Should the United States Make Unilateral Greenhouse Gas Emissions Reductions? Evaluating the Policy Implications of Co-benefits, the Social Cost of Carbon, and the Desire to be a Leader Without Being a Sucker[*]

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From a *normative* perspective that evaluates what *should* be done about climate change, many would argue that wealthy, high-emitting nations like the United States should make substantial greenhouse gas (GHG) emissions reductions even if other high emitting nations are not currently reciprocating. We might call this the **Unilateral Reductions View**.

The Unilateral Reductions View faces an important objection, which is that if nations make reductions unilaterally, this will make no meaningful difference to the climatic outcome, and will only prevent wealth creation and waste resources that could have been better invested in other ways. This objection might be called the **Futility Objection**. When this objection is developed in a sophisticated form, many commentators believe that it provides an objection to unilateral reductions that is worthy of serious consideration.[1] In this paper, I consider existing responses to a sophisticated version of the Futility Objection. I argue that they are inadequate, and I argue that contrary to these responses the Futility Objection succeeds in showing that nations like the United States should not make *substantial* unilateral reductions, where 'substantial' is understood to mean reductions equal to the magnitude of reductions that would result from a domestic carbon tax set equal to the social cost of carbon, which is currently estimated by the U.S. Environmental Protection Agency (EPA) to be approximately $40 per ton.

At the same time, I argue that the considerations identified by existing responses to the Futility Objection do constitute good reasons for *some* unilateral

[*] Thanks to [omitted], and to audiences at the 2013 Eastern APA and UC Berkeley.

[1] Cass Sunstein plays up the importance of the Futility Objection in a recent op-ed, calling it "the Sophisticated Objection", and contrasting it with climate skepticism and other "bad objections" to taking action on climate change – instead calling a sophisticated version of the Futility Objection "legitimate", and insisting that it "deserves respectful consideration". (Sunstein, "U.S. Should Act Unilaterally on Climate Change", Bloomberg, 23 January 2013. All subsequent references to Sunstein are to this article unless otherwise noted.)

emissions reductions, but that the magnitude of the reductions supported by those considerations is only a fraction of what such commentators suggest. I also explain why these conclusions hold even when the **co-benefits** of emissions reductions are taken properly into account, where co-benefits include benefits to human health that would result as a welcome side effect of greenhouse gas emissions reductions, but are not captured by the social cost of carbon accounting because they are not benefits directly tied to climate. Along the way, I argue that the social cost of carbon is a highly unreliable – and arguably inappropriate – metric for the domestic climate policy decisions that it currently informs.

With that overview in hand, the Futility Objection to the Unilateral Reductions View might be understood as the following if it is to be understood in its most sophisticated form:

Futility Objection

(1) Climate change arises from a collective action problem that will not be successfully addressed without **reliable, substantial, and coordinated global action**.[2]

(2) In the absence of that kind of global action, unilateral emissions reductions impose serious burdens on nations making the reductions but **make no meaningful difference** to the climatic outcome. For example, in the absence of global action, if the United States makes substantial unilateral reductions by capping emissions at 2000 levels, this would impose burdens on the United States and its citizens but would do nothing meaningful about the climate problem, because it would likely result only in a trivial mitigation of temperature increase, which would

[2] Barrett, Environment and Statecraft, Nordhaus, Stern. From the Intergovernmental Panel on Climate Change (IPCC) report Climate Change 2007: The Physical Science Basis: "The concentration of greenhouse gas in the atmosphere depends on the competition between the rates of emission of the gas into the atmosphere and the rates of processes that remove it from the atmosphere. For example, carbon dioxide (CO_2) is exchanged between the atmosphere, the ocean, and the land through processes such as atmosphere-ocean has transfer and chemical (e.g. weathering) and biological (e.g. photosynthesis) processes. While more than half of the CO_2 emitted is currently removed from the atmosphere within a century, some fraction (about 20%) of emitted CO_2 remains in the atmosphere for many millennia. Because of slow removal processes, atmospheric CO_2 will continue to increase in the long term even if its emission is substantially reduced from present levels. … More specifically, the rate of emission of CO_2 currently greatly exceeds its rate of removal, and the slow and incomplete removal implies that small to moderate reductions in its emissions would not result in stabilization of CO_2 concentrations, but rather would only reduce the rate of its growth in coming decades. A 10% reduction in CO_2 emissions would be expected to reduce the growth rate by 10%, while a 30% reduction in emissions would similarly reduce the growth rate of atmospheric CO_2 concentrations by 30%. A 50% reduction would stabilize atmospheric CO_2, but only for less than a decade. After that, atmospheric CO_2 would be expected to rise again as the land and ocean sinks decline owing to well-known chemical and biological adjustments" (pp. 824-825). For further ramifications for greenhouse gas stabilization levels, see The Economics of Climate Change: The Stern Review, Chapter 8.

not prevent any of the terrifying potential consequences of climate change, except at best to delay them by an inconsequentially short period of time.[3]

(3) If (2) is true, then bearing the burdens of unilateral reductions **cannot be justifiably demanded** of citizens.

In light of (1), (2), and (3), (the Futility Objection concludes that) nations should not be *unconditional cooperators* by making unilateral emissions reductions. Instead, nations should be **conditional cooperators** in connection with climate change: that is, they should agree to a collective course of action for global emissions reductions that is best, and bind themselves to and make their share of those reductions **if and only if** others around the world bind themselves to and make their share of those reductions as well.

In sum, the Futility Objection insists that the Unilateral Reductions View overlooks the futility and unjustifiability of unilateral action within the collective action problem that lies behind climate change, and thus the inadvisability of unilateral action from a normative point of view.

