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#### Counterplan: States should create and adopt a new set of flexible regulations concerning responsible space activities focused on issues of governance of lunar heritage, and scientific research & development, including but not limited to revising treaties to allow for private outer space appropriation with taxation paid to the United Nations to be used for redistributive efforts.

#### Process comes before product – the only way to create better policies is to bring the people impacted by decisions into the decision-making process – only property rights can guarantee a seat at the table

Barter 98 [PhD, Coordinator, Sustainable Transport Action Network for Asia and the Pacific A Rahman, UNCHS (Habitat) Regional Symposium on Urban Poverty in Asia, Transport and Urban Poverty in Asia: A Brief Introduction to the Key Issues, http://www.fukuoka.unhabitat.org/docs/occasional\_papers/project\_a/06/transport-barter-e.html]

The Recife Declaration includes a strong emphasis on recognising the fundamental right of the poor to take part in decisions which impact on them. It states that the voices of the poor must be heard (United Nations Centre for Human Settlements (Habitat), 1996). Some governments and experts fear that an openness to participation will hinder decisive policy making. There is a traditional mistrust in transport planning of all community involvement, let alone involvement by the poorest people. However, experiences are showing that such involvement can be constructive and make public policies more likely to be well-considered and enforceable. Meaningful participation in transport planning decisions by stakeholders, with a special effort to hear those who are usually voiceless and powerless, can lead to workable solutions to otherwise intractable conflicts. Poor communities have demonstrated that they can be reasonable when treated fairly and sincerely but are very vulnerable and their range of choices is extremely limited. When consulted in a meaningful way, with the help of experienced NGOs, groups of low-income people have demonstrated the ability to state their interests, to appreciate many of the wider issues and to seek reasonable compromises. Documented cases that illustrate these points include negotiations involving the inhabitants of settlements along Mumbai railway lines and consultations with pedicab (cycle rickshaw) drivers in Dhaka about potential changes to their operating conditions (Gallagher, 1998; Patel and Sharma, 1997). This year a number of NGOs have championed the rights of low-income pedicab drivers in Java who are seeking the right to ply their trade in Jakarta after having been banned since 1989, and have managed to open up a process of negotiation and debate with the relevant authorities. The chances of success appear to be high. These good examples are unfortunately isolated and the documents include a realistic assessment of the enormous effort that will be required to make official agencies more receptive and consultative. The norm is that many communities have seen insincere consultations that merely seek to legitimise unfair actions that harm their communities and which have left them justifiably suspicious and cynical. Hearing the voices of the poor requires proactive effort from the relevant agencies. Non-governmental organisations and networks need to develop a much larger role in this proactive effort in the transport sector as they already have in other sectors, such as in shelter issues (International Forum on Urban Poverty, 1998; Patel and Sharma, 1997). Most of the NGOs and CBOs in Asia that assist poor communities to organise and empower themselves have not yet established strong capabilities to tackle transport issues and to make the connections between transport and other urgent issues for the poor, such as shelter, employment and basic services. The organisations that champion the interests of the poor in higher level policy debates have also sometimes missed the key transport issues that affect low-income people the most. Environmental organisations have taken up transport more often but sometimes in ways that are not sensitive to the needs of the poor. Civil society organisations that specifically champion the modes of transport used by the poor are generally non-existent or weak in most Asian cities (although there are exceptions). If the voices of the poor are to be heard more strongly in transport then decision-makers will need to become more receptive AND civil society will need to develop its capacity to tackle transport issues in a well informed way (and be assisted to do so) (Hook, 1998). One of the key aims of the SUSTRAN network is to help community groups and NGOs get access to the information and assistance that they need to demystify transport issues and to tackle them in a pro-poor way. Without broad-based consultation, the main voices that tend to be heard by government on transport issues are the well-organised and wealthy lobbies for car users, the trucking industry, the motor vehicle industry, the oil industry, and the infrastructure construction industry. Categories of actors and stakeholders in urban transport are numerous and their interactions complex (Dimitriou, 1992; Rimmer, 1986; Townsend, 1995). Transport is one field where public policy clearly does have a major impact upon the outcomes even in low-income settings (Allport, 1995; Barter, 1998, in preparation; Cervero, 1995; Hook and Replogle, 1996; Newman, 1993). Political processes and public participation must occur hand-in-hand with technical planning procedures. Participation is essential in order to balance the effects of market and government failures (Hook, 1998). Hearing alternative voices can also help to overcome the "wind-screen view" of transport problems by many urban transport decision makers. Most politicians, senior planners and transport engineers have little personal experience of using non-motorised transport or public transport as adults. This is particularly acute in cities where there is a strong polarisation between rich and poor. The transport planning professions are also highly male-dominated in most countries. This is a serious obstacle to a gender-aware approach.

