions on the export of such commodities he was able to analyse licensed dual-use exports from the US between 1991 and 2001 (post Cold War era). He concludes his research to be “preliminary support for the assertion that states channel dual-use trade towards destinations where security guarantees exist and away from targets where security threats are present to minimise its potentially negative security externalities” 45¶ ¶ (p648). Following from this, Fuhrmann (2009a) explores whether the diffusion of knowledge makes proliferation more likely and further examines the determinants of civilian nuclear cooperation (2009b). These works tie in with the ¶ research of Matthew Kroenig, another significant contributor on the topic of nuclear ¶ assistance.

#### It’s reverse-causal – supplier perception is key to nuclear expansion – secure financing trumps obstacles

Sharon Squassoni, director and se- nior fellow of the Proliferation Prevention Program at the Center for Strategic and International Studies (CSIS). Prior to joining CSIS, she was a senior asso- ciate in the Nuclear Nonproliferation Program at the Carnegie Endowment for International Peace, December 2010. “Mapping Nuclear Power’s Future Spread, ” NUCLEAR POWER’S GLOBAL EXPANSION: WEIGHING ITS COSTS AND RISKS Henry Sokolski Editor, online

The largest increases in nuclear capacity in the next 20-30 years undoubtedly will occur in Asia, specifically, China, Japan, South Korea, and India. These countries are building nuclear power plants now and anticipate continued high economic growth levels. Other countries could feel the pinch of the current financial crisis more acutely, dampening demand for electricity below anticipated levels. A major expansion of nuclear power across the board, however, is not a foregone conclusion.¶ In addition, the traditional challenges besetting nuclear energy—cost, safety, waste, and proliferation—will likely continue to limit widespread growth. Government policies supporting nuclear energy in the future—as has been the case in the past—would be necessary to make major expansion a reality.¶ For many states, cost is the first and most immediate obstacle to nuclear expansion. But in those states where there is heavy involvement by the government in electricity markets, supporting nuclear energy may be as simple as providing government funding or financing. Solutions to nuclear waste tend to be deferred into the future, but policies by major suppliers to take back spent fuel could provide some incentives for growth. In states seeking nuclear power for the first time, actions to develop what some have termed the “three Ss”—safeguards, safety, and security— could improve their attractiveness to nuclear vendors. In all countries, some limits on, or costs attached to, carbon dioxide emissions could help enhance the attractiveness of nuclear power, but these should also enhance the attractiveness of renewable sources of energy as well.

#### Status quo scares demand, too – wannabe nuclear power states perceive preemption as the norm

Henry Sokolski Executive Director¶ The Nonproliferation Policy Education Center, Editor, December 2010. NUCLEAR POWER’S GLOBAL EXPANSION: WEIGHING ITS COSTS AND RISKS, online

With commercial nuclear energy projects, especially those exported overseas, there is a major additional worry—nuclear energy’s link to nuclear weapons proliferation. Here, the security risks are real, particularly in the Middle East. Israel, the United States, Iran, and Iraq have launched aerial bombing or missile strikes against reactors at Osirak in Iraq and Bushehr in Iran, even though Iraq and Iran were members of the Nu- clear Nonproliferation Treaty (NPT) and the attacked reactors were under International Atomic Energy Agency (IAEA) safeguards. If one includes the 2007 Israeli strike against Syria’s reactor and Iraq’s failed missile attack against Dimona during the first Gulf War, there have been no fewer than 13 acts of war directed against IAEA member state reactors. Such facts should put a security premium on efforts to subsidize the construction of such projects both here and abroad. Certainly, the more the U.S. and other advanced economies go out of their way to use gov- ernment financial incentives to promote the expansion of nuclear power programs domestically or overseas, the more difficult it is likely to be to dissuade devel- oping nations from making similar investments. This dynamic will exist even if the nuclear projects in ques- tion are clearly uncompetitive with nonnuclear alter- natives. Moreover, we should be trying to discourage subsidies that substantially assist these states to move closer to developing nuclear weapons options.

#### States pursue nuclear capacity in a dead zone of i-law – plan would be a clear legal check on force

Cristian DeFrancia was a legal adviser at the Iran–United States Claims Tribunal in The Hague from 2005 to 2012. 2012. “Enforcing the Nuclear Nonproliferation Regime: The Legality of Preventive Measures,” online, vanderbilt journal of transnational law [vol. 45:705]

International law is highly restrictive on the use of force by states without Security Council authorization. The scope of self- defense to justify unilateral action on a preemptive basis has been thoroughly vetted through debates relating to the Iraq War, which have done little to produce consensus.401 In the meantime, jurists continue to facilitate an ever-widening gap by promoting impracticably broad offensive restrictions and narrow defensive permissions for the use of force. In the defensive context, as Theresa Reinold notes, a divergence has already resulted between state practice and international law doctrine.402 Where preventive force is concerned, the doctrine of anticipatory self-defense has gained little traction as a basis for justifying unilateral force.403 The concept of an “imminent” attack remains confined in nineteenth century conceptions, as articulated in the Caroline case.404 Notwithstanding Ian Brownlie’s early 1963 recognition that, due to the advent of long- range missiles in a state of readiness, “the difference between attack and imminent attack may now be negligible,”405 carving out a doctrine of anticipatory self-defense that does not eviscerate the prohibition on the use of force has historically been an unworkable proposition. Thus, unilateral preventive force does not occupy a sound position under the current scheme of international law. In the context of low-level conflict, numerous quandaries on the law of force surface. It is unclear, for example, whether targeted killings of Iranian nuclear scientists should be a matter of Iranian domestic law or a question of international humanitarian law. In the absence of an attribution of responsibility for such acts, it is difficult to prove a nexus to international conflict, inviting the question— similarly posed in the context of terrorism—of whether such isolated acts should be considered primarily a criminal law matter. Moreover, under prevailing standards on the use of force, isolated killings would likely not be considered an armed attack meriting the invocation of self-defense under Article 51 of the UN Charter.406 Forcible reprisals for such targeted killings would therefore be problematic under international law. The absence of clear-cut legal standards in the context of low-level conflict suggests that international law is ill- equipped to deal with such situations. Assuming that a state suspected of developing nuclear weapons is the victim of an unlawful use of force targeting the cessation of that activity, the suspect state may face the grim reality of having no effective remedy. Although international law does not excuse the unlawful use of force in the context of a counterproliferation strategy, a state that has been isolated as a result of its alleged interests in developing a nuclear weapon may be in the awkward situation of having little support in the collective security apparatus for addressing low-level uses of force. One prominent example is the attack on the Dair Alzour/Ali Kibar nuclear site in Syria in 2007 and the ensuing silence of the international community. At the time of the attack, both the attacker and the nature of the facility attacked remained unclear, though it later became clear that Israel launched the attack.407 The international response to the attack at Dair Alzour was relatively muted,408 with no Security Council condemnation (in contrast with Israel’s 1982 attack on the Iraqi Osirak reactor, which was condemned by the Security Council in Resolution 487).409 On May 24, 2011, the IAEA concluded on the basis of environmental samples, satellite imagery, photographs, and other assessments that the facility was likely a nuclear reactor that should have been declared to the Agency.410 The IAEA Board of Governors referred the matter to the Security Council on June 9, 2011.411 Although it’s widely understood that the airstrikes on Dair Alzour were an unlawful use of force, it is also undisputed that the muted reaction signals an increasing lack of global political concern regarding the legality of such low-level uses of force when the target state is outside of international norms regarding nuclear policy.412 The closest corollary in legal doctrine that captures the international community’s muted response to the Dair Alzour strikes is found in the doctrine of “clean hands,”413 or the principle that “an unlawful act cannot serve as the basis of an action in law.”

#### The prolif dilemma underlies all nuclear energy development – relaxing posture is key to safe distribution at a scale large enough to solve warming

Squassoni, 2009 (Sharon, Senior associate at the Carnegie Endowment for International Peace focusing on nuclear nonproliferation and national security, “Nuclear Power: How Much More?” Nuclear Policy Education Center, March 25, http://www.npolicy.org/article.php?aid=176&rid=2)

