VIEWPOINTS

Three Pillars of Post-2012 International Climate Policy

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1. INTRODUCTION

The nations of the world continue to negotiate the post-2012 (or post-Kyoto) climate regime through the United Nations Framework Convention on Climate Change (UNFCCC), which includes the Fifteenth Conference of the Parties (COP-15), scheduled for Copenhagen, Denmark, in December 2009. The seventeen countries with the greatest greenhouse gas (GHG) emissions have also been holding a series of meetings under the auspices of the Major Economies Forum, and a number of nations have been meeting in various other multilateral and bilateral venues. In all of these processes, the major goal is to develop international cooperation to address climate change when the first commitment period of the Kyoto Protocol expires at the end of 2012.

The Kyoto Protocol, the first significant multinational attempt to curb the greenhouse gas emissions that are changing the global climate, came into force in February 2005 and began to bind for ratified countries in 2008. The Protocol's strengths and weaknesses provide lessons for the design of future international climate policy agreements.

On the positive side, the Kyoto Protocol includes several provisions for market-based approaches to improve the cost-effectiveness of the global climate regime. In addition, it provides flexibility for nations to meet their emissions targets in any way they want. The Kyoto Protocol also has at least the appearance of fairness in that it focuses on the wealthiest countries and those responsible for the majority of the current atmospheric stock of anthropogenic greenhouse gases. Finally, the fact that the Protocol was signed by more than 180 countries and ratified by a sufficient number of industrialized countries for it to come into force speaks to the political viability of the agreement in terms of participation, if not compliance.

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The Kyoto Protocol also has some weaknesses that can provide valuable lessons for the path forward. First, some of the world's leading greenhouse gas emitters are not constrained by the Protocol; this includes the United States as well as some of the largest, fastest-growing developing economies. Second, since a relatively small number of countries have agreed to take action under Kyoto, the production of carbon-intensive goods and services (and emissions) may shift from participating nations to non-participating nations — a phenomenon known as "emissions leakage." Third, the Protocol's provision for international emissions trading is unlikely to be effective, if it is utilized at all, because trading would need to be among national governments, not private firms. And the Protocol's clean development mechanism (CDM), an emissions-reduction-credit system, is dogged by the question of the "additionality" of generated offsets — are the emissions credits generated by projects really emissions "savings", or would emission reductions have been achieved even without the projects? Fourth, the Kyoto Protocol's five-year time horizon (2008 to 2012) represents a short-term approach for what is fundamentally a long-term problem. Finally, the Protocol may not provide sufficient compliance incentives; some countries that took on emissions reduction targets for this period may not meet them.

The Kyoto Protocol imposes relatively high costs and generates minor short-term benefits while failing to provide a real solution. It came into force without U.S. participation or meaningful participation by developing countries; its effects on climate change will be trivial; but the economic and scientific consensus points to the need for a credible international approach. What can be done? We offer a suggestion of a scientifically sound, economically rational, and politically pragmatic way forward.

2. THREE PILLARS OF POST-2012 GLOBAL CLIMATE POLICY

Our proposal for a post-2012 international global climate policy agreement contains three essential elements: meaningful involvement by key industrialized and developing nations; an emphasis on an extended time path of targets; and inclusion of market-based policy instruments. This architecture is consistent with fundamental aspects of the science, economics, and politics of global climate change.

2.1 Expanding Participation

The vast majority of the accumulated stock of anthropogenic CO_2 in the earth's atmosphere was emitted by sources in industrialized countries. From the perspective of distributional equity, it can certainly be argued that industrialized countries should take serious actions to reduce their emissions *before* developing countries are asked to contribute to such efforts. Thus, ethics may favor a relatively narrow coalition of action, like that embodied in the Kyoto Protocol. However, a broad set of participants must be engaged for four major reasons.

