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Climate Change after Kyoto: A Blueprint for a Realistic Approach

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SPRING 2002 — In 1992, the United Nations Earth Summit in Rio de Janeiro produced a landmark treaty on climate change that undertook to stabilize greenhouse gas concentrations in the atmosphere. The agreement, signed and ratified by more than 186 countries, including the United States, spawned a decade of subsequent climate negotiations, but has had virtually no effect on greenhouse gas emissions. It has not even produced a detectable slowing in the rate of emissions growth.

The treaty's implementing protocol, the 1997 Kyoto agreement, has not been ratified by any major emitter of heat-trapping gases, has been rejected by the United States, and has been spurned by developing countries. At the same time, the relatively stringent emissions targets negotiated in Kyoto have been so diluted in subsequent negotiations that it would likely take another decade for the protocol to begin to deal with the problem of climate change.

The primary cause of this failure has been the inability of the treaty negotiators to cope with the uncertainty that surrounds every facet of climate change—how much global warming will take place and when, how much damage it will cause, how costly addressing the damage will be.

The prevailing uncertainty about global warming is no argument for doing nothing about it. Clearly human activity is raising global concentrations of carbon dioxide. Virtually no one seriously suggests that mankind can continue to emit increasing amounts of carbon dioxide into the atmosphere without any adverse consequences. But arguing that climate change is such an overwhelming problem that it must be stopped no matter what the cost is also untenable. A climate policy that fails to take cost into consideration will ultimately be rejected by almost all governments.

In what follows we outline an approach to climate change that differs fundamentally from that of the Kyoto Protocol yet is consistent with the 1992 UN treaty. It can be developed from current negotiations and can even be implemented by individual countries before a final international agreement is reached.

What's Wrong with Kyoto

The fundamental principle on which the Kyoto Protocol is based—setting "targets and timetables" for reducing greenhouse gas emissions—is both economically flawed and politically unrealistic. To ratify the protocol, a developed country must be willing to agree to reduce its emissions to a specified level—typically about 5 percent below the country's emissions in 1990—by 2008 to 2012 regardless of cost. Because costs could be huge, most developed countries will never ratify the treaty or will insist, as a precondition, that their targets be diluted through an accounting adjustment that allows credit for activities that absorb carbon (called sinks). Countries that do ratify are unlikely to comply if the constraints become seriously binding. Developing nations, which will become the world's largest emitters in coming decades,

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have even less incentive to sign on.

The issue of costs is crucial. The array of uncertainties associated with climate change makes it impossible to tell whether the benefits of the treaty are worth its costs. Nor is there any evidence that the targets set by the protocol are the optimal levels of greenhouse gas emissions, either for an individual country or for the world as a whole. If anything, cost-benefit calculations based on studies to date tend to suggest that the costs exceed the benefits, at least in developed countries.

Kyoto's greatest weakness, however, is not the lack of clear cost-benefit justification. After all, governments often face uncertainty when evaluating potential policies. Because the damages caused by climate change could be very large, a prudent legislature might want to adopt a climate policy to hedge its bets as long as it could keep the policy's costs within bounds. But Kyoto's "targets and timetables" design makes that impossible. Governments that adopt the protocol risk taking on a disastrously expensive commitment—and surrender part of their sovereignty in the process.

The Kyoto agreement also fails to give governments any incentive to police it and lacks credible compliance measures. Monitoring polluters is expensive, and punishing violators would impose costs on domestic residents in exchange for benefits that would go largely to foreigners. Governments would be strongly tempted to look the other way when firms exceed their emissions permits. Negotiators have tried to devise a strong international mechanism to monitor compliance and penalize violations, but so far have produced only a paper tiger: the protocol's compliance mechanism is not a credible deterrent for anything beyond very minor violations.

Nor has Kyoto found a way to include significant participation by developing countries. Because these countries are responsible for a relatively small share of historical greenhouse gas emissions, they are especially reluctant to incur large costs and give up their sovereignty in a climate change agreement. The protocol does provide a complicated mechanism that would allow developed countries to earn credits for reducing the rate of emissions growth in developing countries. However, it would have little effect overall because developing countries are expressly exempted from Kyoto's emissions targets. They would not be required to limit their emissions unless they volunteered—at some point in the future—to accept binding emissions targets. But the protocol provides little incentive for them to do so.

A Realistic Alternative to Kyoto

We propose a pragmatic climate change policy with aims more modest than Kyoto's. Rather than trying to cap emissions at any cost through targets and timetables, we would abate emissions where possible at low cost, using reasonable and prudent measures to reduce the risk of climate change.