The amount of nuclear capacity required to make a signification contribution to global climate change mitigation is so large that it would inevitably be widely distributed across the globe. Such a distribution would have particular implications for nuclear proliferation. However, projected distributions of nuclear energy out to 2050 are extremely speculative. The industry itself does not engage in such projections, and countries that set nuclear energy production goals have a history of widely missing long-range targets, such as China and India. The discussion below considers a hypothetical distribution of nuclear energy for 2050, based on the 2003 MIT Study. [12] Scenario III, shown in Figure 7, uses the “High 2050” scenario in Appendix 2 (“Global Electricity Demand and the Nuclear Power Growth Scenario”) of the 2003 MIT study, The Future of Nuclear Power. Although this is not a distribution designed to achieve optimal CO2 reductions, it is expansion at a level significant enough (1500 GWe) to have an effect on CO2 emissions. This would mean a fourfold increase from current reactor capacity. The MIT study used an underlying assumption that the developed countries would continue with a modest annual increase in per capita electricity use and the developing countries would move to the 4000 kWh per person per year benchmark if at all feasible (the 4000 kWh benchmark being the dividing line between developed and advanced countries). Electricity demand was then pegged to estimated population growth. Finally, it was assumed that nuclear energy would retain or increase its current share of electricity generation. The least-off developing countries were assumed in the MIT study not to have the wherewithal for nuclear energy. It should be noted that MIT’s 2050 projection was “an attempt to understand what the distribution of nuclear power deployment would be if robust growth were realized, perhaps driven by a broad commitment to reducing greenhouse gas emissions and a concurrent resolution of the various challenges confronting nuclear power’s acceptance in various countries.” A few countries that the MIT High 2050 case included but are not included here are countries that currently have laws restricting nuclear energy, such as Austria. Implications for Uranium Enrichment A fourfold expansion of nuclear energy would entail significant new production requirements for uranium enrichment as shown in Figure 8 and possibly, reprocessing. The MIT study anticipated that 54 states would have reactor capacities that could possibly justify indigenous uranium enrichment. If a capability of 10 GWe is considered the threshold at which indigenous enrichment becomes cost-effective, more than 15 additional states could find it advantageous to engage in uranium enrichment. Figure 9 depicts what the geographic distribution of enrichment capacity might look like, based on the development of 10 GWe or more of reactor capacity. Of course, some states – such as Australia or Kazakhstan – might opt to enrich uranium regardless of domestic nuclear energy capacity, choosing to add value to their own uranium exports. In addition, states may choose to take the path of the UAE, which has formally renounced domestic enrichment and reprocessing in its domestic law, despite aspiring to reach 10 GWe of capacity. Ultimately, these decisions lie very much in the political realm, and can be reversed. Implications for Proliferation Proliferation experts generally fall into two camps – those that do not consider power reactors a cause for proliferation concern but focus on the sensitive aspects of the nuclear fuel cycle and those that are concerned about the entire fuel cycle. Advocates of nuclear energy point out that most states that have developed nuclear weapons have used dedicated production or research reactors rather than power reactors to produce their fissile material [13]; others point to the potential for a state to use peaceful nuclear power to further a clandestine weapons program, either through technology transfer, hiding clandestine activities within a peaceful nuclear fuel cycle or diverting lightly irradiated fuel to be further enriched. Regardless of one’s views on the proliferation risks of power reactors, the recent surge of enthusiasm for nuclear energy poses several proliferation risks. First, recent enthusiasm is not limited just to power reactors. On the enrichment side, President Bush’s 2004 initiative to limit capabilities to current technology holders failed, not just in strategy but also in tactics. For example, Argentina, Canada, and South Africa have all expressed an interest in keeping their enrichment options open. Brazil, which is commissioning a new centrifuge enrichment plant at Resende, will likely produce more low-enriched uranium than is needed for its own consumption by 2015. By and large, these countries do not produce nuclear energy on at scale large enough to make domestic enrichment capability economic. [14] However, they have keen national interests in maintaining their right to enrich. Faced with allied objections to restricting future options, the Bush Administration folded. This is partly the reason for the impasse at the NSG on further detailed criteria restricting enrichment and reprocessing. A perception of the U.S. approach as discriminatory could open the door to further challenges. Even if piecemeal efforts to limit the number of states with uranium-enrichment or spent fuel reprocessing capabilities succeed, these could ultimately further erode the NPT by extending the existence of haves and have-nots from nuclear weapons into the nuclear fuel cycle. In the short term, efforts to limit expansion could slow some states’ implementation of the safeguards-strengthening measures in the 1997 Model Additional Protocol. In the long term, other decisions to strengthen the NPT could be jeopardized. On the reprocessing end, the United States has recently embraced spent fuel reprocessing at home and abroad. From the Global Nuclear Energy Partnership (GNEP) to nuclear cooperation with India, Bush administration policies supported reprocessing. This is a complete reversal from the policies adopted in the mid-1970s not to encourage the use of plutonium in the civilian fuel cycle. A nuclear renaissance that embraces reprocessing as necessary to reduce spent fuel accumulation could result in more plutonium in transit, providing more potential targets for diversion. A renaissance that includes widespread installation of fast reactors would similarly increase targets for diversion. Although GNEP advocates stress that the kind of spent fuel “conditioning” they favor would not result in the separation of plutonium, there are few assurances thus far that new techniques are any more proliferation-resistant than PUREX. As opponents like to point out, no future fuel conditioning technique in the United States will be more proliferation resistant than storing spent fuel. And while most countries are probably interested in having someone else solve the problem either of spent fuel storage or high-level waste storage, no commercial reprocessing service currently will store high-level waste. Neither the United States, nor Russia, nor France has committed to taking back spent fuel under GNEP. A further question is whether the next generation of reactors will be more or less proliferation-resistant than existing reactors. As of December 2002, the Generation IV Forum had not yet adopted a standard methodology for evaluating proliferation resistance and physical protection for the six systems under consideration. In addition, there have been a few reports that India is considering exporting its Pressurized Heavy Water Reactors. India may not be the only state in a second tier of suppliers that might be interested in exporting reactors, injecting some uncertainty into assessments. Beyond the technical realm, there are very real political questions about widespread diffusion of civilian nuclear power. Would new nuclear states would raise proliferation concerns by virtue of their geographic location, the existence of terrorist groups on their soil, or other sources of political instability? Would expanded nuclear infrastructure in Egypt, Jordan, Indonesia, Malaysia, Morocco, Nigeria, Vietnam, and the GCC countries lead their neighbors to worry about and respond to the possibility that these countries will develop weapons programs? The expansion of nuclear power would also have practical consequences for the nuclear nonproliferation regime. Additional facilities will place additional safeguards requirements on IAEA inspectors It is unclear how the IAEA will meet these requirements – will these mean more inspection days or will other approaches be used under the “integrated safeguards” program? Although reactors themselves require relatively few inspection days, there will be significant work in helping prepare new nuclear states for nuclear power programs. Already, the IAEA has conducted workshops on infrastructure requirements, including energy needs and planning considerations; nuclear security and safeguards; physical infrastructure; current and future reactor technology; experience in developing nuclear programs; human resource requirements; and public perceptions. States must also develop their states systems of accounting and control. A nuclear expansion, in particular, that results in more states with bulk-handling facilities (enrichment and reprocessing) could place significant strain on the IAEA and the inspections system. Recent experience suggest that current methods of inspection cannot provide timely detection. The fact that the IAEA’s goals for timely detection are clearly longer than material conversion times – that is, the time it would take for a proliferator to produce finished metal shapes – is a big concern. The largest enrichment and reprocessing plants under safeguards now are under EURATOM safeguards; the IAEA’s role in verifying material balances in those plants is limited by the IAEA-EURATOM agreement. The only experience in safeguarding commercial-scale enrichment and reprocessing plants outside of EURATOM in a non-nuclear-weapon state is in Japan, where incidents with significant material losses have raised questions. British commercial reprocessing at the THORP facility also has produced recurring reports of significant materials losses. Perhaps the largest question about a nuclear expansion is whether or not planned technological developments will outpace nonproliferation initiatives, such as fuel supply assurances and multinational fuel-cycle centers, voluntary export guidelines, and further restrictions within the Nuclear Suppliers Group. Criticism of the U.S. GNEP program had been aimed in part at the aggressive timeline for technology demonstration of advanced reprocessing, in contrast to developments more closely tied to nonproliferation objectives, such as supporting more proliferation-resistant reactors with sealed fuel cores that would limit handling of fuel. Already, efforts to manage expansion of the front and back ends of the fuel cycle, whether nuclear fuel assurances, fuel banks, or fuel leasing projects, have abandoned any concepts of formal restraints in favor of incentives. It is too soon to tell how compelling those incentives will be. Finally, although there is disagreement among experts about the proliferation potential of light water reactors, it is clear that the proliferation potential of a country with no nuclear expertise is lower than that of a country with nuclear power and its associated infrastructure. The current encouraging climate for nuclear energy – new cooperation agreements between France and the UAE, Libya and Algeria, and between the United States and Turkey and Jordan, for a few – suggests that regardless of global climate change concerns, or whether or not a significant expansion occurs, some states in the Middle East will develop nuclear energy. It is not clear whether new nuclear reactors in the Middle East would result in new enrichment or reprocessing plants in the Middle East. In part, much depends on the outcome of negotiations with Iran on its enrichment capabilities. If states clearly renounce making nuclear fuel and allow sufficient wide- ranging inspections to verify such pledges, the proliferation implications could be significantly diminished. The hope is that this can be accomplished with the UAE.

#### Nuclear power is necessary to avoid four degrees warming

Comeau 3-12-20’13

[Steve, a database programmer and a member of Local Motion, a Burlington-based group that promotes people-powered transportation, “Comeau: Nuclear power can be tool in avoiding global warming”, http://vtdigger.org/2013/03/12/comeau-nuclear-power-can-be-tool-in-avoiding-global-warming/]

Nuclear power is used to generate electricity, primarily replacing the use of coal for that purpose. In the two years since the Fukushima-Daiichi nuclear facility disaster hundreds of thousands of people worldwide have died from air pollution related to burning coal. According to the World Health Organization, “Urban outdoor air pollution is estimated to cause 1.3 million deaths worldwide per year.” Much of that pollution can be attributed to coal, which accounts for over 40 percent of electricity generated in the world. Burning coal produces massive amounts of waste products including fly ash, sulfur dioxide, mercury, and other heavy metals. Burning coal is bad for the environment and human health. But the biggest issue with burning coal is that it is the largest contributor of CO2 emissions, and therefore a huge contributor to human-caused global warming. To make progress on reducing CO2 emissions related to global warming, coal needs to stay in the ground. Of course there are many political and economic forces that make this close to impossible, but it can only be done if the electricity produced by coal is replaced. The replacements available for that purpose are natural gas, renewable energy, and nuclear power. These all have issues and risks, but are far cleaner and with fewer health consequences than coal. There are many interesting developments that will allow nuclear power to be safer, produce less waste, and even use up the existing nuclear waste. Bill Gates is promoting a company called TerraPower, developing the Traveling Wave Reactor. Environmentalist Stewart Brand, editor of the Whole Earth Catalog, supports nuclear power and the development of integral fast reactors that use uranium more efficiently and can use waste from other reactors. James Hansen, a leading climate scientist and now an activist, also supports third- and fourth-generation nuclear reactors as a way to avert climate change. The projections from a variety of sources depict that CO2 emissions will decline slowly in the United States and likely continue to increase around the world — so pretty much a “business-as-usual” scenario. A report by PricewaterhouseCoopers, “Too late for two degrees,” shows that in 2001 the world energy related emissions grew by 3 percent. China’s emissions grew by 9.4 percent, but emissions in the United States dropped by 1.9 percent, in part due to a mild winter. The most revealing and useful metric is the CO2 measurements taken at the Mauna Loa Observatory in Hawaii since 1959. Based on the trend of the CO2 measurements over the past 20 years, the atmospheric CO2 level — currently at 396 ppm (parts per million) — will reach 450 ppm in 2034. This is approximately the level of CO2 where the average global temperature will increase by 2 degrees (3.6 degrees F) over the pre-industrial level. Based on the latest climate change science, disruptive climate change is occurring now and will continue to occur with increased warming. That part is certain. What is uncertain is the intensity and timing of the transition to dangerous climate change, the threshold which is thought to be 2 degrees C of warming over the pre-industrial level. According to a report published in November 2012 by the World Bank, titled “Turn Down the Heat — Why a 4℃ Warmer World Must be Avoided,” if the current commitments and pledges for reducing emissions are not fully implemented, warming of 4 degrees C (7.2 degrees F) could occur as early as the 2060s. This level of warming will likely produce enormous environmental harm, as well as social and economic disruption. I encourage everyone to download and read this World Bank report. We need a greater understanding and appreciation of the magnitude of the projected harm that dangerous climate change can cause. People will adapt to climate change, but that adaptation will include migration and displacement that is orders of magnitude greater than that caused by the Fukushima-Daiichi nuclear facility disaster. That adaptation will include the abandonment of large cities flooded by a rising sea and migration from regions parched by drought. The warming and CO2 levels will last for centuries and change the world ecosystems. To postpone or avert the greatest harm from climate change it is necessary to accept the risks and potential harm that come with nuclear power, renewable energy, and natural gas, because the alternative is so much worse. The environmentalist positions against the energy technologies that offer effective solutions for replacement of coal are not helpful. As stated in the World Bank report: “The projected 4℃ warming must not be allowed to occur — the heat must be turned down.”

#### Other sources fail

Cohen, 2012

[Armond, Executive Director, Clean Air Task Force, 2-13, “Decarbonization: The Nuclear Option,” http://energy.nationaljournal.com/2012/02/is-america-poised-for-nuclear.php?print=true&printcomment=2161670]

Just on its face, this is a tall order. The capital investment is jaw-dropping, and it is becoming increasingly difficult to site new energy projects, regardless of whether they are solar or wind farms, transmission lines, CCS infrastructure, shale gas drilling, or nuclear facilities. More subtly, integrating these various energy sources—especially balancing output of intermittent renewables in an electric grid with no significant ability to store energy—is a major challenge; it is far from certain it can even be done at very large scale. To maximize our odds of meeting the target, we will need to prioritize development and deployment of technologies that appear capable of growing economically to full scale.Cheap unscrubbed natural gas is a “McSolution” to the problem—tempting, but probably not the healthiest long-term choice. In order to make a major contribution to climate abatement, methane emissions from natural gas production and distribution will need to be reduced, and gas-fired power plants will need to use CCS technologies. And, although gas in the United States today is sold at prices below production costs, that cannot continue for long, especially in increasingly international markets. Similarly**,** “soft energy paths” like PV power (also sometimes today sold below cost) will need significant grid support and zero-carbon balancing to generate meaningful emission reductions. The economic supply curve for large, attractive sites for these projects is bound to bend sharply upwards over time as well. In this context, nuclear power has potentially significant advantages to offer: It is demonstrably low-carbon; it provides baseload energy; unlike wind and solar, it has high power density; and, although gas is cheap today, the price of new nuclear power appears to approach that of new coal. Perhaps more importantly, the price of new nuclear plants will decline as years pass. Standardization will lead to some cost reductions; factory assembly of small, modular units could bring about further step-change reductions (as it has for automobiles and airplanes) in production costs. None of this means that nuclear is poised for a renaissance in the United States. Utilities and their regulators won’t argue with $3 gas, Congress is unwilling to put a price on carbon, and some people remain vehemently opposed to nuclear energy. Ultimately, however, nuclear energy isprobably an indispensible element of any credible plan to substantially decarbonize the country. The Nuclear Regulatory Commission’s recent approval of the new Westinghouse reactor design is good news in this regard, as it should help revitalize the American nuclear industry and keep it moving on a path of continuous improvement. In the longer term, a host of newer technologies, including passively cooled small reactors, gas-cooled reactors, and reactors with liquid fuels offer significant potential for further improvements in cost and safety. The country would do well to support continued development and deployment of these designs. In an ideal world, we might wait to scale up nuclear power until after we’ve exhausted all efficiency and renewables options. Unfortunately, however, we don’t have decades to do this, even if we thought traditional green sources would eventually fill the zero-carbon void, which seems unrealistic. Half of the CO2 emitted today will still be warming the planet 1,000 years from now, and these legacy emissions won’t erase themselves. We need to develop all low-carbon energy options now to hedge against the risk of serious climate consequences; nuclear power, despite its genuine challenges, cannot be left off the table.