Proponents of the Futility Objection might also argue that their view fits well with general principles about the ethics of collective action, such as that even if *free-riding* is generally impermissible in response to the general cooperation of others, at the same time one is not generally required to be a *sucker* by cooperating in the face of the non-cooperation of others – and that the proper response when a tragedy of the commons threatens is generally not futile and self-sacrificing unilateral action, but rather *mutual cooperation mutually agreed upon*, just as the conclusion of the Futility Objection claims is appropriate in response to climate change.[4]

Whatever we ultimately make of the Futility Objection, one of its virtues is in focusing our attention on some of the most important moving parts of the contemporary debates among researchers in science, politics, economics,

[3] For example, "suppose that the United States committed to significant reductions on its own—by, say, capping emissions at the rates prevailing in 2000. If so, the commitment would have little discernible effect on climate change by 2100 (again probably under 0.01°C). By itself, such an approach would impose real costs on the United States, while benefiting that nation very little or perhaps not at all, and failing to do much for the world as a whole. … unilateral action, even by the largest emitters, will accomplish so little. Such action cannot affect the existing stock, and by definition, it will do nothing (directly) about the rest of the flow." (Posner and Sunstein pp. 1576 and 1580, relying on Nordhaus and Boyer, *Warming the World: Economic Models of Global Warming*, esp. pg. 152).

[4] For further discussion of this in connection with the ethics of collective action, see my paper "Collective Action, Climate Change, and the Ethical Significance of Futility". 'Mutual cooperation, mutually agreed upon' is intended to be a more general form of Hardin's "mutual coercion, mutually agreed upon", which captures the insight that tragedies of the commons can often be avoided by 'bottom-up' cooperation, or by the assignment of property rights in a way that we would not normally see as particularly coercive, etc. Ostrom, Coase, Rose.

philosophy, and law about relevant dimensions of the *normative* question of **what we *should* do about climate change**. For example, many economists and political scientists argue for claim (1) within the Futility Objection about the need for reliable, substantial, and coordinated global action, while others argue that a more diverse and less coordinated series of incremental steps and policies by actors and coalitions at all levels from the individual to the national to the international is the best way to move gradually in the right direction, building in new directions and deepening existing forms of cooperation over time.[5] At the same time, scientists and economists contribute through integrated assessment models to a more precise characterization of the global emissions reduction path that would be best, which informs those who seek global action via one or another of these routes.

Some economists agree with the basic point made by (2) about the relative futility of unilateral action, while others work toward offering a more precise characterization of the expected magnitude of emissions leakage given various forms of unilateral domestic action, while others investigate other relevant issues.[6]

Many philosophers, environmentalists, and others argue that the main problem with the Futility Objection is that premise (3) is false even if the truth of all of the other premises are granted, on the grounds that (3) mistakenly assumes that only welfare-based reasons are relevant to what we should do, when in fact (according to these theorists) non-welfarist considerations of justice or human rights 'trump' or 'swamp' welfarist considerations in one way or another, and tell

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[5] "Graduation and Deepening" in architectures for agreement", Ostrom "Green from the Grassroots". David Victor.

[6] For example, recent modeling results have suggested that the magnitude of leakage that should be expected as a result of unilateral reductions is somewhat smaller than it may seem on a priori grounds – for example, see Energy Economics, vol 34 supplement 2 dec 2012. Unlike researchers in the previously cited disciplines who tend to focus on questions about what *we as a world* or what *we as a nation* should do about climate change, philosophers are sometimes also concerned with the question of what *you and I as individual people* should do about the problem, which leads to the question of whether the futility objection might *succeed* in showing that individual people lack an obligation to make unilateral reductions but yet *fail* to show that nations lack such an obligation; a further more philosophical question is whether there are different principles of the ethics of collective action that explain the correct answers at both of those levels. My own view is that a single set of principles capture the ethics of collective action at both the individual and collective levels. For my own views on the content of these principles, see my discussion of the Non-Cooperation Principle and other considerations in "Collective Action, Climate Change, and the Ethical Significance of Futility". Here I focus only on evaluating whether the United States and other *nations* should make unilateral emissions reductions, partly because in this and other papers I've evaluated the objection at length in connection with the question of whether *individual people* like you and I should make unilateral reductions. In those papers I argue that the Futility Objection is indeed a sound objection to the claim that individual people are required to make unilateral reductions, and I explain how taking the objection seriously at that level helps to shed important light on the ethics of collective action and the nature of moral reasons more generally. An important contrary view is that of John Broome, who tackles the Futility Objection head-on in *Climate Matters* when discussing the question of what individuals should do about climate change, endorsing a deontological view for individual ethics (which, interestingly, he rejects at the level of public policy). However, curiously, Broome ignores the Futility Objection when he discusses what should be done at the level of public policy.

decisively in favor of substantial unilateral reductions. We might call these **Justice-Based Responses** to the Futility Objection, where this is understood as a catch-all category for responses that reject welfarism (where '**welfarism**' is understood as the view that a society should maximize welfare, in the sense familiar from economics in which the welfare of group such as a nation is a function of the consumption of the individual people who compose it, together with other possible determinants of their individual wellbeing).

In what follows, I will initially set aside Justice-Based Responses to the Futility Objection, and focus first on the prospects for a **Welfarist Response**, which insists that the main problem with the Futility Objection is that premise (2) is false even if the truth of (1) and (3) are granted. Such a response claims that, contrary to (2), unilateral reductions can be expected to make a meaningful difference on balance by increasing social welfare.

There are two important reasons for focusing initially on the prospects for such a Welfarist Response. The first reason is that many influential policy commentators assume that the only possible response to the Futility Objection is a Welfarist Response, because they endorse a welfare economics approach to public policy that implies that premise (3) is true, and they also believe that premise (1) is true based on the nature of the climate change problem. So, from this influential perspective, a Welfarist Response is the only game in town. (A '**welfare economics approach**' to policy consists in (a) welfarism, together with (b) a standard economic approach to estimating the relevant welfare consequences – in the case of climate change, via the sort of integrated assessment models that are familiar from the work of Nicholas Stern, William Nordhaus, and many others.[7])

The second reason for focusing first on the prospects for a Welfarist Response is that even if one rejects the welfare economics approach to public policy and instead endorses a justice-based view, it remains true even on a justice-based view that the costs and benefits of policy options are *relevant* to what nations should do (even though on such a view they are not the *only* thing that is relevant) – and so if it can be shown that the benefits of unilateral action outweigh the costs, that appears to be an independently sufficient response to the Futility Objection even from the perspective of a justice-based view. As a result, evaluating the prospects for a Welfarist Response is of great importance to thinking about what nations should do about climate change even from a non-welfarist point of view.