#### Citizen participation in decision-making spills over to greater openness and improvements in the planning process

Willson 01 [Willson, R. Assessing communicative rationality as a transportation planning paradigm. Transportation 28, 1–31 (2001). https://doi.org/10.1023/A:1005247430522]

The effects of this approach are greater attention to ends (goals), better integration of means and ends, new forms of participation and learning, and enhanced democratic capacity. Because of the educational function of planning, planning documents and presentations do more than document technical analysis – they engage the public in thinking about fundamental questions, explore images, ideals and values, and open up the process to creative participation. Public participation is seen as a part of an ongoing learning process, not an episodic event prior to the adoption of a new plan. Example: The parking planning effort has multiple purposes: 1) to design and implement parking policies; 2) to promote learning about the ridership, fiscal, environmental and social equity goals of the agency; and 3) to build a deliberative capacity among decision-makers and community stakeholders for addressing other strategic transit issues. The planning process helps decision-makers, stakeholders and the public learn about how transit agency goals are realized in specific policies and informs the broader goals of the transportation agency and society. For example, one board member may see free surface parking as the impediment to economically feasible transit-oriented development while another might see it as a basic right of a commuter. The planning process helps them explain their perspectives, search for common ground and agree to tradeoffs. Similarly, discussion about the distributional consequences of alternative parking charges may lead to discussion of broader station access strategies, or even a discourse that redefines the mission of the organization. The parking issue is a way of developing the strategic plan of the organization and can be a catalyst for broader public debate about transportation pricing, transportation equity and the environment. Planning process. As shown in Figure 2, communicative transportation planning does not involve a linear progression from ends to means. Instead, it is an iterative process that transforms the decision environment and the participants themselves. Participants simultaneously consider means and ends. Communicative transportation planning emphasizes listening, conveying, interpreting, mediating and bridge-building between stakeholders – encouraging them to ease their commitment to pre-existing positions and to share interests and goals. It is open to and influences the larger context of societal values, public opinion, institutions and stakeholders. Consequently, communicative planning itself may develop or modify the planning process. Finally, communicative transportation planning encourages a continuous critique about the planning process and its effects. It draws attention to that process rather than using a cookbook-like set of procedural steps for planning.7 Accordingly, communicative rationality involves experimental approaches because developing the planning process is an explicit part of the planning activity.

#### Private entities don’t act on debris because of uncertainty about property rights – CP creates incentives for management, tracking and cleanup

Larsen 18 [Paul B. "Solving the space debris crisis." J. Air L. & Com. 83 (2018): 475.]

**Uncertainty about ownership of** unidentifiable space **debris represents a difficulty in appropriation and removal** of space debris by states other than by the original launching state of registry.63 The problem is that some debris cannot be identified, and thus, a claimant cannot prove that it belongs to an identifiable launching party. **That may present uncertainty for a launching state about its legal right to valuable space debris**. But, **in addition**, it presents particular legal difficulty as **to the right of third party states to remove such debris**. **The uncertainty of property rights** to debris **causes third party states to hesitate to remove unregistered and unclaimed space debris.** A general international agreement to waive sovereign claims to unidentified space debris to facilitate removal of debris by third parties is recommended.64

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#### Strong commercial space catalyzes tech innovation – progress at the margins and spinoff tech change global information networks

Joshua Hampson 2017, Security Studies Fellow at the Niskanen Center, 1-25-2017, “The Future of Space Commercialization”, Niskanen Center, https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf

Innovation is generally hard to predict; some new technologies seem to come out of nowhere and others only take off when paired with a new application. It is difficult to predict the future, but it is reasonable to expect that a growing space economy would open opportunities for technological and organizational innovation. In terms of technology, the difficult environment of outer space helps incentivize progress along the margins. Because each object launched into orbit costs a significant amount of money—at the moment between $27,000 and $43,000 per pound, though that will likely drop in the future —each 19 reduction in payload size saves money or means more can be launched. At the same time, the ability to fit more capability into a smaller satellite opens outer space to actors that previously were priced out of the market. This is one of the reasons why small, affordable satellites are increasingly pursued by companies or organizations that cannot afford to launch larger traditional satellites. These small 20 satellites also provide non-traditional launchers, such as engineering students or prototypers, the opportunity to learn about satellite production and test new technologies before working on a full-sized satellite. That expansion of developers, experimenters, and testers cannot but help increase innovation opportunities. Technological developments from outer space have been applied to terrestrial life since the earliest days of space exploration. The National Aeronautics and Space Administration (NASA) maintains a website that lists technologies that have spun off from such research projects. Lightweight 21 nanotubes, useful in protecting astronauts during space exploration, are now being tested for applications in emergency response gear and electrical insulation. The need for certainty about the resiliency of materials used in space led to the development of an analytics tool useful across a range of industries. Temper foam, the material used in memory-foam pillows, was developed for NASA for seat covers. As more companies pursue their own space goals, more innovations will likely come from the commercial sector. Outer space is not just a catalyst for technological development. Satellite constellations and their unique line-of-sight vantage point can provide new perspectives to old industries. Deploying satellites into low-Earth orbit, as Facebook wants to do, can connect large, previously-unreached swathes of 22 humanity to the Internet. Remote sensing technology could change how whole industries operate, such as crop monitoring, herd management, crisis response, and land evaluation, among others. 23 While satellites cannot provide all essential information for some of these industries, they can fill in some useful gaps and work as part of a wider system of tools. Space infrastructure, in helping to change how people connect and perceive Earth, could help spark innovations on the ground as well. These innovations, changes to global networks, and new opportunities could lead to wider economic growth.