### Contention Three: Warming Outweighs

#### Uncertainty means vote aff – at 4 degrees, our ability to predict exactly what will happen and adapt is minimal

Kim, 2012 (Dr. Jim Yong, President of the World Bank Group, “Turn Down The heat: why a 4°C warmer world must be avoided”, November, World Bank, http://climatechange.worldbank.org/sites/default/files/Turn\_Down\_the\_heat\_Why\_a\_4\_degree\_centrigrade\_warmer\_world\_must\_be\_avoided.pdf)

It is my hope that this report shocks us into action. Even for those of us already committed to fighting climate change, I hope it causes us to work with much more urgency. This report spells out what the world would be like if it warmed by 4 degrees Celsius, which is what scientists are nearly unanimously predicting by the end of the century, without serious policy changes. The 4°C scenarios are devastating: the inundation of coastal cities; increasing risks for food production potentially leading to higher malnutrition rates; many dry regions becoming dryer, wet regions wetter; unprecedented heat waves in many regions, especially in the tropics; substantially exacerbated water scarcity in many regions; increased frequency of high-intensity tropical cyclones; and irreversible loss of biodiversity, including coral reef systems. And most importantly, a 4°C world is so different from the current one that it comes with high uncertainty and new risks that threaten our ability to anticipate and plan for future adaptation needs. The lack of action on climate change not only risks putting prosperity out of reach of millions of people in the developing world, it threatens to roll back decades of sustainable development. It is clear that we already know a great deal about the threat before us. The science is unequivocal that humans are the cause of global warming, and major changes are already being observed: global mean warming is 0.8°C above pre industrial levels; oceans have warmed by 0.09°C since the 1950s and are acidifying; sea levels rose by about 20 cm since pre-industrial times and are now rising at 3.2 cm per decade; an exceptional number of extreme heat waves occurred in the last decade; major food crop growing areas are increasingly affected by drought. Despite the global community’s best intentions to keep global warming below a 2°C increase above pre-industrial climate, higher levels of warming are increasingly likely. Scientists agree that countries’ current United Nations Framework Convention on Climate Change emission pledges and commitments would most likely result in 3.5 to 4°C warming. And the longer those pledges remain unmet, the more likely a 4°C world becomes. Data and evidence drive the work of the World Bank Group. Science reports, including those produced by the Intergovernmental Panel on Climate Change, informed our decision to ramp up work on these issues, leading to, a World Development Report on climate change designed to improve our understanding of the implications of a warming planet; a Strategic Framework on Development and Climate Change, and a report on Inclusive Green Growth. The World Bank is a leading advocate for ambitious action on climate change, not only because it is a moral imperative, but because it makes good economic sense. But what if we fail to ramp up efforts on mitigation? What are the implications of a 4°C world? We commissioned this report from the Potsdam Institute for Climate Impact Research and Climate Analytics to help us understand the state of the science and the potential impact on development in such a world. It would be so dramatically different from today’s world that it is hard to describe accurately; much relies on complex projections and interpretations. We are well aware of the uncertainty that surrounds these scenarios and we know that different scholars and studies sometimes disagree on the degree of risk. But the fact that such scenarios cannot be discarded is sufficient to justify strengthening current climate change policies. Finding ways to avoid that scenario is vital for the health and welfare of communities around the world. While every region of the world will be affected, the poor and most vulnerable would be hit hardest. A 4°C world can, and must, be avoided. The World Bank Group will continue to be a strong advocate for international and regional agreements and increasing climate financing. We will redouble our efforts to support fast growing national initiatives to mitigate carbon emissions and build adaptive capacity as well as support inclusive green growth and climate smart development. Our work on inclusive green growth has shown that—through more efficiency and smarter use of energy and natural resources—many opportunities exist to drastically reduce the climate impact of development, without slowing down poverty alleviation and economic growth. This report is a stark reminder that climate change affects everything. The solutions don’t lie only in climate finance or climate projects. The solutions lie in effective risk management and ensuring all our work, all our thinking, is designed with the threat of a 4°C degree world in mind. The World Bank Group will step up to the challenge.

#### No great power war – organizations, alliances, diplomacy

Robb 12—Lieutenant, US Navy (Doug, Why the Age of Great Power War is Over, [www.usni.org/magazines/proceedings/2012-05/now-hear-why-age-great-power-war-over](http://www.usni.org/magazines/proceedings/2012-05/now-hear-why-age-great-power-war-over), CMR)

Whereas in years past, when nations allied with their neighbors in ephemeral bonds of convenience, today’s global politics are tempered by permanent international organizations, regional military alliances, and formal economic partnerships. Thanks in large part to the prevalence of liberal democracies, these groups are able to moderate international disputes and provide forums for nations to air grievances, assuage security concerns, and negotiate settlements—thereby making war a distant (and distasteful) option. As a result, China (and any other global power) has much to lose by flouting international opinion, as evidenced by its advocacy of the recent Syrian uprising, which has drawn widespread condemnation.¶ In addition to geopolitical and diplomacy issues, globalization continues to transform the world. This interdependence has blurred the lines between economic security and physical security. Increasingly, great-power interests demand cooperation rather than conflict. To that end, maritime nations such as the United States and China desire open sea lines of communication and protected trade routes, a common security challenge that could bring these powers together, rather than drive them apart (witness China’s response to the issue of piracy in its backyard). Facing these security tasks cooperatively is both mutually advantageous and common sense.¶ Democratic Peace Theory—championed by Thomas Paine and international relations theorists such as New York Times columnist Thomas Friedman—presumes that great-power war will likely occur between a democratic and non-democratic state. However, as information flows freely and people find outlets for and access to new ideas, authoritarian leaders will find it harder to cultivate popular support for total war—an argument advanced by philosopher Immanuel Kant in his 1795 essay “Perpetual Peace.”¶ Consider, for example, China’s unceasing attempts to control Internet access. The 2011 Arab Spring demonstrated that organized opposition to unpopular despotic rule has begun to reshape the political order, a change galvanized largely by social media. Moreover, few would argue that China today is not socially more liberal, economically more capitalistic, and governmentally more inclusive than during Mao Tse-tung’s regime. As these trends continue, nations will find large-scale conflict increasingly disagreeable.¶ In terms of the military, ongoing fiscal constraints and socio-economic problems likely will marginalize defense issues. All the more reason why great powers will find it mutually beneficial to work together to find solutions to common security problems, such as countering drug smuggling, piracy, climate change, human trafficking, and terrorism—missions that Admiral Robert F. Willard, former Commander, U.S. Pacific Command, called “deterrence and reassurance.”¶ As the Cold War demonstrated, nuclear weapons are a formidable deterrent against unlimited war. They make conflict irrational; in other words, the concept of mutually assured destruction—however unpalatable—actually had a stabilizing effect on both national behaviors and nuclear policies for decades. These tools thus render great-power war infinitely less likely by guaranteeing catastrophic results for both sides. As Bob Dylan warned, “When you ain’t got nothing, you ain’t got nothing to lose.”¶ Great-power war is not an end in itself, but rather a way for nations to achieve their strategic aims. In the current security environment, such a war is equal parts costly, counterproductive, archaic, and improbable.

#### No nuclear war – deterrence

Tepperman 2009 [Deputy Editor at Newsweek. Frmr Deputy Managing Editor, Foreign Affairs. LLM, i-law, NYU. MA, jurisprudence, Oxford. (Jonathan, Why Obama Should Learn to Love the Bomb, <http://jonathantepperman.com/Welcome_files/nukes_Final.pdf>, CMR]

The argument that nuclear weapons can be agents of peace as well as destruction rests on two deceptively simple observations. First, nuclear weapons have not been used since 1945. Second, there’s never been a nuclear, or even a nonnuclear, war between two states that possess them. Just stop for a second and think about that: it’s hard to overstate how remarkable it is, especially given the singular viciousness of the 20th century. As Kenneth Waltz, the leading “nuclear optimist” and a professor emeritus of political science at UC Berkeley puts it, “We now have 64 years of experience since Hiroshima. It’s striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states.” To understand why—and why the next 64 years are likely to play out the same way—you need to start by recognizing that **all states are rational** on some basic level. **Their leaders** may be stupid, petty, venal, even evil, but they **tend to do things** only when **they’re** pretty **sure they can get away with** them. Take war: a country will start a fight only when it’s almost certain it can get what it wants at an acceptable price. Not even Hitler or Saddam waged wars they didn’t think they could win. The problem historically has been that leaders often make the wrong gamble and underestimate the other side—and millions of innocents pay the price. Nuclear weapons change all that by making the costs of war obvious, inevitable, and unacceptable. Suddenly, when both sides have the ability to turn the other to ashes with the push of a button— and everybody knows it—the basic math shifts. Even the craziesttin-pot dictator is forced to accept that war with a nuclear state is unwinnable and thus not worth the effort. As Waltz puts it, “Why fight if you can’t win and might lose everything?” Why indeed? The iron logic of deterrence and mutually assured destruction is so compelling, it’s led to what’s known as the nuclear peace: the virtually unprecedented stretch since the end of World War II in which all the world’s major powers have avoided coming to blows. They did fight **proxy wars**, ranging from Korea to Vietnam to Angola to Latin America. But these **never matched** the furious destruction of full-on, **great-power war** (World War II alone was responsible for some 50 million to 70 million deaths). And since the end of the Cold War, such bloodshed has declined precipitously. Meanwhile, the nuclear powers have scrupulously avoided direct combat, and there’s very good reason to think they always will. There have been some near misses, but a close look at these cases is fundamentally reassuring—because in each instance, very different leaders all came to the same safe conclusion. Take the mother of all nuclear standoffs: the Cuban missile crisis. For 13 days in October 1962, the United States and the Soviet Union each threatened the other with destruction. But both **countries** soon **stepped back** from the brink **when they recognized** that **a war would** have **mean**t curtains for everyone. As important as the fact that they did is the reason why: Soviet leader Nikita Khrushchev’s aide Fyodor Burlatsky said later on, “It is impossible to win a nuclear war, and both sides realized that, maybe for the first time.” The record since then shows the same pattern repeating: **nuclear** armed **enemies** slide toward war, then **pull back**, always for the same reasons. The best recent example is India and Pakistan, which fought three bloody wars after independence before acquiring their own nukes in 1998. Getting their hands on weapons of mass destruction didn’t do anything to lessen their animosity. But it did dramatically mellow their behavior. Since acquiring atomic weapons, the two sides have never fought another war, despite severe provocations (like Pakistani-based terrorist attacks on India in 2001 and 2008). They have skirmished once. But during that flare-up, in Kashmir in 1999, both countries were careful to keep the fighting limited and to avoid threatening the other’s vital interests. Sumit Ganguly, an Indiana University professor and coauthor of the forthcoming India, Pakistan, and the Bomb, has found that on both sides, officials’ thinking was strikingly similar to that of the Russians and Americans in 1962. The prospect of war brought Delhi and Islamabad face to face with a nuclear holocaust, and leaders in each country did what they had to do to avoid it.