[7] Nordhaus and Stern.

With that overview in hand of the importance of both the Futility Objection and Welfarist Responses, I turn now several Welfarist Responses to the Futility Objection defended by Cass Sunstein, because they are particularly clear and representative of what many leading commentators take to be the correct way of responding to the Futility Objection [8] Sunstein identifies three independent arguments that the benefits of unilateral action by the U.S. outweigh the costs, and are therefore justified on welfarist grounds. From these, it is supposed to follow that the burdens of unilateral reductions made by the U.S. can be justified to U.S. citizens, contrary to what the Futility Objection claims.

The first of these three arguments is perhaps the most straightforward, and is also an argument that many policymakers who subscribe to the welfare economics approach appear to endorse. The argument is that given our best estimate of the social cost of carbon (currently somewhere in the neighborhood of $40 a ton if EPA estimates are taken as a guide),[9] a nation like the U.S. has "pragmatic" reason to unilaterally reduce emissions to the extent and in the way that would be efficient given a carbon tax of that magnitude.

Unfortunately, there are a number of independent problems with this argument. The first problem is that the phenomenon of emissions leakage ensures that the actual benefits of unilateral reductions are much less than is suggested by the social cost of carbon, which is a measure of what the social benefit would be of reductions in *global* emissions. But emissions leakage ensures that unilateral reductions of *domestic* emissions will yield a much smaller reduction in *global* emissions. So, the actual benefits of unilateral reductions will be only a fraction of the benefits suggested by the social cost of carbon – roughly, the benefits that derive from the fraction of emissions that do not 'leak'. Given that emissions leakage is a problem on any view – somewhere in the neighborhood of 50% on many views[10] – this is sufficient to undermine the idea that *substantial* unilateral reductions are justified in a straightforward way on welfarist grounds based on the social cost of carbon, given that 'substantial' reductions are, again, here understood as reductions approximately equal to or greater than those that would result from a domestic carbon tax equal to the social cost of carbon.

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[8] Sunstein, "U.S. Should Act Unilaterally on Climate Change".

[9] Sunstein bases his estimate on numbers from the Interagency Working Group on the Social Cost of Carbon, as reported in the United States Government Technical Support Document, "Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866"; however, subsequent to Sunstein's editorial, the estimate of the social cost of carbon has been revised upward in "Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866". I use the latter numbers here.

[10] Energy Economics, vol 34 supplement 2 dec 2012

A second problem is that the vast majority of the costs of emissions that are reflected in social cost of carbon estimates are due to costs imposed on non-U.S. citizens by carbon emissions, and so such a number is not an accurate measure of what emissions reductions it is in the "pragmatic" self-interest of the U.S. to make. For example, in the EPA report from which Sunstein takes his social cost estimate, the only estimate of the *domestic* social cost of carbon that is cited and compared to the *global* social cost is a mere 6% of the global social cost, which given the most recent central estimate of a global social cost of around $40 would work out to a domestic cost of a mere $2.40 a ton. (As the report explicitly notes, "A domestic SCC value is meant to reflect the value of damages in the United States resulting from a unit change in carbon dioxide emissions, while a global SCC value is meant to reflect the value of damages worldwide."[11]) So, if the issue is what magnitude of unilateral emissions reductions it is in the "pragmatic" self-interest of the U.S. to make, it is a mistake to think that the answer is given by the (global) social cost of carbon. Instead, the carbon tax that would be justified on grounds of self-interest may be somewhere more in the neighborhood of a few dollars, which is a tax rate that would not result in anything like *substantial* unilateral emissions reductions in the sense defined above.

In response, welfarists have the option of arguing that unilateral emissions reductions by the U.S. are justifiable to U.S. citizens even if they are quite contrary to their interests, so long as such reductions result in a better outcome for the world as a whole. One objection to this response derives from the objection above regarding emissions leakage, which demonstrated that even the global social cost of carbon is not a reliable indicator of the amount of good done by unilateral emissions reductions. A more fundamental problem is that even assuming that welfarism is correct (again, the view that the only facts relevant to policy decisions are facts about welfare consequences), this response invokes the further and much more radical **cosmopolitan** claim that the welfare of a nation's own citizens should not be given priority in a nation's own policy decision over the welfare of individuals in other nations. If this radical claim were true about how nations should make policy decisions, then it would follow that the U.S. should confiscate the vast majority of the wealth of its citizens and transfer it to poor people abroad insofar as that wealth would do more good for those people than it would for people in the U.S. These radical implications would be rejected by the vast majority of citizens, and can be

[11] United States Government Technical Support Document, "Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866", pg. 3.

reasonably rejected by them according to political philosophers like John Rawls and other **statists** who reject cosmopolitanism, and instead insist that such cosmopolitan redistributive principles cannot be justified.[12] Furthermore, in the climate debate at issue, cosmopolitanism appears to be exactly the sort of radical view that commentators like Sunstein attempt to avoid when they choose rhetoric that paints substantial unilateral reductions as in the "pragmatic" self-interest of the U.S.

On the other hand, a complication in the other direction is that the estimate of domestic cost that should be used in connection with self-interested emissions policy is likely higher than the domestic social cost of carbon, because domestic cost estimates should also take into account the fact that some emissions reductions have net negative costs,[13] and that there are significant co-benefits to reducing emissions, such as avoiding negative health effects due to pollution and particulate emissions that would be reduced as a side-effect of greenhouse gas emissions reductions but that are unrelated to climate change, all of which are generally ignored by social cost of carbon estimates.[14]

However, the question of how co-benefits should affect greenhouse gas emissions reductions policy is also more complicated than it initially appears because of the highly localized facts that are relevant in the case of co-benefits but not greenhouse gas emissions. As a specific example to illustrate, there are two large greenhouse gas sources in California such that the same quantity of greenhouse gas emissions reductions would have 10,000 times greater benefit if it occurred at one of those sources rather than the other, because one is in a highly populated area (where more people suffer the negative effects of the pollution) whereas the other is not.[15] In contrast, the same benefits accrue with respect to climate change regardless of where greenhouse gas emissions reductions occur. As this illustrates, even if we care deeply about the possible co-benefits of greenhouse gas emissions reductions policy, it is likely inefficient to rely on familiar market-based GHG reduction policies to realize those benefits, because those policy measures and the incentives they create are indifferent between reductions that take place at locations that would have

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[12] Rawls, *The Law of Peoples*. For some general discussion of statist vs. cosmopolitan views, see Mathias Risse, *On Global Justice*, Michael Blake and Patrick Taylor Smith, "International Distributive Justice", Laura Valentini, *Justice in a Globalized World*.