#### Short innovation cycles mean every contract counts

John J. Klein 19, Senior Fellow and Strategist at Falcon Research Inc. and adjunct professor at the George Washington University Space Policy Institute, 1-15-2019, "Rethinking Requirements and Risk in the New Space Age," Center for a New American Security, https://www.cnas.org/publications/reports/rethinking-requirements-and-risk-in-the-new-space-age

Unfortunately, these variances in models between the MDAP’s lengthy development cycle and the commercial space sector’s 18-month innovation cycle are a result of stark differences in thinking about requirements and risk. Requirements and risk for MDAPs commonly focus on ensuring critical mission capabilities at a given cost. In contrast, the commercial space sector tends to focus more on providing innovation quickly using economies of scale. The commercial sector understands that time dynamically shapes decisions related to requirements and risk because of the relatively short innovation cycle. In a highly competitive space sector with tight profit margins, those unable to innovate quickly will likely be out of business soon. Alternatively, space systems with mission assurance requirements – where failures are detrimental to national security and military operations – often drive DoD’s timelines. Program managers of critical national security space systems commonly require additional time to test and verify that satellites can perform missions with a very low probability of failure.

#### The government will rely on overly restrictive policies to enforce regulations – that kills commercial space

Joshua Hampson 2017, Security Studies Fellow at the Niskanen Center, 1-25-2017, “The Future of Space Commercialization”, Niskanen Center, https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf

Regulations, if found to be necessary, should be consistent, unambiguous, and specific. The process for rulings on decisions should be transparent and consistently applied. The government should avoid using catch-all categories and should instead specifically draft the rules for individual activities in space if needed. The government should also remember that the OST is not self-executing. Although there could be international consequences for decisions made about whether to regulate an activity in space or not, the United States has leeway in determining what needs authorization and how intensive “continuing supervision” needs to be. The United States also should not try to guess what 213 commercial uses of outer space may become viable or not. It is important to remember the lesson of AT&T’s 1960 license application: the commercial sector may surprise the government in what the latter believes to be viable.214 Because of Article VI mandate in the OST and the complexity of the issues at play, avoiding burdensome regulation is the hardest policy suggestion. The mere presence of complexity, however, does not mean that the government should err on the side of overly restrictive policies, especially when the benefits to liberalizing the regulations in this industry are so pronounced.

#### Fiat means the plan circumvents normal procedures for industry dialogue---that wrecks certainty and confidence, even if the substance of the plan is pro-business

Jeff Foust 18. Editor and publisher of The Space Review, and a senior staff writer with SpaceNews. 11-5-2018. "The Space Review: Turning space policy into space regulation." The Space Review. http://www.thespacereview.com/article/3598/1