#### Miscalc is impossible

Quinlan 2009 (Sir Michael, visiting professor at King's College London, Permanent Under-Secretary at the Ministry of Defence and former senior fellow at the International Institute of Strategic Studies, “Thinking About Nuclear Weapons: Principles, Problems, Prospects,” Oxford University Press, CMR)

One special form of miscalculation appeared sporadically in the speculations of academic commentators, though it was scarcely ever to be encountered—at least so far as my own observation went—in the utterances of practical planners within government. This is the idea that nuclear war might be erroneously triggered, or erroneously widened, through a state under attack misreading either what sort of attack it was being subjected to, or where the attack came from. The postulated misreading of the nature of the attack referred in particular to the hypothesis that if a delivery system—normally a missile—that was known to be capable of carrying either a nuclear or a conventional warhead was launched in a conventional role, the target country might, on detecting the launch through its early warning systems, misconstrue the mission as an imminent nuclear strike and immediately unleash a nuclear counter-strike of its own. This conjecture was voiced, for example, as a criticism of the proposals for giving the US Trident SLBM, long associated with nuclear missions, a capability to deliver conventional warheads. Whatever the merit of those proposals (it is not explored here), it is hard to regard this particular apprehension as having any real-life credibility. The ﬂight time of a ballistic missile would not exceed about thirty minutes, and that of a cruise missile a few hours, before arrival on target made its character—conventional or nuclear—unmistakable. No government will need, and no nonlunatic government could wish, to take within so short a span of time a step as enormous and irrevocable as the execution of a nuclear strike on the basis of early-warning information alone without knowing the true nature of the incoming attack. The speculation tends moreover to be expressed without reference either to any realistic political or conﬂict-related context thought to render the episode plausible, or to the manifest interest of the launching country, should there be any risk of doubt, in ensuring—by explicit communication if necessary—that there was no misinterpretation of its conventionally armed launch.

#### Interdependence checks

Deudney 2009 (Daniel Prof of Pol Sci, and Ikenberry, Prof of International Affairs, and John, Prof of Pol Sci at John Hopkins and Prof of International Affairs at Princeton, “Why Liberal Democracy Will Prevail” <http://www.nwc.navy.mil/events/csf/readings/AutocraticRevival.aspx>, CMR)

 This bleak outlook is based on an exaggeration of recent developments and ignorespowerful countervailing factors and forces. Indeed, contrary to what the revivalists describe, the most striking features of the contemporary international landscape are the intensification of economic globalization, thickening institutions, and shared problems of interdependence. The overall structure of the international system today is quite unlike that of the nineteenth century. Compared to older orders, the contemporary liberal-centered international order provides a set of constraints and opportunities — of pushes and pulls — that reduce the likelihood of severe conflict while creating strong imperatives for cooperative problem solving. Those invoking the nineteenth century as a model for the twenty-first also fail to acknowledge the extent to which war as a path to conflict resolution and great-power expansion has become largely obsolete. Most important, nuclear weapons have transformed great-power war from a routine feature of international politics into an exercise in national suicide. With all of the great powers possessing nuclear weapons and ample means to rapidly expand their deterrent forces, warfare among these states has truly become an option of last resort. The prospect of such great losses has instilled in the great powers a level of caution and restraint that effectively precludes major revisionist efforts. Furthermore, the diffusion of small arms and the near universality of nationalism have severely limited the ability of great powers to conquer and occupy territory inhabited by resisting populations (as Algeria, Vietnam, Afghanistan, and now Iraq have demonstrated). Unlike during the days of empire building in the nineteenth century, states today cannot translate great asymmetries of power into effective territorial control; at most, they can hope for loose hegemonic relationships that require them to give something in return. Also unlike in the nineteenth century, today the density of trade, investment, and production networks across international borders raises even more the costs of war. A Chinese invasion of Taiwan, to take one of the most plausible cases of a future interstate war, would pose for the Chinese communist regime daunting economic costs, both domestic and international. Taken together**,** these changes in the economy of violence mean that the international system is far more primed for peace than the autocratic revivalists acknowledge.

#### Nuclear war doesn’t cause extinction

Socol 2011Yehoshua (Ph.D.), an inter-disciplinary physicist, is an expert in electro-optics, high-energy physics and applications, and material science and Moshe Yanovskiy, Jan 2, “Nuclear Proliferation and Democracy”, http://www.americanthinker.com/2011/01/nuclear\_proliferation\_and\_demo.html, CMR

Nuclear proliferation should no longer be treated as an unthinkable nightmare; it is likely to be the future reality. Nuclear weapons have been acquired not only by an extremely poor per capita but large country such as India, but also by even poorer and medium-sized nations such as Pakistan and North Korea. One could also mention South Africa, which successfully acquired a nuclear arsenal despite economic sanctions (the likes of which have not yet been imposed on Iran). It is widely believed that sanctions and rhetoric will not prevent Iran from acquiring nuclear weapons and that many countries, in the Middle East and beyond, will act accordingly (see, e.g., recent Heritage report). Nuclear Warfare -- Myths And Facts The direct **consequences of** the limited **use of** **nuclear weapons** -- especially low-yield devices most likely to be in the hands of non-state actors or irresponsible governments -- **would** probably **not be great** enough to bring about significant geopolitical upheavals. Casualties from a single 20-KT nuclear device **are** estimated [1] at about 25,000 fatalities with a similar number of injured, assuming a rather unfortunate scenario (the center of a large city, with minimal warning). Scaling the above toll to larger devices or to a larger number of devices is less than linear. For example, it has been estimated that it would take as many as eighty devices of 20-KT yield each to cause 300,000 civilian fatalities in German cities (a result actually achieved by Allied area attacks, or carpet-bombings, during the Second World War). A single 1-MT device used against Detroit has been estimated by U.S. Congress OTA to result in about 220,000 fatalities. It is anticipated that well-prepared **civil defense measures**, based on rather simple presently known techniques, would **decrease** these **numbers by** maybe **an order of magnitude** (as will be discussed later). There is little doubt that **a nation determined to survive** and with a strong sense of its own destiny **would not succumb to** such **losses**. It is often argued that the **fallout** effects of even the limited use of nuclear weapons would be worldwide and would last for generations. This **is** an exaggeration. The following facts speak for themselves. -- **In Japan**, as assessed by REFR, **less than 1,000** excess **cancer cases** (i.e., above the natural occurrence) **were recorded in** over **100,000 survivors** over the past sixty years -- compared with about 110,000 immediate fatalities in the two atomic bombings. No clinical or even sub-clinical effects were discovered in the survivors' offspring. -- In the Chernobyl area, as assessed by IAEA, only fifteen cancer deaths can be directly attributed to fallout radiation. No radiation-related increase in congenital formations was recorded. Nuclear Conflict -- Possible Scenarios With reference to a possible regional nuclear conflict between a rogue state and a democratic one, the no-winner (mutual assured destruction) scenario is probably false. An analysis by Anthony Cordesman, et al. regarding a possible Israel-Iran nuclear conflict estimated that while Israel might survive an Iranian nuclear blow, Iran would certainly not survive as an organized society. Even though the projected casualties cited in that study seem to us overstated, especially as regards Israel, the conclusion rings true. **Due to the** extreme high **intensity** ("above-conventional") of **nuclear conflict**, it is nearly certain that such a war, no matter its outcome, would not lastfor years**,** as we have become accustomed to in current low-intensity conflicts. Rather, we should **anticipate** a new geo-political reality: the emergence of clear **winners** and losers within several days, or at most weeks after the initial outbreak of hostilities. This latter reality will most probably contain fewer nuclear-possessing states than the former.

**No nuke winter – studies**

Seitz 2011 (Russell, Harvard University Center for International Affairs visiting scholar, “Nuclear winter was and is debatable,” Nature, 7-7-11, Vol 475, pg37, accessed 9-27-11, CMR)

Alan Robock's contention that there has been no real scientific debate about the 'nuclear winter' concept is itself debatable (Nature 473, 275–276; 2011). This **potential climate disaster**, popularized in Science in 1983, **rested on** the output of **a one-dimensional model that** was later shown to **overestimate** the smoke a nuclear holocaust might engender. More refined estimates, combined with advanced three-dimensional models (see http://go.nature.com.libproxy.utdallas.edu/kss8te), have dramatically reduced the extent and severity of the projected cooling. Despite this, Carl Sagan, who co-authored the 1983 Science paper, went so far as to posit “the extinction of Homo sapiens” (C. Sagan Foreign Affairs 63, 75–77; 1984). **Some regarded this** apocalyptic **prediction as** **an exercise in mythology**. George **Rathjens of** the Massachusetts Institute of Technology **protested: “Nuclear winter is** **the worst example of the misrepresentation of science** to the public **in my memory**,” (see http://go.nature.com.libproxy.utdallas.edu/yujz84) and **climatologist** Kerry **Emanuel** observed that the subject had **“**become **notorious** for its **lack of scientific integrity”** (Nature 319, 259; 1986). Robock's single-digit fall in temperature is at odds with the subzero (about −25 °C) continental cooling originally projected for a wide spectrum of nuclear wars. Whereas Sagan predicted darkness at noon from a US–Soviet nuclear conflict, Robock projects global sunlight that is several orders of magnitude brighter for a Pakistan–India conflict — literally the difference between night and day. Since 1983, **the** projected **worst-case** cooling has fallen from a Siberian deep freeze spanning 11,000 degree-days Celsius (a measure of the severity of winters) to **numbers** so unseasonably small as to **call** the very term **'nuclear winter' into question**.

## 2AC

### Meltdowns

#### Nuclear power is safe -- no meltdowns and no impact.

Svoboda, ‘10

[Elizabeth, Popular Mechanics, “Debunking the Top 10 Energy Myths”, 7-7, http://www.popularmechanics.com/science/energy/debunking-myths-about-nuclear-fuel-coal-wind-solar]

Myth No. 1 Nuclear Power Isn't a Safe Solution In a recent national poll, 72 percent of respondents expressed concern about potential accidents at nuclear power plants. Some opinion-makers have encouraged this trepidation: Steven Cohen, executive director of Columbia University's Earth Institute, has called nuclear power "dangerous, complicated and politically controversial." During the first six decades of the nuclear age, however, fewer than 100 people have died as a result of nuclear power plant accidents. And comparing modern nuclear plants to Chernobyl—the Ukrainian reactor that directly caused 56 deaths after a 1986 meltdown—is like comparing World War I fighter planes to the F/A-18. Newer nuclear plants, including the fast reactor now being developed at Idaho National Laboratory (INL), contain multiple auto-shutoff mechanisms that reduce the odds of a meltdown exponentially—even in a worst-case scenario, like an industrial accident or a terrorist attack. And some also have the ability to burn spent fuel rods, a convenient way to reuse nuclear waste instead of burying it for thousands of years. Power sources such as coal and petroleum might seem safer than nuclear, but statistically they're a lot deadlier. Coal mining kills several hundred people annually—mainly from heart damage and black lung disease, but also through devastating accidents like the April mine explosion in West Virginia. The sublethal effects of coal-power generation are also greater. "The amount of radiation put out by a coal plant far exceeds that of a nuclear power plant, even if you use scrubbers," says Gerald E. Marsh, a retired nuclear physicist who worked at Argonne National Laboratory. Particulate pollution from coal plants causes nearly 24,000 people a year to die prematurely from diseases such as lung cancer. Petroleum production also has safety and environmental risks, as demonstrated by the recent oil spill in the Gulf of Mexico. INL nuclear lab's deputy associate director, Kathryn McCarthy, thinks the industry can overcome its stigma. "It's been a long time since Chernobyl and Three Mile Island," McCarthy says, "and people are willing to reconsider the benefits of nuclear energy." Nuclear plants emit only a tiny fraction of the carbon dioxide that coal plants do, and a few hundred nuclear facilities could potentially supply nearly all the energy the United States needs, reducing our dependence on fossil fuels.

