MARCH 1998

WHAT'S FAIR?

AN EQUITY FRAMEWORK FOR GLOBAL CLIMATE CHANGE

EILEEN CLAUSSEN

REDEFINING PROGRESS

Redefining Progress

Fourth Floor

San Francisco, CA 94108

1-800-896-2100

Tel: 415-781-1191

Fax: 415-781-1198

E-mail: info@rprogress.org

Website: www.rprogress.org

Editor: Elisa Freeling

Acknowledgements: Redefining Progress would like to thank the V. Kann Rasmussen Foundation for funding for this paper.

Eileen Claussen

Eileen Claussen is currently a partner in the firm of Alcalde and Fay. She is the former Assistant Secretary of State for Ocean and International Environmental and Scientific Affairs. In that capacity she was responsible for developing and implementing policy on behalf of the United States on major international issues, including climate change, ozone depletion, chemicals, natural resource issues, and the sustainable development efforts of the multilateral development banks and the United Nations.

Prior to joining the Department of State, Ms. Claussen served for three years as a Special Assistant to the President and Senior Director for Global Environmental Affairs at the National Security Council. During this time, she also served as Chairman of the United Nations Multilateral Protocol Fund. From 1987 to 1993, Ms. Claussen was Director of Atmospheric Programs at the U.S. Environmental Protection Agency.

Ms. Claussen is the recipient of a number of prestigious awards including the Department of State's Career Achievement award and the Fitzhugh Green Award for Outstanding Contributions to International Environmental Protection. She received her Master of Arts degree from the University of Virginia, and her Bachelor of Arts degree from George Washington University.

TABLE OF CONTENTS

WHAT'S FAIR? AN EQUITY FRAMEWORK FOR GLOBAL CLIMATE CHANGE

by Eileen Claussen

INTRODUCTION

In 1997, over 2500 economists signed the "Economists' Statement on Climate Change," which asserts that

> . . . sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run. . . .

This paper ventures beyond the macroeconomic debate to pose a series of questions through which we might determine a fair and equitable response to the problem of global climate change. It will discuss issues of global equity (what is a balanced burden for the United States in relation to other countries); what is just for U.S. consumers and households (by looking at regional distribution and income effects, as well as at opportunities for reducing emissions); and what is equitable for industry and labor in the United States (through an analysis of sectoral impacts and opportunities for cost-effective emissions reductions). It will also consider the trade-offs between fairness and efficiency, fairness and political viability, and fairness (and synergy) on this issue versus other issues of importance in the economy and the environment. The purpose of this paper is not to answer these questions, but to set forth a framework for their consideration.

Fairness, it is important to note, has two facets in the context of addressing climate change: the issue of who bears the burden of reducing the emissions that cause climate change, and the issue of compensation for the environmental or economic damages that may occur as a result of either climate change itself or of efforts to mitigate climate change. Both will be explored in this paper.

This issue must also be viewed in a broader context. From an international perspective, we need to ask, what is required of the world community to address the climate change issue, and over what time frame? What can be said of the first step that was taken in Kyoto in December 1997, and what is the likelihood of further action? Was that first step fair, and what further system would be required for continued global progress on the issue? Domestically, we should ask whether the United States will implement the protocol in a way that can be judged as equitable, given both related, ongoing, federally sponsored actions—including environmental regulation (e.g., the ozone and particulate standards) and the restructuring of the energy industry—and the obvious regional and sectoral impacts that are likely from implementation of the Kyoto protocol.

I. THE CONTEXT

A. The Problem

The goal of the Framework Convention on Climate Change is to prevent "dangerous interference with the climate system." Although what constitutes dangerous interference has never been defined, it is widely accepted that this definition is essentially a policy judgment, rather than a scientific decision. The Parties to the Convention have not yet made this policy judgment, however, nor has there been significant debate on the issue in the Convention's subsidiary bodies. Analyses of the impacts of climate change developed by the International Panel on Climate Change (IPCC) do not look at impacts beyond a doubling of greenhouse-gas concentrations in the atmosphere from pre-industrial levels (450 ppm of CO_2 equivalent in the atmosphere). Even at that level, temperature increases that would cause the sea level to rise, damage coastal areas, alter ecosystems and vegetation, diminish water supplies, and spread infectious disease are predicted.

Most experts on this issue have concluded that reaching the long-term objective of stabilizing greenhouse-gas concentrations and preventing dangerous interference with the climate system will require both decades to achieve (given the magnitude of the economic changes that will be required) and the participation of all nations (given that virtually all nations emit greenhouse gases). This would be the case even if more ambitious targets for developed countries had been agreed to in Kyoto. Thus, while it is important to begin taking steps in the shorter term to send appropriate market signals and begin the emissions reduction process, the solution must be one that can be sustained over the longer term, with all nations committed to emissions reductions and stabilization of concentrations in the atmosphere.