[13] McKinsey.

[14] For further discussion of the nature of co-benefits to emissions reductions, see the chapter in the recent IPCC 2014, *Impacts…* report. See also Muller and Mendelsohn, Using Marginal Damages in Environmental Policy, AEI, 2013; Boyce and Pastor, "Cooling the Planet, Clearing the Air: Climate Policy, Carbon Pricing, and Co-Benefits"

[15] Boyce and Pastor, "Cooling the Planet, Clearing the Air: Climate Policy, Carbon Pricing, and Co-Benefits", pg. 17.

enormous co-benefits vs. locations that would have zero co-benefits or even net co-costs, as I explain in more detail in what follows.

To unpack this issue further, it is crucial to recognize that although it may appear *likely* that the co-benefits of greenhouse gas emissions reductions would exceed the costs of those reductions up to some level, it is not *obvious* that this would be the case, at least under a market-based policy. That is because a carbon tax *could* have the perverse effect of reducing emissions from powerplants farther away from population centers while leading to an increase in emissions at more cost-effective power plants that could turn out to be closer to population centers, which if true would have the effect of making the relevant health outcomes *worse* on balance. In fact, the evidence indicates that this is exactly what has happened in the U.S. as a result of market-based SO2 reductions, where health outcomes have actually been made much worse by that market-based policy than they would have been with the same level of SO2 reductions achieved via more traditional 'command and control' regulation that was mindful of the location of emissions. In fact, modeling results indicate that the additional costs in the form of negative health impacts due to the actual market-based SO2 policy in the U.S. are many times greater than the benefits in the form of cost effectiveness gained from that policy.[16]

In addition to providing a cautionary tale for market-based policy, the upshot of this example for GHG policy is that although it appears likely that GHG reductions would have additional co-benefits, it is important to recognize that they may also have significant co-costs, especially if achieved via the forms of market-based policy that are favored by policy commentators, and it is not empirically obvious to what extent the co-benefits would outweigh the co-costs – or whether they would outweigh them at all.

As a result, there are empirical reasons for thinking that co-benefits, although crucially important to correct policy evaluation, cannot simply be based on calculations derived from the *average* co-pollutant intensity of GHG emissions from particular types of sources (such as the *average* co-pollutant intensity of emissions from coal powerplants), but must instead be demonstrated to be expected on net via sophisticated integrated assessment modeling that investigates the spatial redistribution of co-pollutants between sources that is to be expected as a consequence of the relevant policy (such as a carbon pricing scheme, or a more complex policy portfolio such as the EPA's recent GHG regulations). At this point, no such demonstration has been given in the U.S. or elsewhere. And, as the case

[16] Muller and Mendelsohn, *Using Marginal Damages in Environmental Policy*, AEI, 2013

study of SO2 trading in the U.S. illustrates, there are good reasons to worry that such modeling might indicate that we should expect *net co-costs* from a familiar market-based GHG reduction policy, rather than net co-benefits – especially because GHG regulations tend to be agnostic about the location at which GHG reductions occur, given the emissions location-agnostic nature of the GHG problem.

Furthermore, even if it were demonstrated that a particular GHG reductions policy would have net co-benefits, there would still be the question of whether those same benefits could be captured at a much lower cost via alternative policy measures such as 'end of pipe' technologies. If they could be realized at lower cost via alternative policy measures, then it would be a mistake of cost/benefit analysis and welfarist reasoning to assume that the GHG policy would be justified simply because its cost/benefit profile was better than the status quo; instead, such an intervention would not be justified on welfarist grounds if its welfarist profile was inferior to alternative, equally feasible policy portfolios in that domain (of both climate and health impacts). To illustrate this point further, consider the following numbers suggested by Robert Stavins as representative of the costs and benefits of the EPA's proposed GHG regulations:[17]

[17] Robert Stavins, "What are the Benefits and Costs of EPA's Proposed CO2 Regulation?", *An Economic View of the Environment* blog, 19 June 2014 (retrieved 13 March 2015). See also Stavins, "EPA's Proposed Greenhouse Gas Regulation: Why are Conservatives Attacking its Market-Based Options?", An Economic View of the Environment blog, 5 June 2014.

Benefits and Costs of EPA's Proposed Clean Power Plan Rule in 2030

(Mid-Point Estimates, Billions of Dollars)

	Climate Change Impacts		Health Impacts (Co-Benefits) of Correlated Pollutants plus …	
	Domestic	Global	Domestic Climate Impacts	Global Climate Impacts
Benefits				
Climate Change	$3	$31	$3	$31
Health Co-Benefits			$45	$45
Total Benefits	$3	$31	$48	$76
Total Compliance Costs	$9	$9	$9	$9
Net Benefits *(Benefits – Costs)*	**($6)**	**$22**	**$39**	**$67**

If these numbers were assumed to capture all of the relevant costs and benefits of the proposed GHG regulations, and thus even if it were assumed that the proposed GHG regulations would have net co-benefits of $45 billion as reported in the third column from the left (which is a problematic assumption given the previous arguments, which call into question the methodology behind such estimates), there would still be the question of whether that $45 billion of benefits could be captured via alternative policy at a cost of less than $6 billion dollars. If that $45 billion of health benefits could be captured for significantly less than $6 billion, and if doing so would also have domestic climate co-benefits that captured some of the $3 billion in benefits promised by the GHG regulations (as would likely be the case), then it

could easily be true that an alternative policy portfolio that included that alternative capture of benefits would be superior on welfarist grounds to the proposed GHG regulations.