### Waste

#### Reprocessing solves

#### Waste isn’t a serious problem -- it can be easily dealt with.

Heaberlin, ‘4

[Scott W., Head of the Nuclear Safety and Technology Applications Product Line at the Pacific Northwest National Laboratory, “A Case for Nuclear-Generated Electricity”]

The other thing about these very long-lived isotopes is there isn't very much of them to start with. We will get into total waste volumes in a minute, but it is worthwhile here to capture some sense of just how small the long-lived fraction really is. While it will vary a bit with the particular reactor and how you run it, for each metric ton of spent fuel you will get about 890 grams of technetium-99 and 190 grams of iodine-129. As we will see in a bit, if all the reactors in the United States get their licenses extended and run a full 60 years, we will get about 105,000 metric tons of spent fuel. That means 20% of all the electric power for the entire United States for 60 years would give you 93 metric tons of technetium-99 and 20 metric tons of iodine-129. Isn't that a lot? ¶ The density of technetium metal is 11.5 grams per cubic centimeter, and solid iodine has a density of 4.9 gram per cubic centimeter. That means the 93 tons of technetium would fit in a cube just under 2 meters, about 6.5 feet on a side. The iodine-129 would be a bit smaller at 1.6 meters or 5.2 feet on a side. That is it. I have seen walk-in closets that would be big enough for both. And remember, this is from all the waste from all the reactors in the United States assuming they all run for 60 full years. ¶ But how radioactive would this pile of iodine-129 and technetium-99 be? ¶ The radiation would be so intense that the thermal heat coming off the combined accumulation would be about 800 watts. That is half a hair dyer. This is the "fission products radioactive for tens of thousands of years" problem, half a hair dryer of energy and a walk-in closet worth of space.

### Mining

#### Minimal environmental impact -- new techniques solve.

Bosselman, ‘7

[Fred, Professor of Law Emeritus, Chicago-Kent College of Law, “THE NEW POWER GENERATION: ENVIRONMENTAL LAW AND ELECTRICITY INNOVATION: COLLOQUIUM ARTICLE: THE ECOLOGICAL ADVANTAGES OF NUCLEAR POWER,” 15 N.Y.U. Envtl. L.J. 1, Lexis]

1. The Amount of Uranium Used Is a Tiny Fraction of the Coal Used The mining of uranium admittedly can create some of the same adverse ecological impacts as the mining of coal. [196](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n196) The difference, however, is that while the coal-fired power plants in the United States used slightly over a billion tons of coal in 2005, [197](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n197) nuclear power plants used only 66 million pounds of uranium oxide. [198](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n198) Thus the scale of the impact from uranium mining is not in the same ball park as the impact of coal mining. [199](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n199) Virtually all uranium mines currently operating in the United States are underground mines or use the in situ leaching method, [200](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n200) which both have much less impact on the environment than open pit uranium mining. [201](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n201) Moreover, coal-fired power plants produce [\*39] half the electricity in the United States while nuclear power plants produce one-fifth. [202](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n202) In addition, unlike coal, uranium used in power plants can be recycled and used again. [203](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n203) At the present time, the United States does not reprocess its nuclear fuel, [204](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n204) but countries such as Great Britain, France, Japan, and Russia do so on a regular basis. [205](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n205) The policy issues related to reprocessing are beyond the scope of this article, but it should be noted that the possibility of future reprocessing further reduces the slim risk that supplies of uranium will run out, [206](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n206) despite the fact that the known uranium resources would provide enough fuel to support four times the current amount of worldwide nuclear electricity generation for the next 80 years. [207](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n207) Furthermore, uranium is not the only element that can be used as nuclear fuel; India is producing nuclear fuel from thorium, of which it has ample supplies. [208](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd#n208)

### Oceans

#### Nuclear plants doesn’t contaminate water or hurt aquatic ecosystems.

**NEI, ‘3**

(“Powering the Future with Environmentally Sound Nuclear Energy: The Ecological Stewardship of the Nuclear Energy Industry,” 2003, http://www.nei.org/filefolder/environment-ecology\_book\_2003.pdf)

Like all electric power plants, nuclear power plants must use water for cooling. That is why so many of them are located on bodies of water. The water that is used to make the steam, and that comes into contact with radioactive material, is kept in strictly enclosed, recirculating systems. It never mingles with the cooling water, and is never discharged. The cooling water, slightly warmed but carrying no measurable radioactivity, is discharged after use. ¶ Cooling water discharged from a plant contains no harmful pollutants, but it still must meet federal Clean Water Act requirements and state standards designed to protect water quality and aquatic life. If the water is warm enough to cause possible harm to aquatic life, it is cooled before it is returned to the river, lake or bay. It is either mixed with water in a cooling pond or pumped through a cooling tower before it is discharged. In addition, power plants operate under National Pollutant Discharge Elimination System permits, which specify standards and monitoring requirements for the plants. These permits must be renewed every five years. ¶ The NRC also reviews plant operations to be sure there are no adverse impacts to water quality and aquatic ecology. In fact, nuclear plants are excellent habitats for marine and plant life, including a number of endangered and protected species. Also the safety of the discharge canal from boat traffic has provided refuge to such endangered species as manatees and crocodiles in Florida. For example, seven years before Calvert Cliffs nuclear power plant began operating on the banks of the Chesapeake Bay, scientists began studying the local marine life—blue crabs, oysters, fish and others. With more than 30 years’worth of data, scientists have determined that the Calvert Cliffs plant has no adverse effect on the local marine life, and has benefited some species.

### Ozone

#### No ozone impact, and nuclear power is comparatively better for the ozone than any other energy source.

**Bruggers, ‘1**

[James, journalist for Courier-Journal, 5-29, “Uranium Plants Harm Ozone Layer,” http://www.mindfully.org/Nucs/Uranium-Harms-Ozone-Layer.htm]

Company officials said the CFC-114 emissions will be cut in half this year, because the consolidation of the two plants means roughly half as many miles of leaky pipes. Further reductions will come in the future as the company plugs leaks with a new kind of sealant and finds a replacement coolant.¶ Nuclear power, they said, remains a clean source when compared to coal-fired power plants with their emissions of smog-causing chemicals and greenhouse gases linked to global warming.¶ ''Yes, you do have this issue with (CFC-114 and) enrichment,'' said Elizabeth Stuckle, spokeswoman for the company. ''But we are also looking to replace this technology with a new technology toward the end of this decade. Unfortunately this is a necessary thing, because these are the only enrichment facilities that this country had. We don't want to become dependant on foreign enrichment.''

### Terrorism

#### No war

#### No scenario for attacks.

Bosselman, ‘7

[Fred, Professor of Law Emeritus, Chicago-Kent College of Law, “THE NEW POWER GENERATION: ENVIRONMENTAL LAW AND ELECTRICITY INNOVATION: COLLOQUIUM ARTICLE: THE ECOLOGICAL ADVANTAGES OF NUCLEAR POWER,” 15 N.Y.U. Envtl. L.J. 1, Lexis]

Terrorists could not acquire bomb-making material from spent fuel in a nuclear power plant, because the material would be too radioactive for them to handle. [233](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n233" \t "_self) Nor would it be feasible to bomb an American reactor in a way that would release deadly radiation. [234](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n234" \t "_self) All reactors in American power plants are contained in structures made of heavy steel and concrete three to four feet thick, [235](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n235" \t "_self) and the reactor pressure vessel itself is further protected by steel walls eight inches thick. [236](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n236" \t "_self) The robust construction of nuclear power plants would provide substantially more protection against assault with airplanes or other types of weapons than exists at "other critical infrastructure such as chemical plants, refineries, and fossil-fuel-fired electrical generating stations." [237](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n237" \t "_self) Attacking a plant by crashing an airplane into it would be difficult because the reactor is a small, low structure often surrounded by large but harmless cooling towers. [238](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n238" \t "_self) Even an attempt to hit a reactor with a large airliner would be unlikely to succeed in releasing radiation, with success depending on the attacker's "unpredictable "good fortune.'" [239](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n239" \t "_self) Legitimate concerns have been raised that some (but not all) existing nuclear power plants have spent fuel storage pools in locations that might be susceptible to a terrorist attack that could drain the water from the pool, which might cause a release of radiation if the water was not quickly replaced. [240](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n240" \t "_self) The Nuclear Regulatory Commission has issued new regulations to protect against this possibility, [241](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n241" \t "_self) and designers of newly-constructed  [\*45]  power plants are now aware of this potential problem and will avoid it. [242](http://www.lexis.com/research/retrieve?_m=4a9f74e9d68358dde5b1da7c76fcc08d&docnum=49&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAB&_md5=b940f69f179ebb657dc94d1baf8c0fbd" \l "n242" \t "_self)>

### T

#### We meet – prohibits preempting proliferation

#### C/I - “restrictions” can specifically prohibit without effecting all discretion

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The restrictions on transfers to other countries may present a closer question. The restrictions place significant burdens on the President's ability to negotiate with other countries. The President must demand that the receiving country share intelligence with the United States and, when necessary, take steps to strengthen its detention system. n164 Although the conditions do not explicitly regulate the President's negotiation power, they have that effect: intelligence-sharing and security guarantees must be part of any transfer agreement negotiated by the President. The restrictions also prohibit sending detainees to countries that have had past problems with recidivism, although they give the President some discretion by allowing for a national security exception to this restriction. n165 An examination of presidential and congressional authority over foreign affairs - and negotiations in particular - suggests that the two branches may share concurrent authority over this issue.

#### Prefer our interp –

#### Key to aff creativity – their interp overlimits to 4 affs – makes the resolution stale and kills education

#### Not bidirectionality – we said that he has the authority now

#### No brightline – plan text restricts war powers authority – all of their links still apply

#### Good is good enough – competing interps creates a race to the bottom to find arbitrary interps to limit out the aff – reasonability ensures substantive education

### CP

#### Perm do both – solves the links to the net benefit – the plan only requires he get congressional support – the president can still declare he will deter chem weapons

#### Perm do the CP – Example of the Way the plan could be implemented

#### Loopholes mean cp doesn’t solve

Nowrot and Schabacker, 1998 (Karsten, LL.M. from Indiana University School of Law-Bloomington; Emily, J.D. from Indiana University School of Law-Bloomington; “The use of Force to Restore Democracy: International Legal Implications of the ECOWAS Intervention in Sierra Leone”, American University International Law Review, 14 Am. U. Int’l L. Rev. 321, Lexis)

 [\*339] A legal construction excluding the use of force for "benign ends" n108 from the scope of Article 2(4), however, raises serious issues concerning the interpretation of the prohibition of force, which is considered "the cornerstone of peace in the Charter." n109 These concerns are not based on the character of inventions seeking to restore democratically elected government, but on the fear that any exception to the prohibition will create the possibility of a "legion of loopholes" n110 in the norm and leave it vulnerable to abuse. n111 Making exceptions for "higher values," Oscar Schachter points out, may lead to a dilution of the norm to a point where "it could have no application except in the unlikely case of an announced aggression." § Marked 09:39 § n112 Such a narrow reading [\*340] of Article 2(4), excluding military measures undertaken by states for a variety of purposes from the scope of this provision, cannot control when the accepted rules of interpretation of international treaties, n113 which apply to the United Nations Charter, are employed. n114 The wording of Article 2(4) is ambiguous. n115 The language concerning territorial integrity and political independence may be understood as restricting the scope of the prohibition on the use of force. n116 Alternatively, territorial integrity and political independence may simply explicate particularly egregious violations of the prohibition, in order to strengthen the guarantee against foreign military intervention. n117 In that case, the last clause functions as "a residual "catch-all' provision." n118 Given this ambiguity in Article 2(4), alternative methods of interpretation, such as a systematic interpretation of the treaty, its purpose, and the travaux preparatoires, should be considered. n119

