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climate change and the  
environment

## **Can International Regimes be Effective Means to Restrain Carbon Emissions?**

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We stand at an unusual junction in climate policy. New national and international climate policies are widely expected. Congress is likely to enact some national limit on greenhouse-gas emissions in 2009 or 2010; international negotiators are intent on completing work in 2009 on a successor to the Kyoto Protocol, which is due to expire in 2012. Among environmental advocates, there is a sense that action is at hand at last. Momentum toward more ambitious national and international action has never been higher—yet success seems as far from our grasp as ever.

Policymakers have struggled to find ways to curtail greenhouse-gas emissions for twenty years, with little to show for their efforts. The Kyoto Protocol has had a negligible effect on global emissions—its targets were unpalatable for the United States, undemanding for energy-inefficient Russia, and impractical for the many countries that are missing them, while also being far too modest to have a meaningful effect on warming—yet the world seems more intent on replicating Kyoto’s failures than on learning from them. Policymakers are eager to take more aggressive action to cut emissions, but there is as much reason as ever to doubt the prospects for success, given the scale and speed of the reductions that would be needed, according to many scientists, to prevent significant warming.

Despite two decades of debate, the core questions of climate policy remain unresolved: How much, and how quickly, should each nation cut its emissions if we are to prevent significant warming? Is there a fair and feasible way of allocating emissions-reduction obligations among all nations—and enforcing those terms? Can differing national interests be harmonized in a single global system? These critical questions were answered unsatisfactorily in Kyoto, as evidenced by the poor results, and yet there is relatively little evidence of substantially different thinking in the current negotiations for a successor treaty.

Casual observers of the issue might well assume that the basic direction of U.S. and international policy is very clear, given how single-minded the public debate has been. Attention is almost exclusively focused on consideration of various “cap-and-trade” proposals modeled on the Kyoto approach. Under such a system, countries commit to reducing emissions to a certain level over a period of time, and they are given flexibility in how those reductions are achieved.<sup>1</sup> In theory, this is an economically efficient method of achieving emissions reductions; in practice, the Kyoto experience with emissions trading

has been an abysmal failure so far. Its failure has done little to lessen policymakers' enthusiasm for this approach, however, since it allows governments to distribute billions of dollars worth of permits to favored constituencies while concealing from voters the total cost of compliance.

Environmental activists, European governments, and most members of the Democratic majority in Congress would like to extend the Kyoto Protocol in the next commitment period to include additional countries—chiefly, of course, the United States, which declined to ratify it. The United States has consistently favored including more countries in any agreement—in particular, major developing world economies such as China and India—and that is not likely to change in the Obama administration. But whether those countries can be persuaded to participate—and under what terms—we can only imagine; whether the Senate will ratify a treaty that does not include them is even more uncertain.

How far to extend the reach of the treaty, and on what terms, remain highly contentious questions. While some would be satisfied with a treaty that included all major global economies, others argue for a more radical goal: universal—and, ideally, equal—participation in emissions reductions. Climate change is a global problem, the reasoning goes, so each country should contribute equally to solving it. Any country that avoids emissions-reduction obligations could potentially become a haven for energy-intensive industries seeking to circumvent emissions limits. Countries could benefit economically by eschewing emissions limits while enjoying the benefits of the sacrifice of others—the classic “free rider” problem. An equal standard for all countries would, therefore, be the fairest and most effective approach.

In fact, universal participation in any emissions-reduction effort is critical to its success. As William Nordhaus, one of the leading economists studying climate change, has written,

Our modeling results point to the importance of near-universal participation programs to reduce greenhouse gases. Because of the structure of the costs of abatement, with marginal costs being very low for the initial reductions but rising sharply for higher reductions, there are substantial excess costs if the preponderance of sectors and countries are not fully included. We preliminarily estimate that a participation rate of 50 percent, as compared with 100 percent, will impose an abatement-cost penalty of 250 percent. Even with the participation of the top 15 countries and regions, consisting of three-quarters of world emissions, we estimate that the cost penalty is about 70 percent.<sup>2</sup>

While the argument in favor of universal participation in emissions limits has a theoretical logic and a certain emotional appeal, it would be a poor basis

for negotiating a meaningful climate treaty that all nations might actually accept and implement. There is no way to compel participation—or adherence to—such a treaty; each nation must choose to join voluntarily. Countries have widely differing national interests, abilities, and preferences when it comes to the broad range of issues related to climate policy. While climate change is, indeed, a global concern, it does not have equal implications for all countries. Some countries stand to lose much more than others; some countries, such as China and Russia, might even benefit from a warming climate.<sup>3</sup> This differential impact has profound implications for the prospects of any future global agreement: countries that have different material interests at stake are unlikely to agree to make identical efforts to address the problem. There is a wealth of data to illustrate this point, but to pick just one key metric, consider the differences in the amount of economic damage that the countries and regions listed in table 1 expect to suffer, as indicated by expected impact on gross domestic product (GDP).