In sum, the main point here is that for all of these reasons, the social cost of carbon is a highly unreliable – and arguably inappropriate – measure of what emissions reductions are in a nation's domestic self-interest.[18] These points have general importance to climate policy, because they highlight the problematic assumption of many governmental working groups that the (global) social cost of carbon is the correct metric for making decisions about domestic climate policy. The preceding discussion shows that standard welfarist rationales for this assumption are confused for a number of independent reasons. As a result, if there is to be any straightforward justification for using the social cost of carbon as the correct metric for domestic environmental policy, it appears that such a justification must be on grounds of (global) justice rather than on welfarist grounds, contrary to what commentators like Sunstein and others suggest.

Of course, for all that has been said so far, it possible that such a justice-based justification might be given – the point so far has been merely to argue against a welfarist justification. However, in light of all the preceding, we are now in a position to see that there is an important objection even to a justice-based justification for unilateral reductions – for example, a justice-based justification that claims that the U.S. has a special obligation to give weight to the interests of people in other nations in connection with climate change because the U.S. is wealthier and/or bears a greater responsibility for the threats associated with climate change. The objection is that even if such a justice-based view about the special obligations of the U.S. is granted, and even if we assume that unilateral reductions by the U.S. would make some meaningful difference to the climate outcome and succeed in helping those vulnerable to the effects of climate change *to some extent*, nonetheless it could be that there are other much more effective ways of combating climate change and helping those vulnerable people *to an even greater extent with the same investment of resources*. This problem might be called the *Problem of Better Alternatives Than Unilateral Reductions* – and the last point above about co-benefits provides another illustrative instance of this problem. This problem threatens justice-based responses to the Futility Objection, and also undermines welfarist arguments even if radical cosmopolitanism is assumed. As a result, this

[18] There are also legal questions about whether the EPA has the authority to include global benefits in its regulatory decision-making. My arguments here are independent of those legal issues.

problem is arguably the most fundamental problem for responses to the Futility Objection.

To make the nature of this problem as clear as possible, it may help to consider a specific example that illustrates the problem from a welfarist perspective, returning to justice-based views further below. So, consider the outcomes of three possible responses to climate change: first, the outcome of business as usual with no policy response; second, a response that involves substantial unilateral reductions; third, a response that does not involve unilateral reductions but involves some other alternative response – as just one familiar example that it is worth highlighting in this context, such an alternative response might involve **geoengineering via solar radiation management**, perhaps as one 'short-term' part of a more complex policy portfolio. If such an alternative response would be – as some experts claim – vastly more cost effective than substantial unilateral reductions, then geoengineering is the preferred option on cost/benefit grounds, and substantial unilateral reductions are not preferable on cost/benefit grounds, even if unilateral reductions are an improvement over business as usual. Again, it would be a mistake of cost/benefit analysis to assume that a policy in a domain is justified whenever its cost/benefit profile is better than the status quo; instead, such an intervention is justified on cost/benefit grounds only if its cost/benefit profile is as good as all equally feasible alternative policies in that domain.[19]

The upshot is that conclusions about the preferability on welfarist grounds of unilateral reductions would not follow even if we set aside all of the other problems above – because at best it would follow only that unilateral reductions are an improvement over the status quo, and not that unilateral reductions are the best response. Furthermore, given the **empirical** disagreements about the alternatives to unilateral reductions, and the fact that some experts argue that there really are better alternatives that do not involve unilateral reductions, the important point is that in addition to calling into question the validity of arguments for unilateral reductions, these alternatives also call into question the **truth** of the idea that we should make unilateral reductions.[20]

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[19] OMB Circular A-9 – OMB guidance for RIAs, stress test greater and lesser stringent policies

[20] For example, if the claims of geoengineering proponents are even approximately true, then geoengineering dominates all other responses to climate change on cost/benefit grounds, and substantial unilateral emissions reductions then appear unjustified on cost/benefit grounds. The point here is of course not to endorse the claims of these geoengineering proponents – rather, the point is that alternatives such as geoengineering make the conclusion that we should favor substantial unilateral reductions problematic. For general discussion of geoengineering, see David Keith, *A Case for Climate Engineering*. other citations Caldeira; For a response to an important objection to geoengineering, see Zabel and Budolfson, "Temperature-Related GHG Release and the Evaluation of Costs and Benefits of Solar Radiation Management". Here it should also be noted that thinking that

This Problem of Better Alternatives Than Unilateral Reductions also undermines the force of the other two arguments that Sunstein presents in favor of substantial unilateral reductions. The first of these is that unilateral reductions via policy measures such as regulation and taxes will increase the cost of dirty energy, and thereby spur innovation and accelerate the development of cleaner sources of energy, thereby benefiting the U.S. and the world overall in the long run. However, with the possibility in mind of Better Alternatives Than Unilateral Reductions, the objection to this argument is that unilateral reductions may well be a less cost effective way of securing those clean energy goals than more direct investments in research, development, and technology transfer that do not involve anything like the sort of regulation and taxes that are necessary for 'unilateral emissions reductions'. Of course, it is important to acknowledge that *some* amount of regulation and taxes is presumably part of an optimal policy portfolio for promoting clean energy technology, as well as perhaps for promoting 'net negative cost'[21] emissions reductions that are in the national self-interest of the U.S., and capturing some other co-benefits. However, it is far from clear that the magnitude of these regulations and taxes would amount to more than, say, a $10 carbon tax – which does not rise to the level of *substantial* unilateral emissions reductions, given, again, that here 'substantial emissions reductions' are understood to be reductions of a magnitude implied by a domestic carbon tax equal to the social cost of carbon (again, currently estimated by the EPA at around $40).[22]

Sunstein's third and final argument is that U.S. action and leadership is necessary for the success of an international treaty that coordinates and incentivizes reliable and substantial global emissions reductions, and that the action and leadership that is needed includes unilateral emissions reductions by the U.S.[23] However, even if we grant the assumptions of this argument, including that U.S. **action and leadership** is a necessary condition for any desirable outcome, it does not follow that *the kind* of action and leadership that is needed by the U.S. must involve substantial unilateral emissions reductions. Instead, non-substantial reductions only of a magnitude that are in the domestic self-interest of the U.S.