#### No bioweapons impact

- best experts agree, evolution and adaptation check – 4.5 billion years of evolution, yo

Krauss 12 – Prof of Physics @ ASU, PhD in Physics from MIT, Co-President of the board of sponros of the Bulletin of the Atomic Scientists, Member of the board of director of the federation of American Scientists (Lawrence, "Countdown to the Man-Made Apocalypse," Slate.com, March 16, 2012, http://www.slate.com/articles/health\_and\_science/future\_tense/2012/03/the\_doomsday\_clock\_from\_the\_bulletin\_of\_atomic\_scientists\_tackles\_biotechnology\_.html download date: 3-19-2012, CMR)

Since then, we have run three “Doomsday Symposia,” during which key scientists and policymakers assess ongoing global threats to humanity in three areas: nuclear proliferation and nuclear weapons, climate change, and biotechnology and bioterrorism. The last issue has raised a lot of heat in the media in recent years, and the specter of new lethal viruses that might wipe out populations suggested to us that there might be compelling new reasons to move the clock forward again. Indeed, as biotechnology has undergone in the past 35 years the same explosive growth that physics technology underwent in the previous period**, the emerging possibility of biologically induced weapons has increased**. **We now have the ability to artificially recreate genetic sequences, including viruses. DNA “hacking” has become a pastime at institutions such as MIT,** among the same kind of people who used to be so enamored with computer hacking. Finally, **the holy grail of genetic manipulation now involves the frontiers of synthetic biology**, wherein researchers are attempting not merely to build up genetic sequences base-pair by base-pair, but also to explore the possibility of building novel life forms from scratch. These developments are thrilling for scientists and technologists who love to take things apart and put them back together. But there remains the terrifying prospect that smart pranksters, DIYers, a laboratory, or more sinister groups could, either by accident or intentionally, accidentally create a new supervirus with the potential to wipe out all other life on Earth. (Hence the furious debate that has surrounded experiments into artificially developing forms of the avian flu virus H5N1 that is transmittable between mammals.) Indeed, just this week, a host of external watchdog organizations have called this week for a moratorium on synthetic biology. We should encourage the vigilance and rigorous discussion that has accompanied these developments. Happily, however, **the bulletin’s experts, including** Harvard biologistMatthew Meselson **and** human genome pioneer and synthetic biologist Craig Venter**, suggest the above scenarios are in the near term** unlikely at best**,** pure fiction **at worst.** In the first place, **the synthetic-biology industry is well-aware of the dangers of unmonitored genetic hacking and is responding on its own**. Appeased by the group’s self-policing thus far, the Presidential Commission for the Study of Bioethical Issues determined in 2010 that “there is no reason to endorse additional federal regulations or a moratorium on work in this field at this time.” In the second place, **while manufacturing dangerous biological compounds may be possible, weaponizing them is not so easy**. While it might be possible to inflict significant terror locally, **dispersing biological agents over broad regions to create global crises is** far more challenging. Next, there is the difficulty of reproducing appropriate technology. The field is as much an art as a science, and it is difficult to reliably reproduce results in a field where the financial benefits are likely to be so great that proprietary technology is not readily shared. **We can all** (at least those of us who, unlike some of the dominant presidential candidates, accept the reality of both evolution and an old earth) **take solace in the robustness of life itself, evolved over** 4.5 billion years **in the presence of remarkably ingenious viruses,** **which have** also **competed for survival. It is unlikely that a new organism,** without the benefit of all of this “learned experience,” **could outmaneuver all the mechanisms that life has developed to outwit constant biological invaders.** All of this suggested to those of us who have the unenviable task of regularly revisiting the possibility of Doomsday in order to help humanity adjust its thinking appropriately, that **the current revolution in biotechnology is,** for the moment, **more likely to benefit humankind than destroy it.**

### K

#### Perm do the plan and Collapse civilization – no reason the plan necessarily props up civilization

#### Civ is Sustainable –

#### Adaption – also proves no impact

**Flood, 2004** (Andrew, anarchist thinker, “Civilisation, Primitivism and anarchism,” June 11, http://struggle.ws/pdfs/andrew/primitivism.pdf)

The most convincing form the ‘end of civilisation’ panic takes is the idea of a looming resource crisis that will make life as we know it impossible. And the best resource to focus on for those who wish to make this argument is oil. Everything we produce, including food, is dependant on massive energy inputs and 40% of the worlds energy use is generated from oil. The primitivist version of this argument goes something like this, ‘everyone knows that in X number of year the oil will run out, this will mean civilization will grind to a halt, and this will mean lots of people will die. So we might as well embrace the inevitable’. The oil running out argument is the primitivist equivalent of the orthodox Marxist ‘final economic crisis that results in the overthrow of capitalism’. And, just like the orthodox Marxists, primitivists always argue this final crisis is always just around the corner. When looked at in any detail this argument evaporates and it becomes clear that neither capitalism nor civilization face a final crisis because of the oil running out. This is not because oil supplies are inexhaustible, indeed we may be reaching the peak of oil production today in 1994. But far from being the end of capitalism or civilization this is an opportunity for profit and restructuring. Capitalism, however reluctantly, is gearing up to make profits out of developing alternative energy sources on the one hand and on the other of accessing plentiful but more destructive to extract fossil fuel supplies. The second path of course makes global warming and other forms of pollution a lot worse but that’s not likely to stop the global capitalist class. It is not just primitivists who have become mesmerized by the oil crisis so I intend to deal with this in a separate essay. But in summary, while oil will become more expensive over the decades the process to develop substitutes for it is already underway. Denmark for instance intends to produce 50% of its energy needs from wind farms by 2030 and Danish companies are already making vast amounts of money because they are the leading producers of wind turbines. The switch over from oil is likely to provide an opportunity to make profits for capitalism rather then representing some form of final crisis.

#### Rebuild

**Flood, 2004** (Andrew, anarchist thinker, “Civilisation, Primitivism and anarchism,” June 11, http://struggle.ws/pdfs/andrew/primitivism.pdf)

The other point to be made here is that destruction can serve to regenerate capitalism. Like it or not large scale destruction allows some capitalist to make a lot of money. Think of the Iraq war. The destruction of the Iraqi infrastructure may be a disaster for the people of Iraq buts it’s a profit making bonanza for Halliburton and co[18]. Not coincidentally the Iraq war, is helping the US A, where the largest corporations are based, gain control of the parts of the planet where much future and current oil production takes place. We can extend our intellectual exercise still further. Let us pretend that some anarchists are magically transported from the Earth to some Earth like planet elsewhere. And we are dumped there without any technology at all. The few primitivists amongst us might head off to run with the deer but a fair percentage would sit down and set about trying to create an anarchist civilisation. Many of the skills we could bring might not be that useful (programming without computers is of little use) but between us we’d have a good basic knowledge of agriculture, engineering, hydraulics and physics. Next time the primitivists wandered through the area we settled they’d find a landscape of farms and dams. We’d at least have wheeled carts and possibly draft animals if any of the large game were suitable for domestication. We’d send out parties looking for obvious sources of coal and iron and if we found these we’d mine and transport them. If not we’d be felling a lot of lumber to turn into charcoal to extract whatever iron or copper we could from what could be found. The furnace and the smelter would also be found on that landscape. We have some medical knowledge, most importantly an understanding of germs and medical hygiene so we’d have both basic water purification and sewage removal systems. We’d understand the importance of knowledge so we’d have an education system for our children and at least the beginnings of a long-term store of knowledge (books). We could probably find the ingredients for gunpowder, which are quite common, which would give us the blasting technology need for large-scale mining and construction. If there was any marble nearby we could make concrete, which is a much better building material then wood or mud. Technology did not come from the gods. It was not imposed on man by a mysterious outside force. Rather it is something we developed and continue to develop. Even if you could turn the clock back it would just start ticking again. John Zerzan seems to be the only primitivists capable of acknowledging this and he retreats to the position of seeing language and abstract thought as the problem. He is both right and ludicrous at the same time. His vision of utopia requires not only the death of the mass of the worlds population but would require the genetically engineered lobotomy of those who survive and their off spring! Not of course something he advocates but a logical end point of his argument.

#### All countries won’t collapse at the same time – differing rates of development ensure an a-polar world which results in nuclear war and extinction

#### Turn - Space

#### Cap key to space nuclear power

**Grossman** , Professor of Journalism at the State University of New York , **2001** ( Karl , “Disgrace Into Space” , the ecologist , http://www.envirovideo.com/karldisgrace.html)

As hard-driven as the push to make space a new arena of war is the effort to make money from the heavens. Organisations including ProSpace, Archimedes Institute and Space Frontier busily lobby for unfettered capitalism in space. Allan Wasser, a ProSpace board member, has been especially active in urging that ‘the way to finesse the [Outer Space] Treaty is for the United States to pass a law directing American courts to grant recognition to an extra-terrestrial land claim made by any private entity that has established a true space settlement.’ Wasser says: ‘The 1967 OST is not the norm in human history. The right to claim newly settled property has always provided the economic incentive for human expansion. Would Europeans have settled America if they couldn’t claim ownership of the land they settled?’ On the other hand, Ryder W Miller of the Astronomical Society of the Pacific’s Mercury Magazine has coined a new term – astroenvironmentalism. With the new millenium, notes Miller, ‘private companies and national interests are making plans to tromp around the inner Solar System... The Mars Society would like to have a human presence on Mars and even terraform the planet to suit human purposes. SpaceDev would go to the asteroid Nereus for big bucks… NASA, meanwhile, is facilitating the privatisation of space ventures. All of these ventures have one thing in common: They have not incorporated the concerns or lessons of environmentalism or preservation into their plans to step outward into the Solar System.’ Miller argued that ‘the first goal of environmentalists should be to lobby the United Nations’ and national space agencies ‘to agree to ethical guidelines’. He would like ‘Outer Space Environmental Impact Statements for the world to read’. The UN Office for Outer Space Affairs (OOSA) based in Vienna has jurisdiction over the OST and the Moon Agreement. OOSA Associate Legal Officer Philip McDougall notes that the Moon Agreement ‘does not exclude potential commercial activities such as space transportation, space tourism, space based telecommunications, power generation, medical and agricultural product development etc, at all. These could conceivably all be conducted without the need to lay claim to ownership of the moon or other celestial bodies,’ he says. There are charges that, like governmental regulators of terrestrial activities, OOSA is cosy with commercial interests. Regina Hagen of the Darmstadter Friedensforum in Germany, a board member of the Global Network Against Weapons & Nuclear Power of Space, notes that when the OOSA-organised UNISPACE III conference in Vienna in 1998 was opened for industry participation there was even a ‘Preparatory Seminar’ titled: ‘The Age of Space Commercialisation. The Evolving Role of Governments and Industries in Enhancing International Cooperating in Space Activities.’ Once commercialisation enters the fray, then legal issues follow quickly behind, not least the matter of liability. For instance, a major provision of the OST is that a nation that launches ‘an object into outer space… is internationally liable for damage’ caused by it. The subsequent ‘Convention on International Liability for Damage Caused by Space Objects’ which entered into force in 1972 and like--the OST is signed by most of the world’s nations, says ‘a launching state shall be absolutely liable’ for such damage. Yet in 1991, NASA and the US Department of Energy entered into a Space Nuclear Power Agreement covering US space missions involving nuclear devices stated that henceforth the flights would be covered under a US law called the Price-Anderson Act originally passed to shelter the nuclear power industry. The Price-Anderson Act limits liability in the event of a nuclear accident to $8.9 billion for US domestic damage and but $100 million for damage to all foreign nations. Thus, if an accident occurs on the upcoming Europa plutonium-fueled NASA shot or any of other planned NASA space nuclear missions and there is an accident, despite the international treaty, the US will not accept full liability.