Just looking at those numbers, it is not hard to conclude that China and Russia are unlikely to accept significant emissions limitations at any time in the foreseeable future, or to bear the cost of mitigation if they do. The United States may be a somewhat different story, due to its political system and current preferences—but only somewhat. It seems implausible that, over the long run, the three countries that stand to lose the least from climate change will be as eager to bear the cost of mitigation as other countries with different national interests. These differences in national interests will inevitably limit the potential for a harmonized international climate treaty. As Harvard Law School professor Cass Sunstein observed,

**Table 1**

**Projected Damages from 2.5°C Warming, as a percentage of GDP**

India	4.93
Africa	3.91
OECD Europe	2.83
High-income OPEC	1.95
Eastern Europe	0.71
Japan	0.50
<b>United States</b>	<b>0.45</b>
<b>China</b>	<b>0.22</b>
<b>Russia</b>	<b>-0.65</b>

Source: Cass R. Sunstein, *The Complex Climate Change Incentives of China and the United States*, Working Paper 07-14 (Washington, D.C.: AEI-Brookings Joint Center for Regulatory Studies, August 2007), 11, table 3.

An agreement that is in the interest of the world as a whole is unlikely to be in the interest of China and the United States, the world's leading contributors. It is increasingly clear that the costs and benefits of emissions reductions are highly variable across nations. On prominent projections, neither China nor the United States is anticipated to be among the principal victims of climate change. The circumstances for an international agreement are distinctly unpromising if the leading emitters do not perceive themselves as likely to gain a great deal from emissions reductions.<sup>4</sup>

Furthermore, there is no way to compel participation—or adherence to—such an agreement; each nation must choose to join voluntarily.<sup>5</sup> Kyoto was essentially toothless in that it had no meaningful enforcement mechanism for countries that missed their targets; it seems unlikely that future treaties will provide for much stronger enforcement—doing so would only make it less likely that developing countries would choose to ratify the treaty.

In the face of these fundamental political obstacles, the challenge for policymakers is to be realistic about crafting policies that will attract some form of participation by the broadest range of nations, recognizing that each will necessarily prefer to respond differently to climate change. Emissions limits are naturally the primary focus of a sound climate policy—but not the only one.

Some nations may want to focus nearly exclusively on one approach—adaptation to the effects of rising temperatures, for instance—while others may choose to combine different elements of these strategies. As it would be difficult, if not impossible, to measure accurately the comparative value of different approaches, each nation would necessarily make different judgments about what policies would be the most cost-effective and appropriate for its circumstances.

Proponents of the one-size-fits-all approach to emissions reductions have no solution to the participation problem, beyond hoping that it will improve in time. Some imagine that a major developing nation such as China might be induced to join an international emissions regime within the next twenty-five years. The possibility cannot be dismissed, but there is little reason to expect it.

Kyoto's exemption of the entire developing world from any emissions obligations is the most conspicuous example of how fundamentally flawed the protocol's structure is. But Kyoto's problems hardly stop there: even among the countries that did choose to ratify it, many are missing their (quite modest) emissions-reduction targets. This experience suggests that nations' willingness to accept targets may well exceed their ability to meet them—which bodes ill for the effectiveness of future agreements.

Even if the United States were to rejoin the Kyoto regime in 2009, and all countries set stricter targets for the next commitment period and (truly wishful thinking) actually met them, the growth in emissions from the developing

world, if left unchecked, would mean that total global emissions will continue to rise for decades to come. China has at last overtaken the United States as the world's leading emitter of greenhouse gases—a symbolic turning point that policymakers cannot ignore—and is on pace to increase its emissions by 13 percent a year in this decade, far more than had been expected.<sup>6</sup> Given the persistence of greenhouse gases in the atmosphere (carbon dioxide can last for at least century, if not more), the continued rise in emissions that is expected in the coming decades will commit the planet to a century or more of warming. Americans are concerned about “the China problem”—how to make a treaty work without China's participation; in Europe, they talk of “the American problem.” The American problem may well resolve itself, at least in some form, in the next few years—but the China problem will not.