1. The share of global emissions attributable to developing countries is significant and growing rapidly. China surpassed the United States as the world's largest emitter of CO_2 in 2006. More broadly, developing countries are likely to account for more than half of global emissions within the next decade. Even if today's industrialized countries were to reduce their CO_2 emissions to zero by 2020 to 2030, it would still be physically impossible for the world to achieve the frequently discussed climate target of stabilizing atmospheric CO_2 concentrations at or below 450 parts per million (ppm).

2. Developing countries provide the greatest opportunities for relatively low-cost emissions reductions. Focusing emissions-reduction activities exclusively in the developed world is unnecessarily costly. Estimates suggest that achieving the Kyoto Protocol's emissions targets with a broader scope of action — including major developing countries — could dramatically reduce the total costs of achieving these targets. The will also be true post-2012.

3. The United States and several other industrialized countries may not commit to significant emissions reductions without developing country participation. In the months leading up to Kyoto, the U.S. Senate voted 95-0 in support of the Byrd-Hagel resolution, stating that the United States should not approve any agreement in Kyoto that did not impose binding emission reduction targets on major developing countries, as well as industrialized nations. More recently, the G8 countries declared after a July 2008 meeting in Hokkaido, Japan, that "all major economies" should contribute to a target of reducing global emissions.

4. Including developing countries in a post-2012 global climate policy architecture will ensure the environmental effectiveness of emissions reductions by participating countries. If developing countries are not included in an agreement, estimates suggest that up to one-third of carbon emissions reductions may "leak" into these economies. High leakage rates would reduce environmental gains from emissions reductions by participating countries and push developing nations onto more carbon-intensive growth paths, increasing their cost of joining the coalition later.

The large, rapidly-growing developing countries must be involved in any meaningful post-2012 international climate policy architecture for these four reasons. However, on equity grounds, it is unreasonable to expect developing nations to incur significant emissions-reduction costs in the short term, because it would slow their economic development. How can key developing countries participate in an international effort to reduce greenhouse gas emissions without incurring the brunt of the consequent costs?

One key element of an architecture that accomplishes this would be a trigger mechanism, imposing binding commitments only when per capita income, emissions per capita, or some other measure of development has reached a predetermined level. Continuous "growth targets" would become more stringent as countries become more wealthy, a natural extension of the progressive target allocation in the Kyoto Protocol. For each 10 percent increase in a country's per capita gross domestic product (GDP), the Kyoto targets — on average — are about 1.4 percent more stringent. Though this was not a formal goal of the Kyoto Protocol, a post-2012 international climate architecture could incorporate specific formulas *ex ante* for increasing developing country participation over time.

In the short term, indexed targets for developing countries could be set at business-as-usual (BAU) emissions levels, but they would become more stringent over time as countries became wealthier. Keeping even poor countries at or near BAU emissions is an important goal, since it prevents the possibility of significant carbon leakage. If emissions targets at BAU for the short- to medium-run were combined with an international emission trading program (discussed below), this could provide a direct subsidy for developing-country participation. Developing countries could fully participate without incurring prohibitive costs (or even any costs in the short term). Cost-effectiveness and distributional equity could both be addressed.

2.2 An Extended Time Path of Targets

Global climate change is a long-term problem. Greenhouse gases remain in the atmosphere for decades to centuries, and significant technological change will be required to bring down the costs of reducing carbon emissions. By contrast, the Kyoto Protocol sets short-term targets, an average 5 percent reduction from 1990 levels by 2008–2012. This modest reduction translates into a severe 25–30 percent cut for the United States from its BAU emissions path, because the U.S. economy grew at an exceptionally rapid rate during the 1990s.

Thus, the Protocol's targets do little about the problem, but are unreasonable for countries that enjoyed significant economic growth after 1990. Two elements can ameliorate this problem: firm but moderate targets in the short term to avoid rendering large parts of the capital stock prematurely obsolete, and flexible but more stringent targets for the long term to motivate technological change, which is needed to bring costs down over time. Specifically, emissions targets ought to start out at BAU levels, and then gradually depart from BAU levels. Globally, intertemporal emissions targets should not be monotonically increasing, but should reach a maximum and then begin to decrease — eventually becoming substantially more severe than the constraints implied by the Kyoto Protocol.