B. The Kyoto Treaty

The Third Conference of the Parties to the Framework Convention on Climate Change, held in Kyoto from December 1 to 11, 1997, agreed on a legally binding treaty that constitutes the first clear step to deal with the problem of climate change. The treaty binds developed countries to emissions reductions that would be achieved between 2008 and 2012. The target for the European Union is an 8% reduction below 1990 emissions levels; for the United States, a 7% reduction; and for Japan, a 6% reduction. All other developed countries agreed to targets ranging from 6% below 1990 levels (for example, Hungary) to 10% above 1990 levels (Iceland). The Parties also agreed to an emissions trading system among countries that have binding targets and the ability to conduct emissions reduction projects jointly between developed and developing countries through a "Clean Development Mechanism." This mechanism can be used both for mitigation (i.e., reducing emissions) and for adaptation (i.e., adapting to the impacts of climate change).

Left incomplete were any commitments for developing countries, either on a voluntary basis or in a future negotiation; agreement on a compliance and enforcement regime; and specific guidelines for the operation of either the trading system or the Clean Development Mechanism. In simple terms, additional definition is required for the provisions related to flexibility in implementation (trading and joint implementation) and additional requirements are necessary to make the agreement truly global (developing country commitments) and truly binding (compliance and enforcement provisions).

It is widely believed in the United States that the treaty that was negotiated in Kyoto cannot be ratified by the U.S. Senate in its present form. This sentiment has been expressed by both treaty supporters and opponents in Congress, and by the President and Vice President. If all elements that were not negotiated in the 1997 treaty were satisfactorily completed, however, a campaign could be mounted by the Administration, the NGO community, and other supporters to gain its acceptance by Congress. Key among the issues that would have to be debated in

such a ratification campaign are the economic impact and global fairness of the treaty, as well as the justness of the national plan that would be used for its implementation.

C. Fairness and the Global Regime Negotiated in Kyoto

The protocol negotiated in Kyoto establishes differentiated commitments among countries in the developed world in the interests of fairness. Thus, for example, the European Union, considered by many to be in a better position to achieve significantly lower emissions levels than the rest of the developed world because of its low population growth and special circumstances (for example, the 1990 baseline predates German reunification and the collapse of the economy in eastern Germany), agreed to the most stringent target. Similarly, Australia, which argued the most strongly for differentiated commitments because of the importance of energy-intensive industry to its economy, negotiated the least stringent target. However, there were no agreed-upon criteria for establishing the differences in commitments, despite efforts by both Australia and Japan to include differentiation formulae in the agreement. Rather, the negotiation was intense, and based on perceived self-interest, with final obligations agreed among developed country parties on a political basis.

The issue of further commitments from developing countries was also the subject of intense discussion in the lead up to Kyoto and during the Conference itself. First debated during the negotiation of the Berlin Mandate in 1995, the Kyoto agreement reiterated the Convention's insistence on "common but differentiated responsibilities," and the Berlin Mandate's stipulation that there be no new commitments for developing countries. The United States—supported by Australia, Canada, and New Zealand—had hoped both to include language that would bind developing countries in a future agreement and to allow developing countries to accept binding targets voluntarily in return for participation in the emissions trading scheme. But there was no serious discussion of future agreements or of a mechanism that could be used to "graduate" countries from developing country

status to developed country status. Developing countries also roundly rejected the idea of voluntary commitments during the Kyoto Conference.

Although not always expressly discussed in those terms, interventions were made during the Conference in the name of fairness and equity. For example, a large number of developing countries insisted that it was unfair for them to accept additional burdens, because of their greater need for development and poverty alleviation. The Chinese delegate argued that emissions trading was inequitable because it would allow some developed countries (particularly the United States) to shirk their responsibilities to reduce their emissions, thereby placing an unjust burden on other countries.

No matter how the Kyoto agreement is judged, it is clear that the issue of fairness will dominate not only the ratification debate in the United States, but also future amendments to the Convention. On what basis will developed countries take on future obligations? Here, the trend will obviously be toward greater differentiation, but with what justification? Similarly, it is unlikely that the developed world will take on any additional obligations unless some in the developing world also commit to changes in their emissions patterns. But which countries, and on what basis? Sorting out all of these issues is a task for the next several years, with significant progress unlikely to occur until greater definition and elaboration of what constitutes fairness is agreed.

With respect to compensation for damages from climate change, some progress was made, although there was virtually no debate on the issue. The Parties agreed to minimize the impacts of their programs on the economies of others, leaving an opening for stronger measures to be taken for proper compensation in the event the damages are severe. They also agreed, as part of the Clean Development Mechanism, to pay some of the costs of adaptation to a warmer world for developing countries.