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substantial unilateral reductions should not be made because of the alternative of geoengineering is perfectly consistent with thinking that very substantial global reductions should be made.

[21] McKinsey.

[22] Another important point is noted by Reihan Salam: "much depends on the nature of domestic carbon regulation. Recent experience suggests that legislators will turn to unite around "green industrial policy" efforts that are likely to channel resources to less-than-promising technologies, like corn ethanol and loan guarantee programs for politically attractive initiatives." ("Has Cass Sunstein Successfully Overcome the 'Sophisticated Objection'? *National Review*, 24 January 2013.)

[23] Sunstein endorses premises (1) and (2) of the Futility Objection, which partly explains the assumptions of his argument here.

might be sufficient to signal to other nations that the U.S. is serious about climate change policy, including global policy, and that it should be taken seriously as a partner for future *reciprocated* emissions reductions.

As another example of an alternative form of action and leadership by the U.S. that does not involve unilateral emissions reductions, consider the proposal by Nobel Laureate Joseph Stiglitz, who suggests that the key to a desirable global response may be an international climate treaty that empowers compliant nations to impose penalties on non-compliant nations, where the penalties are of sufficient magnitude to make it in the interest of nations to comply.[24] If this kind of treaty would be effective, it might be far better for the U.S. to invest its limited political capital in developing and promoting such a treaty – which the U.S. President can do unilaterally even without the support of the U.S. Senate – than to squander political capital on costly unilateral emissions reductions that would be more unpopular politically and would could risk leading to a backlash that would make future productive action much less likely.

As a further development of this idea, consider the possibility of the U.S. President focusing his or her resources on getting a sophisticated version of such a treaty off the ground and signed by *other* nations, and institutionalized as legitimate under WTO rules, with the expected consequence that in the further future the sanctions imposed by other nations would eventually make it in the interest of the U.S. to comply and make **reciprocated** emissions reductions, even if the Senate and other Americans were not disposed to go along with such reductions *prior* to the penalties created under the treaty. (I describe such a strategy in more detail in the appendix.) This example illustrates conceptually the way in which the best form of action and leadership by the U.S. might not involve *unilateral* reductions, but might instead involve leadership without unilateral reductions that has better expected consequences, perhaps via greater *reciprocated* reductions in the future. In addition to providing an interesting possibility for treaty strategy, this provides another example of how the possibility of Better Alternatives Than Unilateral Reductions threatens Sunstein's argument and the suggestion of others that the U.S. 'must lead by substantial unilateral reductions'.

In conclusion, I've examined arguments for the *normative* conclusion that high emitting nations like the U.S. *should* make unilateral greenhouse gas emissions reductions even if many other high-emitting nations are unwilling to make analogous reductions. My main objections can be summarized [as it is on the chart

[24] Stiglitz, "A New Agenda for Global Warming".

on your handout [and below]] by noting that the conclusion – that **the U.S. should make unilateral emissions reductions** – is ambiguous along two dimensions. One ambiguity is that the sense of 'should' could be interpreted in three importantly different ways: it could mean 'should from the perspective of **national self-interest**', or it could mean 'should from a **welfarist** point of view', or finally it could mean 'should from the point of view of **justice**'. Another ambiguity arises from the fact that the magnitude of unilateral emissions could be interpreted as being either **substantial** or **non-substantial**. I've argued that the only sound arguments are for unsurprising conclusions: namely, that nations like the U.S. should make **non-substantial** unilateral reductions of a magnitude that is in their self-interest – perhaps along the lines of the reductions that the U.S. and China have recently proposed. In contrast, I've argued that arguments are unsound or at least highly problematic for the conclusion that nations like the U.S. should make **substantial** unilateral reductions, because at best such arguments depend on problematic empirical claims about the costs and benefits of unilateral reductions vs. alternative courses of action that do not involve unilateral emissions reductions, and at worst involve confusions about the relation between the social cost of carbon and welfare consequences. In connection with climate change, one upshot is that the social cost of carbon is a highly imperfect metric for making domestic climate policy decisions, and further integrated assessment modeling of actual expected co-benefits is necessary to make an adequate case for substantial reductions, contrary to current practice.

The considerations here may also have more general application to other questions of non-ideal theory in the sort of global collective action problems that lie behind many of the most important issues of real-world global justice. Most importantly, when choosing how to invest our limited political capital in the service of justice and human flourishing, it is important to remember that strategic leadership that does not involve unilateral direct action toward those ends might be a much more effective way of bending the universe toward justice than by taking what might, at first glance, seem like a more direct route toward those goals.

Evaluation of arguments for the ambiguous conclusion that:

The U.S. should ___(from what normative perspective?)___ make ___(what magnitude of?)___ unilateral reductions.

		MAGNITUDE OF REDUCTIONS	
		Substantial	Non-Substantial
NORMATIVE PERSPECTIVE	National Self-Interest	Unsound	Sound, but unsurprising
	Welfarism	Empirically problematic given possibility of better alternatives; Can be reasonably rejected by citizens if it assumes cosmopolitanism	Sound, but unsurprising
	Justice	Empirically problematic given possibility of better alternatives	Sound, but unsurprising

Appendix: 'Feasibility Wedges' and a More Sophisticated Version of an Incentives-Based International Treaty

In response to the discussion of Stiglitz's proposal above, many would argue that his proposal is unrealistic, and so does not constitute a *feasible* alternative that is superior on expected cost/benefit grounds, and so does not undermine the plausibility of the conclusion of Sunstein's third argument. This is an important and reasonable response.

However, my own view is that there are a large number of feasibility-enhancing features that in conjunction allow for the creation of a treaty involving the kind of incentive structure described by Stiglitz that is likely enough to succeed to make it a much better bet for humanity than the proposal that the U.S. should 'lead by unilateral emissions reductions' – especially when the political costs of unreciprocated substantial unilateral reductions by the U.S. are taken seriously, including the very realistic possibility that they would lead to a backlash by U.S. citizens that would make any further productive action on climate change politically impossible for at least many decades. In other work I argue that for this reason – and because such a treaty allows for a much better response from the perspective of **justice** than other realistic proposals on offer – the best bet for humanity is a more sophisticated version of this sort of incentive-based treaty.[25]

Again, the argument – admittedly controversial – is that although a sucessful treaty requires U.S. action and leadership, it does not require unilateral emissions reductions by the U.S. – and adding substantial unilateral reductions by the U.S. to such an approach would decrease, rather than increase, both the amount of good and the amount of justice we should expect to realize in return, because it would squander our limited political capital in a way that would be better invested in such a treaty-based response itself.