#### Key to space

**March**, Senior Engineering Specialist at Barrios Technology supporting NASA’s Johnson Space Center, **2k3** (Paul, Jan 30th, Gender Modified, “Can Earth's Ecology and Space Nuclear Energy Coexist? The answer is YES!”, Space Daily, http://www2.spacedaily.com:7778/news/reports/Can\_Earths\_Ecology\_and\_Space\_Nuclear\_Energy\_Coexist\_The\_answer\_is\_YE!.html)

So, what can we do now if we want to explore the solar system first hand? Without nuclear powered spacecraft, manned missions are marooned in low Earth orbit. It has become apparent with the Russian Mir Space Station program that living periods in space that are longer than four-to-six months are detrimental to the stationed personnel due to zero-g de-conditioning compounded by the physical isolation from family and friends. The data from the human factors studies obtained from the newer International Space Station (ISS) have verified these early human factor results from the Russian MIR. Add to that the knowledge from recent robotic Mars missions that the space radiation exposures that an astronaut crew would suffer on a chemically powered, six-month long trip to Mars, using standard shielding practices for manned flight vehicles, would be very detrimental to the crew's health and that's during quiet solar-flare times. If a solar flare comes along, the astronauts would be cooked in very short order unless they are supplied with a very massive radiation "Storm Cellar" or an Earth like magnetic shield to hide in during the solar flare induced radiation storms. Both of these solutions will increase the mass and/or the power requirements for the mission, which in turn increases the mission's total energy requirement. Where is this extra energy for faster transits times, as well as the extra shielding mass or extra shielding power going to come from? Chemical reaction based propulsion and power sources are already taxed to their limits with the current barebones, low mass, six-month Mars missions. The only other solution currently available to this problem is to use higher energy density propulsion and power generation fuels. Nuclear fuels can supply over ten million times more energy per unit mass than chemical reactants can. NASA's Sean O'Keefe has the right of it then. Until we can get past the "Age of Sail" in the space exploration program as exemplified by our current fleet of chemical rockets, and migrate to the "Age of Steam", i.e., rocket energy and perhaps propellant supplied by nuclear fission or fusion power, humanity will not leave Earth in any great numbers. In addition, for those who sing the solar power mantra, the numbers are not good. If you are going out to Mars and points outward bound where it is VERY COLD, some form of nuclear power is the only feasible solution. If nuclear power is the danger that the anti-nuclear people say it is, why have there been a disproportionate number of deaths and injuries due

to non-nuclear effects since the end of World War II? For comparison's sake, the worst single chemical spill accident in the world occurred at the Union Carbide/India's insecticide plant in Bhopal, India where over 6,400 people were killed and ~35,000 people were injured from a methyl isocynate gas release in December 1984. Has Mr. Gagnon and/or Dr. Kaku been trying to shut down those chemical industries that supply our farm and automobile industries? I do not remember them complaining about the oil, gas and plastics needed to grow their food or build their automobiles. We also have the little issue of the yearly volcanic eruptions that spew out more toxic chemicals into the atmosphere than humanity's entire industries put together. For context, consider the 1991 article by Dr. Michio Kaku, entitled "NASA shuffles shuttle's death card", where he explained NASA's insensitivity to the environment by noting that "the US space effort is a deformed scientific program that was born out of the Cold War and twisted by the demands of anti-Communism", with the Pentagon still secretly "in the driver's seat". In the Guardian article one of his major claims was that "Solid-fueled rockets emit large quantities of harmful hydrochloric acid, which can rapidly deplete the fragile ozone layer." Yet over a decade later, there has been no convincing study that the Space Shuttles has ever contributed more than a fraction of one percent of the annual hydrochloric acid impact on the ozone layer. Continued statements of this nature are not reflective of a balanced view. There is also displayed a single-minded view of nuclear power at work as well. The US Navy has an enviable safety record of operating nuclear power plants over several generations. With proper engineering, training and investment, this can be accomplished with the space program as well. Invocation of Chernobyl as a reason for ceasing the research, engineering and use of nuclear power and citing Plutonium as the most dangerous element to humankind is fear mongering at its most base. There are other schools of thought even on the question of the hazards of exposure to low-level radiation such as Radiation-Hormesis that deserve consideration. If we are in a multinational effort to go to Mars with nuclear power, I think it unlikely that the nuclear power in space effort is a cover for maturing the technology for use within the Dept. of Defense. Surely the other nations on-board such a program will be able to learn the same engineering and technology lessons for their own needs. This "everyone else knows how to do the same thing" approach to nuclear space power is not the sort of competitive advantage our military wants. I think that ground based nuclear power reactors can be built and operated safely with the appropriate safety design, proliferation safeguards and a middle of the road concern for the environment. This goes as well for flying uranium-235 enriched nuclear reactors for use in space with little risk to the public. I believe that NASA understands that the risks of flying open-cycle NERVA like nuclear thermal rockets in the Earth's atmosphere while low, are still non-zero and that it wouldn't be prudent to fly such a rocket from the Kennedy Space Center (KSC). Flying NERVA type rockets or hybrid nuclear RAM-jets from the middle of the Pacific Ocean, off a Lockheed/Russian Zenit like mobile oil barge on the other hand, might make sense and would definitely lower the cost to get into orbit. What NASA is now proposing though with their Prometheus Project is to fly CLOSED-Cycle enriched U-235 fueled nuclear-electric reactor/rockets, cold, i.e., it has never been activated and thus virtually non-radioactive, from KSC. If the rocket carrying such a closed-cycle reactor system should crash, the cleanup would be no worse than any other industrial chemical spill and a small one at that. Until we have one or more reliable aneutronic fusion sources that use hydrogen/deuterium with He-3, Boron-7 or some other aneutronic fuel combination, or an even more exotic vacuum based energy source, nuclear fission is the only way to produce the energies needed to pursue manned spaceflight and solar system exploration in any serious manner. Just look at the leap in capability that submarines had when they went from chemical fuels to using nuclear energy for their propulsion. It was a quantum leap in naval capability and even the two US nuclear boats and all the Russian nuclear boats as well that were lost to accidents at sea over the last 40 years did not ruin the environment. And a question for Mr. Gagnon in your statement, "During the Cassini RTG fabrication process at Los Alamos, 244 cases of worker contamination were reported to the DoE. " What is the reference for this and how badly contaminated were these workers? NASA has to adopt an environmentally sound but non-timid approach to nuclear powered space flight or we are stuck on earth for the foreseeable future. Perhaps that is what Mr. Gagnon's & Dr. Kaku's group is really after, that is having what's left of the human race, after we've reduce our numbers to "sustainable levels", go back to being "Noble Savages", waiting for extinction from a Yellow Stone like super volcano eruption or the impact of another dinosaur killer asteroid or comet.

#### Extinction

**Gangale, 7** (Thomas, aerospace engineer and a former Air Force officer. He is currently the executive director at OPS-Alaska where he manages projects in political science and international relations., “A Progressive Vision of Human Space Exploration--Important to California, a Leader in Aerospace and High Tech” http://www.californiaprogressreport.com/2007/12/a\_progressive\_v.html)

As I have written elsewhere, there is a libertarian, no-holds-barred free enterprise vision of space development. There is also a neoconservative rationale for militarizing space. A progressive vision of space to counterbalance these has yet to be articulated to a comparable level of prominence. This is of particular importance to California as a leader in the aerospace and high tech industries. Profit is not the only reason to go into space; money is not the only measure of value. National prestige can sustain a certain level of effort for non-military programs over a period of decades; in the United States, that level has been about one percent of the federal budget. Military programs to project national power can command several percent of the federal budget. A politically-motivated display of national technological power may cause a technocratic spike in space activity. If there were no money to be made in space, if there were no national security strategies in space, it is true that many would shrug and say, "What use is it?" But it is also true that some would understand that this tiny Earth of ours is subject to forces far above its atmosphere. Earth is in outer space, therefore we live in outer space. Regardless of whether we take a moment from our mundane existence to reflect on that fact, it is nevertheless fact, a fact that the dinosaurs could not comprehend as the Cretaceous Period went out with a bang 65 million years ago. Developing a spacefaring culture is a matter of survival, not just to gain the ability to detect and deflect asteroids and comets on a collision course for Earth, but to escape the resource constraints of our limited planet. There are perhaps 30 years of petroleum left; let’s hope that by the time it runs out, commercial fusion power (perhaps fueled by the Moon’s helium-3) or solar power satellites are up and running, waiting for the baton to be passed. If not, the Great Machine on which Earth’s billions depend could shudder to a halt. **Given the global population of 800 million that a rudimentary industrial economy supported a couple of centuries ago, collapse of the Great Machine could mean death for ninety percent of Earth’s population toward the middle of the 21st century, death by starvation, opportunistic diseases, and resource wars.** I am not saying that the end of the world is nigh, nor am I saying that the only path to avoiding the Apocalypse leads into space, but I am saying that Earth-based solutions to the end of oil may not be entirely adequate. In space, there is the possibility of developing other options, and it would be wise to have them available should we need to exercise them. While the business case for space tourism pioneering cheap and large-scale spacelift capability is questionable, the case for keeping the Great Machine running is obvious.

#### Growth key to solve natural disasters – extinction

**Morris in ‘5** (Julian, Executive Dir. @ International Policy Network and Visiting Prof. @ U. Buckingham, “Confuse: How Jared Diamond fails to convince”, Energy & Environment, 16:3-4, http://policynetwork.net/uploaded/pdf/morris\_collapse\_review.pdf)

Citing the example of the Greenland Norse, Diamond cautions against excessively conservative cultures and stresses that we have to adapt our culture to changing circumstances. He then asserts that in the current era we need to become more environmentally conscious and gives numerous examples of the importance of environmental interest groups influencing policy. But aren’t the stasis-obsessed environmentalists he praises really arch conservatives? If stasis killed the Greenland Norse, as Diamond claims, won’t it likely kill us too? And what if ‘environmental concern’ leads us to ignore more important dangers, such as the threat of suicidal terrorists? Or, what if it leads us to reduce rates of economic growth and technological development, with the consequence that when a catastrophe does occur – of a human or non-human induced nature – such as a supervolcano, giant tsunami, asteroid or any number of unforeseen and unimagined threats – then society will be less able to cope with the consequences than had we allowed economic growth and technological change to proceed.