In our system, as in the Kyoto Protocol, each nation would be given a fixed supply of long-term emission permits. Unlike the protocol, however, we would allow each government to supplement the supply of permits, when necessary, by selling additional short-term permits at an agreed international price. All long-term permits would be distributed by a country's government to energy suppliers, businesses, even individuals if deemed appropriate. Each long-term permit would allow the holder to emit one ton of carbon each year. The long-term permits would be given away or auctioned or distributed by the government in any way it sees fit. Each country's supply of long-term permits would be negotiated internationally, but one possibility would be an amount equal to 95 percent of the country's 1990 emissions (the basis of Kyoto's targets). That approach would "grandfather" energy producers at 95 percent of their 1990 emissions level, easing for them the coming adjustment to a world with lower greenhouse gas emissions. Once distributed, the long-term permits could be bought or sold among firms or even bought and retired by environmental groups. No additional long-term permits could be distributed, but the government could buy back permits in future years if new evidence reveals a necessity to cut emissions. The long-term permits could be perpetual, or could be issued with expiration dates—10, 20, and 50 years, for example—to give governments more flexibility. In the latter case, each category would have its own trading market, and prices for each would emerge as they do for other asset markets.

Our system encourages energy producers to keep emissions steady or, even better, to cut them. Firms that can cut emissions cheaply will do so and then sell unneeded long-term permits to those whose emissions are increasing.

If a country's emissions increase above the level allowed by the supply of long-term permits, its government will be allowed to sell supplementary annual permits for a fixed world fee, say \$10 (U.S., 1990 dollars). At the end of each calendar year, energy producers would be required to reconcile their production of emissions with their holdings of permits. Any shortfall would require a purchase of annual permits from the government at the fixed world price.

The price of long-term permits will go up and down in response to supply and demand. The demand for permits will be determined by the cost of abating emissions. If abatement turns out to be relatively inexpensive, firms will tend to abate emissions rather than buy permits, so permit demand will also be low. The long-term permit price would be modest and firms would find it cheaper to buy long-term permits than to buy a corresponding string of annual permits. If abatement turns out to be expensive, permit demand will rise, as will the price of a long-term permit, and annual permits would begin to be sold. But, again, the key point is that in either case, the amount that firms spend on abatement would be capped because they would always be able to buy annual permits, if necessary, at the internationally agreed price.

Because the total supply of permits in any year would not be fixed, the policy would not guarantee precisely how much abatement will take place in that year. It would, however, ensure that any abatement would be done at minimum cost. Moreover, the pattern of abatement will be efficient across countries, as well as within each country, unless marginal costs of abatement are very low. In all countries where the price of a long-term permit rises to the fixed price cap, marginal abatement costs will be equalized. The policy also gives appropriate dynamic incentives: as long as the long-term permit price is greater than zero, firms have an incentive to investigate new methods or technologies to reduce emissions further.

The allocation of each country's long-term permits should be the subject of international negotiation, as should the fixed world price of annual permits. In view of the prevailing uncertainty, however, the initial price should be kept low. If emissions continue to rise rapidly, even after firms have had a chance to react to the policy, or if new information reveals greater risks from global warming, the price can be renegotiated, allowing the policy to evolve as more information becomes available.

Details of Trading

Countries would manage their own domestic permit trading system independently, using their own legal systems and financial institutions. International cooperation would be confined to system design and to sharing expertise.

The annual permit market would function as any normal commodity market except that an individual firm could get its permits either from the market or from the government at a predetermined world price. But, to repeat, the annual permit price is effectively fixed at the price offered by the government. The long-term permit price will vary across countries.

If new information about global warming suggests that future emission permits will be more expensive, the price of long-term permits would likely rise, signaling companies and households to change their behavior immediately rather than waiting for the world price of permits to be renegotiated. The price of the long-term permit will be the present value of the stream of expected future prices of annual emission permits. It thus acts like a futures market for carbon emission permits.

Developing Countries

The 1992 UN climate change treaty envisions all countries as ultimately contributing to reducing greenhouse gas emissions, as do we. Our blueprint commits developing countries to participate, but caps their short-run cost at zero.

At first the allocation of long-term permits in developing countries would exceed current emissions and no annual permits would be sold. But when emissions begin to grow, annual permits would be sold, thus providing a price signal to energy producers and potential investors about the expected future price of carbon in these economies. A developing country could also use the long-term permits (which cannot be traded internationally) to encourage direct investment in low-carbon energy generation in its economy.

Monitoring and Compliance

Any market used to trade a claim over a commodity must involve monitoring, as well as real costs for failure to comply with the rules. Because the value of a long-term permit depends on the amount of emissions in an economy over time, poor monitoring of emissions will sow doubt about the true levels of emissions and decrease the value of holding a permit. The same is true of compliance. If no one complies with the requirement to hold permits to match their emissions, the value of these permits will be low if not worthless.