## THE FUTILITY OF EQUITY ARGUMENTS

Faced with the participation problem, many advocates turn to exhortations, often framed in terms of moral obligations rooted in a sense of fairness. These arguments are primarily directed at the United States, the most conspicuous holdout from the Kyoto regime. But their lasting strength and effectiveness will depend more upon their applicability to the China problem—and there they seem weakest.

Even though China has taken over as the world's leading emitter of greenhouse gases, the United States, we are often reminded, long held that position, and remains by far the leading emitter on a per-capita basis. It is easy—and politically popular in the international community—to argue that the United States has a unique obligation to lead the effort in reducing emissions. Former UN secretary-general Kofi Annan, for instance, has called for “climate justice”—that is, requiring reductions from the countries most responsible for past emissions, rather than those whose emissions are growing fastest now. “We must recognize,” says Annan, “that the polluter must pay, and not the poor and vulnerable.”<sup>7</sup>

Certainly this was the logic, if not the effect, of the Kyoto Protocol. And in the near future, it does seem likely that Americans will, indeed, undertake more aggressive measures to reduce their emissions; federal limits of some sort seem likely. But if “climate justice” means repeating Kyoto's errors in emissions allocations, particularly its exemption of the developing world, then we can be certain that global emissions will continue to rise. And if climate change is truly a moral issue, the obligation to act against it must fall on all shoulders, regardless of economic circumstances, since inclusion is the key to effectiveness.

Some believe that U.S. leadership will inspire China, India, and other major developing countries to accept emissions limits, as well. If we give any credence

to the historical record and the current position of those governments, however, we must conclude that, if anything, unilateral acceptance of emissions limits by the United States is just as likely to reinforce China and India's incentives to reject limits of their own. The more inclusive and stringent the Kyoto regime becomes, the stronger the incentive for energy-intensive industries to relocate to developing nations that have no emissions limits—and, consequently, the higher the cost to those nations of joining the Kyoto regime. Further financial incentives to refuse emissions caps are provided by Kyoto's Clean Development Mechanism (CDM), which generates emissions-reduction credits by funding projects in the developing world.<sup>8</sup> Unfortunately, the CDM actually creates perverse incentives for developing countries: the less initiative a country takes to cut its own emissions voluntarily, the more it can earn from the CDM.

Advocates argue that, in time, rising standards of living in the developing world and growing evidence of the effects of climate change will persuade at least the major developing economies to accept emissions caps. One can never know what the future will bring, but it seems unlikely that such a transformation will occur quickly. But the possibility itself does raise again the question: Even if all nations agree that action of some sort is desirable, what principles can guide us to a fair and practical international agreement?

Equity, while naturally appealing to a simplistic sense of fairness, seems particularly ill-suited to the multifaceted challenges of global climate policy. There are both practical and conceptual problems with using equity—or any of the common alternatives, such as Annan's fairness argument—as a guide to allocating international obligations for climate policy.

The simplest application of the equity argument, for instance, is the idea that all nations should cut their emissions of greenhouse gases by equal amounts. Poorer and more populous countries, however, argue that emissions should be equalized on a per-capita basis. Surely an Indian is entitled to emit as many greenhouse gases as an American? The industrialized world is largely responsible for the man-made greenhouse gases currently in the atmosphere; shouldn't it be responsible for solving the problem?

There is certainly a logic in these countries' perspective—but as a practical matter, if we accept that claim, we accept a future of virtually unlimited global emissions. Until we invent technologies that can remove greenhouse gases from the atmosphere, there is no way to undo historical emissions; we can only seek to prevent future emissions, the majority of which will come from developing countries such as India.<sup>9</sup> There is no end to the fairness arguments, but as a practical matter they are irrelevant: it will be impossible to stabilize global atmospheric concentrations of greenhouse gases without significant emissions limits in the developing world.

One recent study projects that, absent an agreement to limit its emissions, China's greenhouse-gas emissions in 2030 will be equal to the entire world's current emissions.<sup>10</sup> This staggering fact underscores the fundamental reality: without a means of controlling emissions from China, India, and other major developing economies, efforts to halt warming through emissions reductions are doomed to failure. The Kyoto Protocol's exemption of China and other developing countries from any emissions-reduction obligations may well prove to be the single most damaging precedent in climate policy; the prospects for reversing it in future negotiations seem poor.

On the other side of the fairness argument, some (most notably to date, the Bush administration) have argued that it would be both unfair and unrealistic not to recognize differences in the size of national economies when calculating environmental obligations. Yes, the United States has been the leading global emitter—but it is also the largest economy in the world. In fact, not surprisingly, its share of the global economy corresponds precisely to its share of global emissions. Separating those trend lines is the goal of climate policies, but progress has been slow.