More than five months ago, President Trump signed Space Policy Directive (SPD) 2, a policy document directing a series of regulatory reforms related to commercial space activities. That document, largely incorporating recommendations made at a February meeting of the National Space Council, was hailed by the space industry as a key step towards streamlining regulations and cutting red tape. “While many details have yet to be worked out, we are a committed and constructive partner in revising and reducing cumbersome space regulations,” said Frank Slazer, vice president for space and workforce at the Aerospace Industries Association, in a statement after the signing of SPD-2 (see “A step towards a ‘one-stop shop’ for commercial space regulations”, The Space Review, May 29, 2018). Now, though, is the time to work out those details. SPD-2 set schedules for some of those regulatory reform efforts, most notably reforms to launch licensing. The directive requires the Department of Transportation (through the FAA) to develop a formal, public draft of revised regulations for commercial launch and reentry regulations. Those changes, the directive states, would include unifying launch licenses and the use of “performance-based criteria” for licensing versus prescriptive requirements. Industry had long sought streamlining of such regulations, such as the requirement that a vehicle have a separate launch license for each site it operates from. “I think it requires heroics when you make any changes to those launch licenses. When you have to change a launch pad from [Space Launch Complex] 40 to [Launch Complex] 39A or back to 40, you have to basically apply for a new license,” said Gwynne Shotwell, president of SpaceX, at the first National Space Council meeting in October 2017. That’s a reference to the two launch sites the company has several kilometers apart in Florida, but in separate jurisdictions: LC-39A at the Kennedy Space Center and SLC-40 at Cape Canaveral Air Force station. Vice President Mike Pence picked up on that issue at the council’s second meeting in February. “You know, the government’s figured out how to honor driver’s licenses across state lines,” he said. “There’s no reason we can’t do the same for rockets.” While the government and industry might be on the same page when it comes to the broad goals of the regulatory changes, how that gets converted into actual regulations is an ongoing process. It’s one that’s taking place at rapid speed—from a bureaucratic point of view—in order to meet the deadline in SPD-2. “We’re moving at a rocket pace. We’re going as fast as we possibly can,” said Kelvin Coleman, the acting associate administrator for commercial space transportation at the FAA, during an October 31 meeting of the FAA’s Commercial Space Transportation Advisory Committee (COMSTAC) in Washington. A typical “rulemaking” process at the FAA can take four to five years to complete, he said. “It usually takes us a year or two, maybe three, even to get to a draft.” “I think, frankly, after repeated calls for that engagement, it is of concern to me, and to a number of other members, that the FAA has decided not to do that,” said Alexander. Both Coleman and his deputy, Dorothy Reimold, said at the COMSTAC meeting that they intended to stick to the schedule in SPD-2. That would require the formal publication of the draft revised regulations, known as a notice of proposed rulemaking (NPRM), in less than three months. “The target and intent—and we view it not as anything less than an obligation to follow the requirements under SPD-2—is to publish an NPRM on February 1,” said Reimold. That’s created some concerns in industry, though, that the process might actually be going too fast. For example, to support the development of the draft rule, the FAA established an Aviation Rulemaking Committee, or ARC, earlier this year to solicit industry input on how to revise existing launch and reentry regulations. That committee, though, hasn’t been given the opportunity to meet again with the FAA to follow up on its earlier input. “Frankly, as we’ve said many times to individuals and to groups, time has not been on our side,” Reimold said. “We have not been able to bring the ARC back together to have the kind of venue that I think was being sought, not for lack of wanting to but simply because time has not allowed us to do that.” Some on COMSTAC, whose members include representatives of major commercial launch providers and related companies, said they’re [they are] concerned about not knowing more about the development of the proposed rule. They said they’re worried that the FAA might release a draft rule next February with language that doesn’t match the intent of the regulatory reform. “I want to really register a strong concern with how the FAA is approaching the upcoming NPRM,” said Brett Alexander, director of business development for Blue Origin, citing what he said was a “lack of dialogue, insight, transparency and engagement” by the FAA. “I think, frankly, after repeated calls for that engagement, it is of concern to me, and to a number of other members, that the FAA has decided not to do that.” Reimold said there had been “internal discussions” about ways discuss the development of the rule and get additional industry input. “The pace that we’re at right now to pull this off is just extraordinary,” she said. “It frankly just didn't allow any kind of natural opportunities” for discussion. “It is not a lack of good intent or willingness. We’re not trying to hide anything,” she added. “We’re simply trying to get the job done.” “The balance that we have to be careful of here is that we certainly want to get these out as quickly as humanly possible, and we don’t want to do anything that would delay that process,” said Mike Gold, chairman of COMSTAC. “At the same time, we want to get industry feedback in.” Industry—and everyone else—will have a chance to comment once the NPRM is released in February. The details of how long the comment period would be, and how those comments will be incorporated into development of a final rule, haven’t been announced.

#### Tech innovation solves every existential threat – cumulative extinction events outweigh the aff

Dylan **Matthews 18**. Co-founder of Vox, citing Nick Beckstead @ Rutgers University. 10-26-2018. "How to help people millions of years from now." Vox. https://www.vox.com/future-perfect/2018/10/26/18023366/far-future-effective-altruism-existential-risk-doing-good

If you care about improving human lives, you should overwhelmingly care about those quadrillions of lives rather than the comparatively small number of people alive today. The 7.6 billion people now living, after all, amount to less than 0.003 percent of the population that will live in the future. It’s reasonable to suggest that those quadrillions of future people have, accordingly, hundreds of thousands of times more moral weight than those of us living here today do. That’s the basic argument behind Nick Beckstead’s 2013 Rutgers philosophy dissertation, “On the overwhelming importance of shaping the far future.” It’s a glorious mindfuck of a thesis, not least because Beckstead shows very convincingly that this is a conclusion any plausible moral view would reach. It’s not just something that weird utilitarians have to deal with. And Beckstead, to his considerable credit, walks the walk on this. He works at the Open Philanthropy Project on grants relating to the far future and runs a charitable fund for donors who want to prioritize the far future. And arguments from him and others have turned “long-termism” into a very vibrant, important strand of the effective altruism community. But what does prioritizing the far future even mean? The most literal thing it could mean is preventing human extinction, to ensure that the species persists as long as possible. For the long-term-focused effective altruists I know, that typically means identifying concrete threats to humanity’s continued existence — like unfriendly artificial intelligence, or a pandemic, or global warming/out of control geoengineering — and engaging in activities to prevent that specific eventuality. But in a set of slides he made in 2013, Beckstead makes a compelling case that while that’s certainly part of what caring about the far future entails, approaches that address specific threats to humanity (which he calls “targeted” approaches to the far future) have to complement “broad” approaches, where instead of trying to predict what’s going to kill us all, you just generally try to keep civilization running as best it can, so that it is, as a whole, well-equipped to deal with potential extinction events in the future, not just in 2030 or 2040 but in 3500 or 95000 or even 37 million. In other words, caring about the far future doesn’t mean just paying attention to low-probability risks of total annihilation; it also means acting on pressing needs now. For example: We’re going to be better prepared to prevent extinction from AI or a supervirus or global warming if society as a whole makes a lot of scientific progress. And a significant bottleneck there is that the vast majority of humanity doesn’t get high-enough-quality education to engage in scientific research, if they want to, which reduces the odds that we have enough trained scientists to come up with the breakthroughs we need as a civilization to survive and thrive. So maybe one of the best things we can do for the far future is to improve school systems — here and now — to harness the group economist Raj Chetty calls “lost Einsteins” (potential innovators who are thwarted by poverty and inequality in rich countries) and, more importantly, the hundreds of millions of kids in developing countries dealing with even worse education systems than those in depressed communities in the rich world. What if living ethically for the far future means living ethically now? Beckstead mentions some other broad, or very broad, ideas (these are all his descriptions): Help make computers faster so that people everywhere can work more efficiently Change intellectual property law so that technological innovation can happen more quickly Advocate for open borders so that people from poorly governed countries can move to better-governed countries and be more productive Meta-research: improve incentives and norms in academic work to better advance human knowledge Improve education Advocate for political party X to make future people have values more like political party X ”If you look at these areas (economic growth and technological progress, access to information, individual capability, social coordination, motives) a lot of everyday good works contribute,” Beckstead writes. “An implication of this is that a lot of everyday good works are good from a broad perspective, even though hardly anyone thinks explicitly in terms of far future standards.” Look at those examples again: It’s just a list of what normal altruistically motivated people, not effective altruism folks, generally do. Charities in the US love talking about the lost opportunities for innovation that poverty creates. Lots of smart people who want to make a difference become scientists, or try to work as teachers or on improving education policy, and lord knows there are plenty of people who become political party operatives out of a conviction that the moral consequences of the party’s platform are good. All of which is to say: Maybe effective altruists aren’t that special, or at least maybe we don’t have access to that many specific and weird conclusions about how best to help the world. If the far future is what matters, and generally trying to make the world work better is among the best ways to help the far future, then effective altruism just becomes plain ol’ do-goodery.\*