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[25] Together with their acceptance of (1) and (2), Sunstein, Eric Posner, David Weisbach, Richard Stewart, Jonathan Wiener, John Broome, and others argue that the most ethical global response to climate change that is politically feasible involves reducing emissions to a level that is efficient, while compensating the current citizens of wealthy nations for the cost of making such reductions, thereby ensuring that wealthy nations do not have to make any sacrifices. This combination of a welfare economics approach to policy and hard-headed political realism represents one of the most important current views about what nations should do about climate change, especially among those who endorse a welfare economics approach. See John Broome, Climate Matters, pp. 44-7; Eric Posner and Cass Sunstein, "Climate Change Justice", especially pp. 1569-1570; Eric Posner and David Weisbach, Climate Change Justice, pp. 6, 86, and 143, Richard Stewart and Jonathan Wiener, Reconstructing Climate Policy: Beyond Kyoto, pp. 102-103, Jonathan Wiener, "Incentives and meta-architecture", in Aldy and Stavins (eds.) Architectures for Agreement, pp. 75-76.

More specifically, what I have in mind is something like an international climate treaty that requires signatories to impose emissions taxes within their territory of a magnitude that would be optimal if globally imposed, and that empowers compliant nations to impose tariffs and other penalties on non-compliant nations as retaliation for non-compliance. Given the existence of such a treaty, even if high-emitting nations would be made worse off than business as usual by compliance, they might be made even worse off by non-compliance if there are many signatories to the treaty the collective sanctions of which make the penalties for non-compliance larger than the costs of compliance. The important conceptual point relevant to the argument above is that even though U.S. leadership is needed for such a treaty to succeed, the kind of action leadership that is needed does not involve unilateral emissions reductions.

The idea of such a treaty is to put in place a reliable set of measures that change what it is in the interest of nations to do over time, ultimately making it in the interest of wealthy nations to reduce emissions even beyond the point at which they are made worse off than the business as usual status quo. If such a treaty can be successfully engineered, then even a hard-headed realist view of how nations behave entails that high-emitting nations would *ultimately* comply and reduce emissions (despite the fact that they would not *initially* do so) even though doing so would make them worse off relative to the no-treaty-business-as-usual status quo. The possibility of such a treaty undermines the arguments of Sunstein, Broome, Posner, Weisbach and many others for the repellant conclusion that wealthy nations must be compensated by poor nations in any global accord that is feasible, reliable, and substantial enough to be effective.[26]

Of crucial importance to the likelihood of success of such a treaty are a large number of additional and realistic feasibility-enhancing measures – 'feasibility wedges' – that in conjunction make the prospect of success sufficiently high to make such a response a better bet for humanity than the sort of highly unjust response advocated by others.[27] In what follows, I sketch an example of such a treaty that incorporates such feasibility enhancing features both in its architecture and strategy.

So, imagine a climate treaty architecture that has three somewhat familiar components: first, a cap and trade scheme among signatories to the treaty, where the cap decreases each year along a path that is insensitive to the number of

[26] Ibid.

[27] The metaphor of 'feasibility wedges' is inspired by the notion of stabilization wedges in Stephen Pacala and Robert Socolow, "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies".

signatories to the treaty; second, an undemanding initial cap that ensures that when the treaty initially enters into force, no nation has to make costly emissions reductions in the short run; third, a WTO-permissible right granted to compliant signatory nations to impose a duty on imports from non-compliant nations, where the magnitude of the duty is determined by the emissions differential between compliant nations and non-compliant nations attributable to the differences in emissions prices.[28]

If well-designed, an initial set of nations would initially join such a treaty for a variety of reasons: in many cases, because the treaty would not require emissions reductions early on, but would only require reductions gradually later as the cap decreased and the largest emitters joined the treaty, at which point the cost to early signatories would in some cases tend to be offset by payments from later-joining nations in exchange for emissions permits, and in other cases those later costs would not be relevant to the short-run political calculations of politicians in democratic nations making the initial decision whether to join; in other cases, because it might be to the advantage of some initial signatories to have the power to impose unreciprocated duties on some imports from initial non-signatories; and in other cases, for the sort of complex reasons that have led many regions of the world to independently enact such policies, arguably including a long-run concern for their own citizens and perhaps even the world.

As a result, the initial set of signatories might be comparable to the set of nations that ratified the Kyoto Protocol. From this starting point, the idea is that the sanctions imposed by that initial critical mass of nations would set in motion a chain reaction that would make it in the interest of an increasing number of nations to join over time. Such a chain reaction would be driven by the fact that for each nation that joined the treaty, the cost would increase for each remaining nation that had not joined, because each additional cooperating nation means an additional nation imposing duties on imports from non-cooperating nations. In addition, as more nations joined the treaty and the cap decreased over time, the cap and trade scheme would become increasingly effective, thereby increasing the emissions differential between signatories and non-signatories, thereby increasing the magnitude of each

[28] Because my goal is merely to identify a mechanism by which various emissions reductions architectures could realistically be implemented in as ethical a way as is practically possible given the constraint of feasibility, I wish to remain agnostic on the question of what specific metrics, cost benefit analysis, and architecture ought to be used. Depending on those factors, such a treaty would also include an allocation scheme for emissions permits, any number of which would be consistent with the suggestions in this paper. Such a treaty might also include a mechanism to redistribute to developing nations some of the duties collected, in order to secure the universal compliance of developing nations and to offset the more ethically significant costs of the treaty to developing nations.

individual duty imposed. The idea is that over several decades, more and more nations would gradually join, until eventually the costs of not joining would be so high that even the most recalcitrant nations would ultimately find it in their interest to join rather than continue to hold out.