In February 2002, President Bush proposed reducing the greenhouse-gas “intensity” of the U.S. economy—that is, the amount of emissions per unit of GDP.<sup>11</sup> This metric has a logical appeal as well—it recognizes the fundamental fact that economic activity inevitably generates greenhouse-gas emissions, and that, consequently, emissions targets should reflect differences in the size and nature of each nation's economy. But, as with the per-capita approach, this metric can also be used to justify continued emissions, rather than curtailing them. Developing nations may object that this concept constitutes “carbon colonialism,” reinforcing existing differences in global economic status through an economically controlling emissions regime.

In sum, accepting existing differences in economic growth and associated emissions levels would disadvantage less-developed countries, discouraging them from accepting emissions limits; allocating emissions obligations on an equal per-capita basis would sanction decades of additional growth in the developing world's—and, hence, global—emissions.

The obstacles to a “fair” allocation of emissions burdens do not end there, however. Some countries (Japan, for example) have highly energy-efficient economies, with far fewer opportunities for cost-effective emissions reductions. Should Japan be punished for its progress by asking it to cut its emissions as much as a country with an aging, highly inefficient industrial infrastructure?

There are nearly endless variations on this theme. The United States has enjoyed stronger economic and population growth than other countries. Shouldn't we expect its emissions to grow? France happens to have the benefit

of a strong nuclear power sector; Britain shifted away from coal in favor of natural gas for reasons unrelated to climate change. Should those countries be given credit for those facts—or should they be expected to expend an equivalent effort at reducing emissions in other areas of their economies?

On the other side of the coin, Russia, of course, only ratified the Kyoto Protocol because it was bribed with generous credits based on its Soviet-era emissions levels. Russia's participation in Kyoto, in other words, was purchased at the price of granting it the right to emissions far in excess of its current level. The leading proposals to entice China into a new global agreement tend to replicate that example, although they obviously sacrifice effectiveness for the sake of achieving nominal participation. But without such favorable terms, countries such as China and Russia are unlikely to accept any emissions limits—and, from their perspective, why should they? Clearly, fairness is in the eye of the beholder when it comes to these issues.

The ultimate futility of the equity argument becomes even clearer when one considers the impossibility of accurately measuring the merit of each nation's investments in climate protection. Even if nations were simply to agree that each should make an equivalent effort at combating warming, a meaningful measure of a nation's effort would have to be far more complex than merely totaling annual emissions levels. It is a grave mistake to treat climate change as a single problem with a single solution; in fact, it is a much more complex and multifaceted group of issues requiring a much more complex policy response.

### **DIFFERING INTERESTS, ABILITIES, AND APPROACHES TO CLIMATE POLICY**

Agreeing on what level of comparable effort might be a fair distribution of burdens among nations—and finding a way to measure that effort—is hard enough, but the task becomes impossible if there is also no way to measure progress objectively in the short term. Different nations would be wise to choose a variety of different climate policies, depending on their interests and abilities—some emphasizing adaptation to warming more than mitigation, and some vice versa. Some countries might favor aggressive action to reduce emissions, while others might prefer investing in research efforts that could have an equal or greater effect in the long run. Each nation would have countless different decisions to make in crafting its policies. Determining what mix of actions is “fair” would involve an endless array of subjective, uncertain calculations—and what country would accept the judgment of others in that assessment?

Some countries have greater opportunities than others to reduce their emissions at relatively modest cost. Others may have different visions for achieving

the same goals. How should we value differing national investments in emissions reductions, scientific and technological research and development, and adaptation measures to protect public health? Many countries, particularly in the developing world, would find that it makes most sense to invest their resources in programs to protect their citizens from the effects of climate change. Foremost on that agenda for many nations would be economic growth, which would raise living standards and protect citizens from the effects of climate change—while necessarily contributing to ever-rising global emissions.

Even within the industrialized world, different countries, depending on their interests and abilities, would rationally prefer different approaches to climate change that might be equally valid. If a wealthy, innovative country, for instance, were to invest heavily in an intensive research-and-development program for climate-related technologies that would make massive emissions reductions cost-effective in the long run—while eschewing ambitious emissions reductions in the short term—the long-term benefits of that approach could be far greater than another country's comparably costly effort to cut emissions as quickly as possible.<sup>12</sup> But there is no way to predict reliably which of these efforts would be more effective.

Since the key question is not necessarily how *quickly* we reduce global emissions but rather how *much* they can be reduced over the course of the remainder of this century, nations could reasonably choose different emissions-control pathways that might ultimately have equivalent effect—or might not, if unexpected obstacles should arise along one of the chosen routes. Measuring progress toward a hundred-year target in annual increments can easily give a distorted picture—but that is how political institutions tend to see these questions.