## Case

### Climate

#### Adaptation fails—divergent data and false modeling

Oreskes et al, ’10 [Naomi Oreskes, David A. Stainforth, Leonard A. Smith Philosophy of Science, Vol. 77, No. 5 (December 2010), pp. 1012-1028 “Adaptation to Global Warming: Do Climate Models Tell Us What We Need to Know?” http://www2.lse.ac.uk/CATS/publications/papersPDFs/80\_AdaptationtoGlobalWarming\_2010.pdf/]

This argument has been particularly promoted by the libertarian think tank, the CATO Institute, but some environmentalists accept it as well (e.g., Schellenberger and Nordhaus 2007). 3 When the Los Angeles Times summarized the views of advocates of adaptation, they glossed it this way: “Just deal with it” (Zarembo 2008). This gloss might be viewed as a bit misleading, because by and large advocates of adaptation are not arguing for simply responding to changes after they occur; they are arguing for preparing to adapt. But arguments for preparing for the consequences of global warming—rather than trying to prevent them—rest on the assumption that we know what “they” are. That is to say, they rest on the assumption that we can reliably anticipate the changes to which we will be adapting and therefore that we can sensibly plan for those changes. Do climate models give us the information we would need to accurately estimate the costs of adaptation and effectively prepare for the consequences of climate change? In this article, we argue that they do not. First, while climate models consistently suggest that the mean global temperature of the planet will rise, mean global temperature is not what any one person, state, or nation will be adapting to. Human beings will be adapting to changes in the weather at the places where they live and a host of concomitant local effects of climate change that ensue from such changes. While there is broad consensus on the expected change in average global temperature, there is much less agreement between models regarding these local changes and concomitant effects. In particular, there is widespread divergence in model simulations of the impact of global warm-ing on regional precipitation, a variable that is at least as important for human activities as temperature, if not much more so. Furthermore, models show systematic errors in the global mean temperature similar in magnitude to the size of the historical change we are seeking to understand. Models do not agree on the absolute value of the twentieth-century global warming temperature, but they do show close agreement on the size of the change over the past century. That is to say, while scientists agree that warming is underway, and broadly agree on the amount of anthropogenic change that has occurred to date, when we get down to the details of future changes and therefore anticipated future states, there is much less clarity and therefore much less agreement. Second, there is a gap between the scale on which models produce consistent information and the scale on which humans act. Planning for adaptation requires information on the scale over which human organizations and institutions have authority and power: towns, cities, states, provinces, and nations. The IPCC argues that current global circulation models (GCMs), with typical horizontal resolutions of 100–500 kilometers, provide “credible quantitative estimates of future climate change, particularly at continental scales and above”; phrasing that nods to the debates in the modeling community over their forecast skill on subcontinental scales (IPCC 2000). 4 Thus, while the reality of mean global warming is essentially undisputed, the future impacts on the scale at which humans would have to prepare for and adjust to them are still the subject of considerable research, inquiry, and debate (Oreskes 2004, 2007). Third, existing models are unable to simulate realistically (much less evaluate the likelihood of) extreme outcomes—a rapid disintegration of the West Antarctic Ice Sheet, for example, a major dieback of the Amazon, or a sudden increase in release of stored greenhouse gases from arctic permafrost. Yet, from a moral, ethical, and practical standpoint, our thinking must consider the ﬁnite (that is to say, nonzero) possibility that such outcomes may occur (Gardiner 2004). Our global models give us little relevant information regarding such perhaps unlikely, but potentially grave, impacts.