Of even greater importance, once nations joined such a treaty, it would never be in their interest to pull out, at least if the treaty is successfully designed with the self-enforcing structure imagined above, because given that structure the costs of pulling out always outweigh the costs of staying in after the point at which it is initially in a particular nation's interest to join. This would solve the most serious problem for climate treaties, which is the problem of securing not merely initial ratification of the treaty, but long-run compliance.[29]

Of course, even given the treaty structure and strategy outlined here, the realistic worry remains that strategic retaliatory measures by hostile powerful nations could scuttle the proposal. With that in mind, such a treaty should be introduced under only the most favorable conditions that can be realistically expected in order to further raise its probability of success. Toward that end, additional feasibility wedges such as the following should be identified that represent the most favorable conditions that can realistically be expected – for example:

(1) The treaty should be introduced early in the term of a U.S. President who supports the treaty, enabling him or her to sign the treaty and publicly endorse its permissibility under all international laws and treaties, and to use his or her power and influence to ensure that international court decisions establish as *precedent* that the treaty is permissible. This will *institutionalize* the permissibility of the treaty in a way that cannot be reversed by anything short of dramatic (and hence unlikely) power politics. The U.S. President can do all of this unilaterally even if the U.S. Senate is initially disposed to reject the treaty unanimously, and even if powerful nations such as China oppose the treaty.

[29] For real-world examples and game-theoretic analysis of international environmental treaties that have a structure analogous to the *cascade to universal self-enforcement* structure described here, see Scott Barrett, *Environment and Statecraft*, chapter 9. A treaty is self-enforcing in the relevant sense relative to a set of nations if and only if it is both individually and collectively rational to maintain agreement to the treaty from the point of view of all of those nations. The cascade to self-enforcing structure described here is also consistent with other complementary incentive schemes to encourage compliance. For example, one promising addition would be for duties from all nations to be held by a single global administrator until the end of each year, at which point each nation's proceeds would be disbursed only if that nation complied with the treaty's provisions in the previous year; duties could then be subtracted from the accounts of non-compliant signatory nations based on their degree of non-compliance, with the proceeds distributed to compliant signatories. Other ideas might include a bonus for initial signatories, and many others.

(2) The treaty should be designed so that upon introduction, it is quickly ratified a substantial proportion of developed nations, as well as a substantial proportion of developing nations.

(3) The treaty should be only one part of a policy portfolio that also includes all emissions reduction measures that are in the interest of individual nations to impose, such as technical regulations to realize 'negative cost' emissions reductions, complimentary initiatives such as eliminating funding for new coal power facilities through the World Bank and European Investment Bank,[30] subsidies for research, development, and technology transfer, and perhaps even more controversial measures such as geoengineering via solar radiation management, and investment in and large-scale deployment of carbon capture and storage, nuclear power, etc. This will reduce the magnitude of the costs that must be imposed by the treaty in order for the overall policy portfolio to be effective, thereby reducing incentive for hostile nations to invest in strategic retaliatory measures to scuttle the treaty.

A treaty with the structure described makes it easier to satisfy conditions (1) and (2), because the structure of such a treaty makes it likely that it would actually be effective, which means that nations will recognize that the costs of the treaty are likely to be non-futile, including any political costs to leaders who support the treaty – which are already mitigated by the fact that the treaty shifts the costs of emissions reductions into the future, beyond the short-term time horizon of most political leaders. This increases the likelihood that (1) will be satisfied relative to any particular US President, and increases the likelihood of being satisfied (2) for the various reasons described above. In this context, it is worth noting that even the transparently flawed and ineffective Kyoto Protocol was ratified by an impressive set of nations and signed by U.S. President Bill Clinton. As a result, it is realistic to think that a U.S. President might well be willing to expend the political capital necessary to satisfy condition (1) relative to a treaty far superior to Kyoto, such as the sort of treaty described above involving a *cascade to universal self-enforcement* that would also predictably involve satisfaction of (2).[31]

More importantly, if (1) is satisfied by a supportive U.S. President and (2) is satisfied by an initial coalition that includes roughly the nations that ratified Kyoto, then it is unrealistic to think that other nations hostile to the treaty would have the

[30] For recent developments, see: http://www.reuters.com/article/2013/07/24/eu-coal-finance-idUSL6N0FU32R20130724 and http://www.nytimes.com/2013/10/30/us/us-says-it-wont-back-new-international-coal-fired-power-plants.html.

[31] Here it might help to imagine a U.S. President such as Al Gore.

power and influence to convince international courts to rule against both the U.S .administration and that coalition regarding the permissibility of the treaty under WTO rules, which together with the resulting institutionalized legitimacy of the treaty would substantially reduce the probability that subsequent retaliatory measures could scuttle the treaty.

It is important to add that the more novel package of ideas above can also be combined with other more familiar 'feasibility wedges' such as initial reliance on 'clubs' with mutual interests in particular emissions reductions, and other 'building blocks' that in combination increase the probability of success of a climate treaty.[32]

For current purposes, the important point is that even if it is granted that an international accord is necessary, and even if we grant that U.S. **action and leadership** is a necessary condition for getting such an accord off the ground and spurring other nations to act, it does not follow that the kind of action and leadership that is needed by the U.S. must involve unilateral emission reductions. On the contrary, as I have just suggested the international accords that have the greatest likelihood of successfully incentivizing reliable and substantial global reductions do not require unilateral U.S. emissions reductions, although they do require substantial leadership by the U.S. in other ways, for example in promoting and institutionalizing the basic structure of the treaty.

As noted above, promoting such a treaty arguably allows for a much better response even from the perspective of **justice** than other realistic proposals on offer. And because adding unilateral reductions by the U.S. to such a course of action would decrease, rather than increase, both the amount of good and the amount of justice we should expect to realize in return – because it would squander our limited political capital in a way that would be better invested in such a treaty-based response itself – the prospect of such a treaty-based response ultimately threatens not only welfarist arguments for unilateral reductions, but also justice-based arguments for unilateral reductions.

[END]

[32] See for example David Victor, Global Warming Gridlock, and Richard Stewart, Michael Oppenheimer, and Bryce Rudyk, "A new strategy for global climate protection".