Some of the considerable uncertainty over future growth, technological change, and the science of climate change and its effects will be resolved over time. Thus, long-term targets must retain some flexibility. For example, they must incorporate constraints representing the economic reality that no country is likely to abide by an unenforceable international agreement that causes great economic disruption in any particular year, or set of years.

The pattern we suggest is consistent with estimates of the least-cost time path of emissions for achieving long-term, greenhouse-gas concentration targets. Such a time path of long-term targets, put in place now, would be consistent with what is often denigrated as "politics as usual." Politicians are frequently condemned for the fact that in representative democracies there are strong incentives to place costs on future, not current voters and, if possible, future generations. It is typically the politically pragmatic strategy. In the case of global climate policy, it can also be the scientifically correct and economically rational approach.

2.3 Market-Based Policy Instruments

The final component of the three-part policy architecture we propose is necessary to achieve global cost-effectiveness and thereby render the overall architecture politically achievable: working through the market rather than against it. To keep costs down in the short term and bring them down even lower in the long term through technological change, market-based instruments must be embraced as the chief means of reducing greenhouse gas emissions.

On a domestic level in some countries, systems of tradable permits — otherwise known as "cap-and-trade" — may be used to achieve national targets. Under cap-and-trade, sources with low control costs have an incentive to take on added reductions, so that they can sell their excess permits to sources that face relatively high control costs and would hence wish to reduce their control efforts. For some countries, systems of domestic carbon taxes may be more attractive than cap-and-trade. Rather than imposing a cap on the quantity of pollution and allowing regulated firms to trade emissions permits to establish a market price for pollution, a tax imposes a specific price on pollution and allows firms to decide how much to pollute in response. An ordinary cap-and-trade system can be accompanied by a government promise to sell additional permits at a stated price. This creates a price (and thereby cost) ceiling and has hence been labeled a safety-valve system. Likewise, a price floor can be created by a government promise to purchase allowances from the market at a given price. The combination of the two approaches — known as a "price collar" — may have particular merit in the climate context.

Among these alternative market-based policy instruments, cap-and-trade is emerging as the preferred approach among industrialized countries. At the same time, the emission-reduction credit system created under the Kyoto Protocol, the CDM, enjoys solid developing country support.

An undisputed attraction — in theory — of an international trading approach is that the equilibrium allocation of permits, the market-determined permit price, and the aggregate costs of abatement are independent of the initial allocation of permits among countries, under certain conditions. However, the initial allocation can be highly significant in distributional terms, implying possibly massive international wealth transfers. Some analysts have highlighted this as a major objection to an international carbon trading regime, but it is essentially because of this feature that a permit system can be used to address cost-effectiveness *and* distributional equity.

If an international trading system is used, it must be designed to facilitate integration with domestic policies that nations use to achieve their respective targets. In the extreme, if all countries use domestic tradable permit systems to meet their national targets, then an international system can — in theory — be perfectly cost-effective. But if some countries use non-trading approaches, such as technology standards or performance standards — which seems likely — costs may not be minimized. Thus, individual nations' choices of domestic policy instruments to meet their targets can substantially limit the cost-saving potential of an international trading program. An emerging answer may be the linkage of independent domestic and regional cap-and-trade systems.

Several domestic and regional cap-and-trade systems have been established. The Kyoto Protocol establishes a bubble for the European Union (EU). It sets a cap on CO_2 emissions for the European Union as a whole, allocated by the EU to it member states. Under this cap, the European Union Emission Trading Scheme (EU ETS) was established in 2005 and, after a pilot phase, entered its more meaningful Kyoto phase in January 2008. The EU ETS is now the world's largest emissions trading system, accounting for nearly one-half of EU CO_2 emissions. Some see the EU ETS as a prototype for a post-2012 international global climate regime, noting that the 30 states involved constitute an increasingly diverse set of sovereign countries.