#### The aff displaces clean tech investments---turns climate

Bosello, ’05 [2005, Francesco Bosello works at the University of Venice, “Adaptation and Mitigation to Global Climate Change: Conflicting Strategies? Insights from an Empirical Integrated Assessment Exercise”, http://www.feem-web.it/ess/ess05/files/Bosello.pdf]

According to our model specifications, the possibility to invest in adaptation activities induces the central planner to decrease the amount of abatement and the amount of investment in R&D. There is a negative effect on CO2 emissions and temperature which increase. Nevertheless adaptation greatly reduces the negative impact of climate change. When adaptation is undertaken, abatement rates are significantly lower (-25% in 2000, -80% in 2100) compared to the case without R&D and adaptation (see fig.1). The stock of knowledge also declines (-5.8% in 2100 see fig. 2). Emissions accordingly increase (peeking to + 11 % and + 22% when investment in R&D is exogenous and endogenous respectively see fig. 3). Notwithstanding lower abatement and higher emissions, adaptation reduces consistently the negative impact induced by climate change on the economic system. Adaptation appears in the long term (fig.4). It starts to be appreciable after 2050 - when damage is reduced the 14% - and booms afterward - when damage is reduced up to the 50% - (see fig. 5). Note here that cases with and without R&D investment are very similar. These results highlight first that: (Investment in) Adaptation, (abatement) mitigation and (investment in) R&D are competing choices. This is not surprising: resources are finite; accordingly when a new option to fight climate change damage is viable and effectively undertaken a lower amount of resources is available to other strategies. Moreover adaptation, reducing the negative effect of environmental damage, also reduces the need to mitigate. More interesting is the fact that according to the model all the three strategies can coexist. As it is well known, optimality requires that in each period t the marginal cost of each strategy equals the discounted stream of its marginal benefits. At the same time marginal costs should be equalised between strategies. The result points out that no strategy fully dominates one of the other.

#### Climate change will inevitably overcome our ability to adapt—CBA proves a 3% risk of our turn is sufficient to vote neg

Room 8 [03/30/08, Joe Romm, “The adaptation trap 2: The not-so-honest-broker”, http://thinkprogress.org/climate/2008/03/30/202487/adaptation-trap-2-not-so-honest-broker-roger-pielke-jr/]