Under Kyoto, which allows global permit trading, poor monitoring and compliance in one country can debase the entire global trading system. In our blueprint, monitoring and compliance are decentralized to each particular economy. Some countries will be able to monitor better than others and some have better

legal systems that help to impose compliance. Each system's imperfections are self-contained. In addition, the incentive to enforce the policy is internalized, both because compliance problems would cause governments to lose revenue from the annual permit market (since they would sell fewer permits) and because holders of long-term permits will pressure their governments to be vigilant in order to maintain the market value of long-term permits.

Adapting the Policy over the Long Run

Our blueprint gives governments time to monitor how their economies adjust to the higher price of carbon and to assess the state of knowledge about climate change. If the initial fixed world price for carbon is too low, the price can be raised gradually. All parties to the UN climate change treaty should meet every decade to evaluate experience and set the new global price of carbon. Some rule for negotiating the price—for example, the concurrence of 60 percent of countries—would be needed. But, as with most of our blueprint, this issue should be the subject of international negotiation.

If new information about climate change indicates that the emissions targets used to determine the initial allocation of long-term permits are too loose, several options are available. Because the most binding constraint is the annual and not the long-term permit price, member countries could call an emergency meeting and raise the annual world price of permits. Given that the price of long-term permits is the expected future price of permits, the price of long-term permits would have already risen sharply in anticipation of the emergency meeting. If the rise in long-term permit prices were inadequate, governments might need to buy back perpetual permits to reach the higher long-run equilibrium price of carbon. Issuing long-term permits with varying expiration dates would allow some long-term permits to expire, thus encouraging consistency between the prices of annual permits and long-term permits.

How to Proceed from Here

International climate negotiations have now reached a critical juncture. The path of least resistance is to continue negotiations over implementing the Kyoto Protocol. But continuing down this path allows policymakers to defer action for years and allows emissions to grow unchecked.

Our approach would address climate change immediately in a serious, but far more practical, manner. An international policy regime like the one outlined here has many advantages over Kyoto. It would have a realistic chance of ratification in countries with large carbon emissions; it would be much less unattractive to developing countries; it could expand over time to include all countries; and it would be politically sustainable over a long period of time with existing institutions and mechanisms.

Although Kyoto's targets and timetables approach must be discarded, negotiations need not begin again from scratch. Much of the negotiating work that went into the protocol produced results that could be incorporated into an alternative agreement. For example, the Kyoto emission targets set for industrialized countries would be a natural basis for the allotment of long-term permits to those countries. Allotments of long-term permits to developing countries would still need to be negotiated, but that could be left for the future since the policy regime would not be disrupted by future accessions. In addition, many UN climate change institutions would continue to play valuable roles, such as developing international standards and techniques for monitoring and measuring emissions, or helping countries implement the results of research. These institutions would foster the international cooperation essential for an effective climate change system to operate in the long run.

Moreover, our decentralized approach means that individual countries could begin creating domestic permit markets without waiting for a final international agreement to be negotiated. In fact, it would be in each country's own interest to do so, to allow its economy as much time as possible to adapt and to allow its financial markets to help manage the risks of climate policy. Governments could distribute their Kyoto allotment of long-term permits immediately, stipulating two things. First, emissions permits will not be required unless an international or domestic decision is made to reduce carbon emissions. Second, the permits will be honored at their face value if a carbon constraint is eventually imposed. The permits would be tradable without restriction.

Our approach does not reduce any of the deep uncertainties about climate change. Decades will pass before the risks and costs of greenhouse gas emissions are fully understood. Nor does our approach reduce uncertainty about whether emissions will eventually be regulated. It would, however, be nearly costless for governments to carry out, and it would confer a single, but critical, benefit on the economy: firms likely to be affected by climate regulations will suddenly have a new and powerful tool for managing their risk. For example, a firm that expects to have difficulty complying with a future constraint could reduce its risk by buying extra permits now as a hedge.

Of course, pricing these permits would present a short-run challenge for financial markets. What is the value of an emissions permit when it is not certain when, if ever, carbon emissions will be regulated? But that is precisely the type of problem that financial markets confront every day. How, for example, should investors respond to a firm's news about a new patent it has received on a product that has never been produced? Within a very short time, an active market would develop with prices that reflected both the likelihood of a policy taking effect and its probable stringency.

It is time to move away from the political compromises and posturing associated with the Kyoto approach to climate change policy. It is time for all countries to cooperate to implement a low-cost and effective climate change regime such as contained in our blueprint proposal. The current Kyoto Protocol—without the effective participation of the United States or developing countries, and with weak targets for those that are likely to ratify—postpones effective action by any major emitter for at least another decade and is not a prudent way to address a potentially important global problem.

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