In June 2009, the U.S. federal government took its most significant step to date toward putting in place a national cap-and-trade policy to reduce CO_2 emissions with the passage in the House of Representatives of the American Clean Energy and Security Act. A number of other major industrialized countries are instituting, planning, or considering national cap-and-trade systems to reduce CO_2 emissions, including Australia, Canada, Japan, and New Zealand.

Linkage of these cap-and-trade systems may constitute a significant element of a future international climate policy architecture; allowances (permits) from one system would be recognized for use in meeting compliance requirements in another. The potential benefits of such linking of domestic systems include cost savings from increasing the scope of the market, greater market liquidity, reduced price volatility, lessened market power, and reduced carbon leakage.

International linkage could occur in several ways. Domestic cap-and-trade programs could be linked directly. Allowance prices would converge with direct bilateral linkage, so long as there were no constraints on inter-system trades. But direct linkage of cap-and-trade systems will lead to the automatic transmission of cost-containment elements — banking, borrowing, safety valves, and price collars — from one system to the other. This raises concerns for some countries because of the possible loss of control of their domestic systems and raises the possibility that systems would need to be harmonized in advance of linkage.

This necessity for prior harmonization can be eliminated through the substitution of indirect links for direct ones. If several cap-and-trade systems link with a common emission-reduction credit system, then all of the cap-and-trade systems will be linked indirectly, achieving the benefits of direct linkage, but without the unintentional transmission of cost-containment mechanisms from one system to another. In theory, prices in two cap-and-trade systems which are indirectly linked through a credit system will converge, as credits flow to the system with the highest price. This is, in essence, what seems to be evolving in the world. The CDM's certified emissions reductions (CERs) can be used to meet emissions commitments within the EU ETS, and other systems appear very likely to accept CERs as well. On the down side, linking credit systems with cap-and-trade systems passes along the worry of incomplete additionality.

The experience of the EU ETS, the strong U.S. preference for trading, and support voiced by some key developing countries represent important political arguments for this element of a future international climate policy architecture. International permit trading — not among countries, *per se*, but among firms within and across countries — thus remains a promising approach to achieving global greenhouse gas targets, despite the challenges that exist.

CONCLUSION

The three-part global climate policy architecture we have proposed builds upon the UN Framework Convention on Climate Change and could potentially serve as a successor to the Kyoto Protocol. For such an approach to work, key nations have to be involved, including major developing countries through the use of economic trigger mechanisms such as growth targets. In addition, cost-effective time paths of targets are required: firm, but moderate in the short term, and in the long term, much more stringent and flexible. Finally, market-based policy instruments ought to be part of the package, whether emissions trading, carbon taxes, or hybrids of the two.

This overall approach can be made to be scientifically sound, economically rational, and perhaps politically pragmatic. There is no denying that the challenges facing adoption and successful implementation of this climate policy architecture are significant, but they need not be insurmountable, and they are not any greater than the challenges facing other approaches to the threat of global climate change.

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The goal of the Harvard Project on International Climate Agreements is to help identify and advance scientifically sound, economically rational, and politically pragmatic public policy options for addressing global climate change. Drawing upon leading thinkers in Australia, China, Europe, India, Japan, the United States, and other countries, the Project conducts research on policy architecture and key design elements of a post-2012 international climate policy regime. The Harvard Project also provides insight and advice regarding countries' domestic climate policies, especially as these policies relate to the prospects for meaningful international action. The Project is directed by Robert N. Stavins, Albert Pratt Professor of Business and Government at the Harvard Kennedy School. Major funding for the Harvard Project on International Climate Agreements is provided by a generous grant from the Climate Change Initiative of the Doris Duke Charitable Foundation.

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