Adaptation as primary strategy for dealing with climate change is widely oversold. This is especially true as atmospheric Co2 concentrations approach 800 to 1000 ppm, a likely outcome if we listen to either the delayers or deniers. And a leader adaptation advocate and apparent delayer-1000, Roger Pielke, Jr., “labels adaptation what is in fact mitigation, and his idea of mitigation is apparently research into adaptation.” Let me elaborate on these points. The day before the dubious [pro-adaptation L.A. Times piece](http://www.latimes.com/news/science/la-sci-adapt26mar26,0,4227673.story?page=1), one of Pielke’s fellow Prometheus bloggers, Jonathan Gilligan, pointed out … if our political system stinks at managing floods, coastal storm risks, and fresh-water resources in the absence of anthropogenic climate change, why would it manage better if climate change does turn out to significantly increase the mean severity and/or variance of the distribution? I made a similar point last year on the second anniversary of hurricane Katrina, a catastrophe that “showed the limitations of adaptation as a response to climate change“: … a classic adaptation strategy to deal with rising sea levels is levees. Yet even though we knew that New Orleans would be flooded if the levees were overtopped and breached, even though New Orleans has been sinking for decades, we refused to spend the money to “adapt” New Orleans to the threat. We didn’t make the levees able to withstand a category 4 or 5 hurricane (Katrina was weaker at landfall than that, but the storm surge was that of a category 4). … even now, after witnessing the devastation of the city, we still refuse to spend the money needed to strengthen the levees to withstand a category 5 hurricane. We refuse to spend money on adaptation to preserve one of our greatest cities, ensuring its destruction, probably sometime this century. If we won’t adapt to the realities of having one city below sea level in hurricane alley, what are the chances we are going to adapt to the realities of having all our great Gulf and Atlantic Coast cities at risk for the same fate as New Orleans — since on our current path, climate change will ultimately put many cities, like Miami, below sea level? For some, of course, adaptation is a complete ruse: The fact is, the Denyers don’t believe climate change is happening, so they don’t believe in spending money on adaptation. [The Center for American Progress has written an important paper on hurricane preparedness](http://climateprogress.org/2007/08/27/%e2%80%9cforecast-storm-warning%e2%80%9d-preparing-for-global-warming/), which is a good starting point for those who are serious about adaptation. But don’t be taken in by heartfelt expressions of faith in human adaptability. If Katrina shows us anything, it is that preventing disaster would be considerably less expensive — and more humane — than forcing future generations to adapt to an unending stream of disasters [which is to say a permanently altered climate]. The nation and the world will obviously have to spend serious money adapting to global warming for two reasons. First, we’ve delayed action to reduce emissions for so long. Second, delayers like Pielke (and President Bush, Bj¸rn Lomborg, and Newt Gingrich) still have the upper hand in the debate (as the L.A.T article and [this Revkin NYT piece](http://climateprogress.org/2007/11/15/andy-revkin-e-o-wilson-suckered-by-newt-gingrich/) make clear), because the 1) technology trap is so appealing, 2) action requires a lot of effort, and 3) procrastination is always attractive option when someone is whispering in your ear that it is actually the best option. Note: The cleverest delayers, like Pielke, never oppose action completely, they just never tell you specifically what their targets and actions would be. So they get to take the high road and argue out of both sides of their mouths, effectively arguing — “We need both mitigation and adaptation, but even though I don’t think the problem requires urgent action like the advocates, take my word that I support just enough mitigation to avoid the part of climate change that can’t be adapted to.” Unfortunately, the part of climate change that can’t be adapted to is coming much faster than we feared. If we can keep total warming from preindustrial levels to 2°C or lower, than genuine adaptation is possible. The more we go above 2°C, the more adaptation will be replaced by suffering. LIVING/SUFFERING IN A 1000 PPM WORLD I listed only three catastrophes that would probably occur at 800 to 1000 ppm because I think those are the most serious and most inevitable. But they are hardly the only ones. A major 2005 study of the impacts of about 800 ppm on the United States found in the second half of this century (from 2071 to 2095) a vast swath of the country would see average summer temperature rise by a blistering 9°F. Houston and Washington, DC would experience temperatures exceeding 98°F for some 60 days a year. Oklahoma would see temperatures above 110°F some 60 to 80 days a year. Much of Arizona would be subjected to temperatures of 105°F or more for 98 days out of the year–14 full weeks. We won’t call these heat waves anymore. As the lead author, Noah Diffenbaugh, of Purdue University said to me, “We will call them normal summers.” Climate scientists don’t spend a lot of time studying 800 to 1000 ppm, in part because they can’t believe humanity would be so self-destructive as to ignore their increasingly dire warnings and fail to stabilize at well below 550 ppm. The IPCC notes that if equilibrium CO2-equivalent concentrations hit 1000 ppm, [the “best estimate” for temperature increase is 5.5°C (10°F](http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf)), which means that over much of the inland United States, temperatures would be about 15°F higher. This increase would be the end of life as we know it on this planet. Interestingly, 5.5°C is just about the temperature difference between now and the end of the last ice age, the difference between a livable climate for human civilization that is well suited to agriculture and massive glaciers from the North Pole down to Indiana. Is it 100% certain that 1000 ppm would result in Sea level rise of 80 feet to 250 feet at a rate of 6 inches a decade; Desertification of one third the planet and drought over half the planet, plus the loss of all inland glaciers; and More than 70% of all species going extinct, plus extreme ocean acidification? Of course not. Such certainty is not possible for a climate transition that is completely unprecedented in the history of the human species. I can state with very high confidence that the possibility all of those outcomes will occur is higher than the world seeing even a single “science and engineering-based technological breakthrough” (let alone several as delayers like Pielke seem to be counting on) in the next quarter century or so significant enough to somehow avert such catastrophes far more cheaply than simply acting now with existing technology to avoid 450 ppm. Importantly, even a 3% chance of a warming this great is enough to render useless all traditional cost-benefit analyses that argue for delay or only modest action, as [Harvard economist Martin Weitzman has shown](http://climateprogress.org/2007/09/11/weitzman-economics-climate-change-catastrophe/). Yet, absent immediate and strong action, the chances of such warming and such effects are not small, they are large — greater than 50%. These impacts seem especially likely in an 800 to 1000 ppm world given that the climate appears to be changing much faster than the IPCC had projected. The Greenland and Antarctic ice sheets already appear to be shrinking “100 years ahead of schedule” as Penn State climatologist Richard Alley put it in March 2006. Indeed, a number of peer-reviewed articles have appeared in the scientific literature in the past 18 months supporting the real possibility of a 6-inch-a-decade sea level rise. As for desertification, “The unexpectedly rapid expansion of the tropical belt constitutes yet another signal that climate change is occurring sooner than expected,” noted one climate researcher in December. As a recent study led by NOAA noted, “A poleward expansion of the tropics is likely to bring even drier conditions to” the U.S. Southwest, Mexico, Australia and parts of Africa and South America.” In 2007, the IPCC warned that [as global average temperature increase exceeds about 3.5](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf)°C [relative to 1980 to 1999], model projections suggest significant extinctions (40-70% of species assessed) around the globe. That is a temperature rise over pre-industrial levels significantly exceeding 4.0°C. So a 5.5°C rise would likely put extinctions beyond the high end of that range. And these horrific impacts are certainly not the worst-case scenario. As NASA’s James Hansen explained in a 2004 Scientific American article: The peak rate of deglaciation following the last Ice Age was … about one meter [39 inches] of sea-level rise every 20 years, which was maintained for several centuries. Imagine sea level rise of nearly 20 inches a decade lasting centuries. Now imagine what future generations will think of us if we let it happen. A year ago [Science](http://www.sciencemag.org/cgi/content/short/316/5828/1181) (subs. req’d) published research that “predicted a permanent drought by 2050 throughout the Southwest” — levels of aridity comparable to the 1930s Dust Bowl would stretch from Kansas to California. And they were only looking at a 720 ppm case! The Dust Bowl was a sustained decrease in soil moisture of about 15% (“which is calculated by subtracting evaporation from precipitation”). Even the one-third desertification of the planet by 2100 scenario by the Hadley Center is only based on 850 ppm (in 2100). Princeton has done an analysis on “Century-scale change in water availability: CO2-quadrupling experiment,” which is to say 1100 ppm. The grim result: Most of the South and Southwest ultimately sees a 20% to 50% (!) decline in soil moisture. You may be interested in how fast we can hit 1000 ppm. Well, the Hadley Center has one of the few models that incorporates many of the major carbon cycle feedbacks. In [a 2003 Geophysical Research Letters (subs. req’d) paper, “Strong carbon cycle feedbacks in a climate model with interactive CO2 and sulphate aerosols,”](http://www.agu.org/journals/gl/gl0309/2003GL016867/) the Hadley Center finds that the world would hit 1000 ppm in 2100 even in a scenario that, absent those feedbacks, we would only have hit 700 ppm in 2100. I would note that the Hadley Center, though more inclusive of carbon cycle feedbacks than most other models, still does not model any feedbacks from the melting of the tundraeven though it is probably the most serious of those amplifying feedbacks. Clearly, 800 to 1000 ppm would be ruinous to this country, creating unimaginable suffering and misery for billions and billions of people for centuries to come. No one who believes in science and cares about humanity can possibly believe that adaptation is a more rational or moral policy than focusing 99% of our climate efforts on staying far, far below 800 ppm.