Ultimately, each country will have to make its own judgments. Purists may call for universal participation in an emissions-control regime, but there is no way around the fact that each country has different interests, abilities, and agendas. When it comes to designing an architecture and agenda for a global climate policy, it is not clear that uniformity or equality should be primary concerns. Each country should seek to make realistic commitments to a sustainable climate policy that is appropriate for its national interests and abilities.

## **THE QUEST FOR A COMPREHENSIVE INTERNATIONAL CLIMATE POLICY**

The global population is expected to grow by 2.5 billion by mid-century.<sup>13</sup> Energy use is expected to increase by 57 percent by 2030. Within countries outside the Organization for Economic Cooperation and Development (OECD),

that figure is 95 percent.<sup>14</sup> Despite two decades of effort to constrain them, global emissions continue to rise inexorably, and fundamental differences in the ability and motivation of countries to reduce emissions continue to undermine the level of consensus needed for effective global action.

Given those facts, it is far from clear that it is even possible to craft a truly effective international climate treaty, so vast is the scale of economic, social, and technological transformation that would be necessary, and so fundamental the political and economic obstacles to success. If there is any hope of making such a treaty broadly attractive to a wide range of countries, it cannot be rigidly committed to universal and equal targets. Widely varying national circumstances should determine the nature of each nation's climate policies. It would be madness, for instance, for Bangladesh to focus its resources on emissions reductions—its environmental conditions dictate that adaptation to warming is the only rational priority for its government. Even if it were possible to force the world into a uniform emissions-reduction scheme, therefore, it is far from clear that it would be desirable.

The Kyoto Protocol was intended to be the first step in constructing a single, harmonized emissions-limitation regime. Although it was understood that its initial scope would be limited, advocates imagined that it could be slowly expanded and refined until it became complete. But since this goal remains elusive, perhaps a better approach would be to stop trying so hard. A growing number of scholars recognize that a single, harmonized approach to climate policy might not be preferable, even if it were feasible. William Pizer of Resources for the Future has noted three lessons we can take from our experience with Kyoto and other national efforts at emissions reductions:

First, a binding international agreement is neither necessary nor sufficient for domestic actions. ... Second, whatever action a country takes, the form of that action is likely to be dictated by domestic features and forces. ... Third, even without formal mechanisms to equalize marginal costs across countries—e.g., international trading or a single, agreed upon tax rate—various forces seem to keep those costs in line.<sup>15</sup>

Pizer suggests that we set aside the quest for a single, all-encompassing structure for an international emissions-limitation regime and focus instead on encouraging countries to take action in whatever form seems most appropriate and most effective, given their national circumstances. "We need to recognize," he explains,

that domestic circumstances and opportunities [for action on climate] differ; that, at least right now, at the beginning of a perhaps century-long global effort to address climate change, binding emission limits, prices, or

standards are unlikely to be helpful; and that formal mechanisms to equalize marginal costs (at this initial phase) are less important for efficiency than suggested in the literature. Instead, we should encourage countries to make some commitment to mandatory action, and focus our energy on a clear commitment to evaluate what actually happens.<sup>16</sup>

Gwyn Prins and Steve Rayner, two British scholars of climate policy, have made similar recommendations, offering seven key principles by which a new approach to climate policy might be guided. The first of these principles is to use a “silver buckshot” approach—that is, to adopt “a wide variety of climate policies—silver buckshot—and non-climate policies with climate effects. Each would have the potential to tackle some part of the overall problem, although it would not be clear which would be the most successful.”<sup>17</sup>

Prins and Rayner suggest abandoning the pursuit of a universal treaty in favor of a focus on the major emitters, with more emphasis on state and regional initiatives, more research and development, and greater investment in adaptation. Freed from the strictures of an international treaty, nations could learn from their experiences and adjust their policies accordingly. “Sometimes the best line of approach,” they conclude, “is not head-on, if one seeks long-lasting impact.”

In an ideal world, a single, unified emissions-reduction regime might be the most effective and efficient approach to the climate problem—but given the fundamental political and economic factors at work in our less-than-ideal world today, a less coordinated and more creative approach may be our only hope of success. There is little prospect for successfully cutting global emissions dramatically in the near term, so long-term success must depend upon our ability to learn from our successes and failures and respond to changing conditions over the course of the century. Flexibility and innovation, not equity and arbitrary standards, should be our watchwords in designing national and international climate policies.