#### Turn Environment

#### Capitalism encourages efficiency and waste reduction

**Walberg and Bast, 03** (Herbert J. Walberg, distinguished visiting fellow at the Hoover Institution, and Joseph L. Bast, C.E.O. of the Heartland Institute, October 23, 2003, “Education and Capitalism: How Overcoming Our Fear of Markets and Economics Can Improve America's Schools”, page X)

WHY CAPITALISM PROTECTS THE ENVIRONMENT What has made this vast improvement in environmental quality possible in the United States? Why have countries without capitalist institutions made less progress? The security of personal possessions made possible by the capitalist institution of private-property rights is a key reason why capitalism protects the environment. Where property rights are secure, the owners of property (land as well as other physical assets) are more likely to invest in improvements that increase the property’s long-term value.Why plant trees if your right to eventually harvest them is at risk? Why manage a forest for sustained yields in the future if someone else will capture the profit of their eventual harvest? Evidence that secure property rights are the key to good stewardship of assets is all around us. Privately owned houses are better maintained than rental units. Privately owned cars and trucks are better maintained than fleet vehicles (owned by an employer) and leased vehicles. In the former Soviet Union, privately owned gardens—representing only a small share of the land devoted to agriculture—produced as much as half of the fruits and vegetables produced by the entire country. In virtually every neighborhood in the United States, most front yards are neatly groomed and often elaborately landscaped, whereas the strip of public land between the sidewalk and the street is often weedy, poorly trimmed, and neglected. Markets, the second capitalist institution, tend to increase efficiency and reduce waste by putting resources under the control of those who value them most highly. This tends to ratchet downward the amount of any resource that is not used or consumed during production, a practice that produces cleaner-burning fuels and machines, lower-emission manufacturing processes, fewer byproducts shipped to landfills, and so on. A good example of this is the fact that the amount of energy required to produce a dollar of goods and services in the United States fell 1.3 percent a year from 1985 to 2000 and is expected to fall 1.6 percent per year from 2000 to 2020.48 Finally, the wealth created by the institutions of capitalism makes it possible to invest more resources to protect the environment. Once again, the United States is the best example of this tendency. The cost of complying with environmental regulations in 2000 was approximately $267 billion, or nearly $2,000 for every household.49 Only a capitalist society can afford to spend so much.

## 1AR

### Manufacturing

#### Manufacturing capability will develop as the industry expands.

Howard, ‘7

[Angie, Vice President -- NEI, 2-15, “Achieving Excellence in Human Performance: Nuclear Energy Training and Education,” http://nei.org/newsandevents/speechesandtestimony/2007/americannuclearsociety/]

Finally, we are seeing the first signs of revival in the supply chain for new nuclear plant construction. In manufacturing, for instance, Babcock & Wilcox recently renewed its federal accreditation for manufacturing nuclear-grade components. And there is manufacturing capability overseas in Japan and France. U.S. nuclear companies have already placed orders with Japanese companies for long-lead, heavy-forgings for reactor components. The supply chain will respond as market demand dictates. The more it looks like new nuclear plants will be built, the more U.S. capability will be developed. Today, 14 companies and consortia have announced that they are preparing to submit license applications to the Nuclear Regulatory Commission to build up to 32 new reactors. These companies are selecting technologies from two NRC-certified reactor designs, and two more designs that are under review by the NRC. These application submittals are expected beginning in 2007. Every major nuclear fleet operator is involved in some way, as well as some newcomers to the industry. Different companies are moving at different speeds, but the momentum is real.

### Fukushima

#### Didn’t kill the market

Lovering et al. 9/10/12 (Jessica Lovering, Ted Nordhaus, and Michael Shellenbergerare policy analyst, chairman, and president of the Breakthrough Institute, a public policy think tank and research organization, “Out of the Nuclear Closet”, http://www.foreignpolicy.com/articles/2012/09/07/out\_of\_the\_nuclear\_closet?page=full, CMR)

A year and half after the accident, it's clear that the political fallout from Fukushima has been less than many anticipated. Despite the predictable denunciations from anti-nuclear campaigners and high-profile shifts away from nuclear both in Germany-- which is now planning to phaseout nuclear power entirely by 2022 -- and Japan -- where the government is seriously considering making the country's post-Fukushima shutdown permanent -- the nuclear landscape today looks much as it did before the accident. In places where rapidly growing energy demand has outstripped the availability of domestic fossil fuel reserves, nuclear remains the only reliable alternative to generate sufficient electrical power. China and India are proceeding apace with plans to expand their nuclear generation capacity dramatically. South Korea recently announced plans to increase significantly the percentage of electricity it gets from nuclear energy.

### Uranium

#### Uranium is abundant, and comparatively more common than any fossil fuel sources.

CSAC, ‘00

[Community Science Action Guides, “The Benefits of Nuclear Energy,” http://www.fi.edu/guide/wester/benefits.html]

Abundant fuel with low cost and stable price. US nuclear power plants use an enriched form of uranium for fuel. Uranium is a relatively abundant element that occurs naturally in the earth's crust. Uranium oxide is about as common as tin. In 1998, 16 countries produced over 99 percent of the world's total uranium production. Canada's and Australia's uranium mines account for 46 percent. Compared to natural gas, a fuel also used to generate electricity, uranium is already relatively low in cost and less sensitive to fuel price increases. And a little goes a long way: one uranium fuel pellet-the size of the tip of your little finger-is the equivalent of 17,000 cubic feet of natural gas, 1,780 pounds of coal, or 149 gallons of oil.

### Rare Earth

#### No Rare Earth Crisis

Scissors 11 **(**Derek Scissors, adjunct professor at George Washington University, “Rare Earth Market Fine Without Government Interference, 11/2/11) <http://www.heritage.org/research/reports/2011/11/rare-earth-market-fine-without-government-interference>

It may have seemed as if the prices of rare earth elements could only rise, but they have recently dropped quite a bit. The drop—and what is behind it—is an excellent reminder of why government should not use price fluctuations as an excuse to interfere in markets. In rare earths, the government’s current role should be to provide information that private actors cannot gather on the location of reserves, foreign trade behavior, and potential defense needs. **More Rare Earths** Rare earth elements (REEs) are a group of 17 elements (actually relatively abundant, despite their name) that have valuable uses in energy and military equipment. REEs gained global attention when prices began to rise in 2009, a trend that continued into 2011. During this two-year period, a debate began between those calling for the U.S. government to try to curb the prices’ rise by ensuring supply and those arguing that market supply and demand should be allowed to work unimpeded. Higher prices encourage the entry of new suppliers and encourage existing suppliers to expand. Both of these results have occurred in rare earths in the U.S. and elsewhere. Existing firms have mushroomed in size along with REE prices, new firms have been created, and new deposits have been discovered, as to be expected with the greater incentive to explore.[[1]](http://www.heritage.org/research/reports/2011/11/rare-earth-market-fine-without-government-interference%22%20%5Cl%20%22_edn1) The inevitable result of this supply expansion is a change in the price trend. In July, prices began a decline that has lasted four months and counting, intensified in October, and brought REE costs down about 40 percent (from the peak).[[2]](http://www.heritage.org/research/reports/2011/11/rare-earth-market-fine-without-government-interference%22%20%5Cl%20%22_edn2) This is less a function of new supply physically becoming available than it is the prospect of more new supply than expected becoming available. REE prices had skyrocketed on the anticipation of long-term shortages, but the market is now correcting, as anticipated shortages no longer seem as acute. There is a notable asterisk to the change in market conditions. In the second half of October, leading Chinese suppliers announced suspensions of production. Their unpredictable behavior may reintroduce the fear of chronic or acute shortages that drove the market higher. Indeed, this seemed to be the explicit goal of the initial announcement by Baotou.[[3]](http://www.heritage.org/research/reports/2011/11/rare-earth-market-fine-without-government-interference%22%20%5Cl%20%22_edn3) **Are REEs Different?** So REEs may very well rise again. There are, of course, those who believe the government should act whenever the price of something is deemed objectionable. Homes, health care, stocks, foreign currency—you name it. The result is the same: Most consumers get hurt. However, there are also claims that the situation is different for REEs. Most importantly, some REEs are used in military equipment. This is true, but unhelpful. Some REEs are important to the U.S. military, but most are not. Within the group that is important, some materials have long life cycles.[[4]](http://www.heritage.org/research/reports/2011/11/rare-earth-market-fine-without-government-interference%22%20%5Cl%20%22_edn4) It is dangerously misleading to discuss REEs as important to national security without discussing projections for any unmet military demand of particular elements. The other feature of REEs that is often cited to justify government action is China’s supply dominance. The PRC is said to supply more than 90 percent of REEs as a whole, though this figure may now be declining. One reason for a decline is that, even before the temporary halt in October, Beijing had been seeking to restrict the output of various Chinese producers.[[5]](http://www.heritage.org/research/reports/2011/11/rare-earth-market-fine-without-government-interference%22%20%5Cl%20%22_edn5) This naturally engendered widespread suspicion that the PRC is trying to use its near-monopoly position to prey on buyers. Chinese production dominance of REEs is unfortunate, but it is also unstable. While the viability of deposits varies with price, the PRC controls no more than 50 percent of world REE reserves, and as exploration continues, that number is likely to fallMARK.[[6]](http://www.heritage.org/research/reports/2011/11/rare-earth-market-fine-without-government-interference%22%20%5Cl%20%22_edn6) China’s extreme production dominance can only last as long as it is willing to offer REEs at below-market prices. This occurred for most of the past decade, which is why China now has the leading position. As soon as Beijing stopped undercutting market prices, prices rose and the global hunt for alternatives began—which has started to bring prices down. As long as suppliers can freely enter, the REE market will work properly, regardless of China’s role. **U.S.** **Should Get Ready** REEs are prominent in part because there are multiple dimensions for possible government action. Some of these actions should be taken; others should not. In Congress, there are many pieces of legislation concerning REEs, advocating everything from research to recycling to retread industrial policy. Active government intervention in the REE market is unjustified—a classic example of firms calling on the rest of the nation to subsidize them for the sake of a nonexistent national interest. The market is working on its own. It is certainly dynamic, though, which indicates a role for the federal government to provide information. For example, higher REE prices have encouraged exploration and are in the process of altering estimates of American and world REE reserves. This information would be very difficult for a private actor to compile and update, making it a valuable government responsibility to do so. Externally, Chinese behavior is distorting the global market and runs counter to World Trade Organization (WTO) principles—another area for legitimate government action. Potentially the most important area is defense. Changing use and availability of REEs for military applications must be tracked over time so the U.S. is not surprised by shortages. The U.S. should thus take several steps to stay prepared: Congress should not subsidize REE mining, production, or refinement in any way. Congress should consider the value of devoting resources to gathering more information on REEs, as market conditions have changed and can change rapidly. The United States Trade Representative should ask China for a clarification of recent actions and statements concerning REEs, as a first step toward a WTO case if necessary. The Department of Defense should provide regular reports, classified or unclassified, concerning demand and supply of those REEs needed by the military. A rare earths crisis has not occurred and will not occur. Because prices may go up as well as down, the U.S. government should gather information on possible market shifts.

### Ozone

#### No ozone impact

Ridley 12 [Matt Ridley, columnist for The Wall Street Journal and author of *The Rational Optimist: How Prosperity Evolves,* 8/17, “Apocalypse Not: Here’s Why You Shouldn’t Worry About End Times”, http://www.wired.com/wiredscience/2012/08/ff\_apocalypsenot/all/]

The threat to the ozone layer came next. In the 1970s scientists discovered a decline in the concentration of ozone over Antarctica during several springs, and the Armageddon megaphone was dusted off yet again. The blame was pinned on chlorofluorocarbons, used in refrigerators and aerosol cans, reacting with sunlight. The disappearance of frogs and an alleged rise of melanoma in people were both attributed to ozone depletion. So too was a supposed rash of blindness in animals: Al Gore wrote in 1992 about blind salmon and rabbits, while The New York Times reported “an increase in Twilight Zone-type reports of sheep and rabbits with cataracts” in Patagonia. But all these accounts proved incorrect. The frogs were dying of a fungal disease spread by people; the sheep had viral pinkeye; the mortality rate from melanoma actually leveled off during the growth of the ozone hole; and as for the blind salmon and rabbits, they were never heard of again.¶ There was an international agreement to cease using CFCs by 1996. But the predicted recovery of the ozone layer never happened: The hole stopped growing before the ban took effect, then failed to shrink afterward. The ozone hole still grows every Antarctic spring, to roughly the same extent each year. Nobody quite knows why. Some scientists think it is simply taking longer than expected for the chemicals to disintegrate; a few believe that the cause of the hole was misdiagnosed in the first place. Either way, the ozone hole cannot yet be claimed as a looming catastrophe, let alone one averted by political action.