#### This is net offense—absent mitigation now, adaptation is impossible—vote negative on presumption

Oreskes et al, ’10 [Naomi Oreskes, David A. Stainforth, Leonard A. Smith Philosophy of Science, Vol. 77, No. 5 (December 2010), pp. 1012-1028 “Adaptation to Global Warming: Do Climate Models Tell Us What We Need to Know?” http://www2.lse.ac.uk/CATS/publications/papersPDFs/80\_AdaptationtoGlobalWarming\_2010.pdf/]

One thing, however, is virtually certain: the less we mitigate, the more we shall have to adapt. Furthermore, the less we mitigate, the more likely we are to face challenges that surpass our capacity to adapt without pain and suffering. Broadly speaking, the greater the burden of greenhouse gases in the atmosphere and the oceans, the greater the environmental impact will be. So the less we control those gases, the more likely it is that the ensuing climate changes will be difﬁcult to manage. If we do nothing at all, the odds of catastrophic outcomes increase substantially, and in the face of such outcomes our ability to “just deal with it” may well vanish entirely. Furthermore, the impacts of climate change—and thus the burden of adaptation—will be distributed without regard to prior greenhouse gas contributions, so the unjust ethical impacts of climate change increase as well. And the less we mitigate, the more burden there will be.

#### No risk of offense -- Adaptation can only happen if climate is stabilized – stopping emissions is a prerequisite

Hoegh-Guldberg 11 [Ove, professor of biology at the University of Queensland and Director of the Global Change Institute of the University of Queensland, “Coral reef ecosystems and anthropogenic climate change,” Regional Environmental Change, 3/2/11, tony]

In leaving this discussion of the potential for rapid adaptation, it is important to note that greenhouse gas stabilization is a central requirement to any adaptive response by life on our planet. Climate change under mid to high-range emission scenarios is characterized by continuously changing climate for many hundreds if not thousands of years (IPCC 2007). This has important implications for the expectation of how populations of corals and other coral reef organisms may change. For example, if we were to stabilize global temperatures at 2C above present-day conditions (i.e., low emission scenarios), coral populations would see an initial decrease in population size as unfit genotypes are eliminated followed by the proliferation of fit genotypes at the new temperature. We might also expect the migration of thermally tolerant lower-latitude genotypes to migrate to more poleward higher latitude reefs over time (probably over decades) and for these genotypes to flourish at these higher latitude sites as conditions stabilized (the influence of ocean acidity set aside). Without stabilization of greenhouse gas concentrations, however, conditions and therefore the associated intense selective pressure would continue to operate on new migrants, preventing their proliferation of across the more high-latitude locations. Corals and their many dependents would necessarily remain at low abundances under these higher emission scenarios.

### Neutrino

#### This prolif internal link is nonsensical – their evidence asserts that countries would stop building bombs because there’s more data – if countries have the motive to and are actively building or pursuing WMDs they’d think that they’d get away with it and independently they could just offshore to a country that already has nukes

#### They cannot solve the unraveling prolif intnl link either – their evidence Identifies that barriers to prolif and detection are unraveling incredibly quickly which means that we need a quick response which is not what neutrino research is

#### Also not a complete scenario – they’ve read prolif easy and possible evidence but have not identified who will proliferate or why motive exists

#### Their Kroenig evidence – perception of prolif I.e thinking that a state is developing nucs still triggers the impact – they would have to win that they so deter nuclear development so much that no country even develops nuclear power or research in that area