D. Fairness and Implementation of the Kyoto Treaty in the United States

When the President announced his climate change policy on October 22, 1997, he stated that he wished to pursue a broad-based emissions trading initiative to ensure that the United States would meet its binding target. He also indicated that "if there are dislocations caused by the changing patterns of energy use in America, we have a moral obligation to respond to . . . the workers and the enterprises affected . . . ."[1] The moral aspect was also invoked later in this speech, with specific references to both the importance of values in taking on the challenge of climate change, and to the imperative of passing on an ecologically sound world to future generations.

Certainly, these issues are of key importance to industry, labor, and individuals and families. Perhaps the clearest statement to this effect comes from David Smith of the AFL-CIO. While stating unequivocally that the AFL-CIO will support a climate treaty, he makes equally clear that the United States must be a true "equity partner" with the rest of the world, and that "no worker will be asked to sacrifice her economic security as we find pathways to new fuels, new work, new approaches, and new challenges, and as we create a world economy that is less carbon-dependent."[2] He goes on to add that we may need new regional development strategies as well as job and income protection for every affected worker.

While Smith's comments obviously point to the issue of transitional assistance as a key factor to be considered in any definition of fairness, they leave unasked and unexplored the question of what kind of implementation plan would minimize unbalanced impacts on industries and labor. That is the question that needs to be addressed first. Transitional assistance, then, is the secondary consideration. A just and equitable transition policy should be developed based on an assessment of past experience, including the implementation of NAFTA Trade Adjustment Assistance provisions.

1. Remarks by the President on Global Climate Change at the National Geographic Society, October 22, 1997.
2. Testimony of David Smith before the House International Relations Committee, July 24, 1997.

II. WHAT IS FAIR GLOBALLY?

Opponents of the Kyoto protocol in the United States (and of any effort to deal with the problem of climate change) have made two strong arguments: first, that any effort will impose huge costs on the economy of the United States and on its workers, and second, that it would be unfair for the United States to reduce its greenhouse-gas emissions while some other countries, particularly in the developing world, will not have to make reductions in their emissions. Underlying this claim of inequity is the view that if energy costs rise substantially as a result of a required reduction in greenhouse-gas emissions, the United States will lose its competitive position vis-a-vis the developing world.

It is possible to investigate the correlation between global energy pricing and the movement of industries and jobs in the global market, and one effort to do so by the World Resources Institute shows that national differences in energy prices do not drive investment flows.[3] But the underlying question of how to judge fairness in responses to global climate change deserves a thorough analysis. As a first step in that analysis, it is useful to look at a variety of factors that could affect overall global equity. For example, we should first examine, by country:

1. Emissions (history and trends), to consider matters of historic and future responsibility for emissions.
2. Population (history and trends), to explore how demographics have and will affect greenhouse-gas emissions.
3. Per capita emissions (history and trends), to analyze real emissions trends absent population changes.
4. Gross domestic product (total, per capita, history, and growth potential), to evaluate the ability of countries to spend on emissions controls.
5. Emissions per unit of GDP, to assess the energy intensity of different economies.

3. Robert Repetto and Crescencia Maurer, "U.S. Competitiveness is Not at Risk in the Climate Negotiations," *Climate Notes* (Washington, D.C.: World Resources Institute), October 1997.

6. Fuel mix, imports and exports, costs to produce, carbon intensity, to determine impacts from changes to less carbon-intensive fuels.
7. Industrial structure (carbon-intensive industrial base), to gauge impacts from emissions reductions.
8. Natural resource base, to weigh economic impact and fuel security issues.
9. Trade in energy-intensive industrial products (carbon intensity of trade), to evaluate balance of payments and trade impact issues.
10. Potential environmentally impacted regions and nations.
11. Potential economically impacted regions and nations.

From these data and analyses, it should be possible to analyze what the Parties to the Framework Convention on Climate Change have referred to as "equitable and appropriate contributions" to the global effort. It is important to note here that this language, which refers to the concept of equity, was meant only to apply among developed countries in their fulfillment of the Berlin Mandate. The purpose of this paper is to apply them more broadly to a representative set of countries from both the developed and developing world, since the participation of all is required to deal successfully with the climate change issue.

Since it is neither feasible nor reasonable to apply these criteria to all countries that are Parties to the Convention, we should examine a representative list. Suggested countries are: the United States, Germany, France, Japan, and Australia as representative developed countries; Russia and Poland as representative of countries in transition; China, India, Brazil, Mexico, Argentina, the Philippines, Kuwait, South Africa, Tanzania, and Western Samoa as representative developing countries.

From a cursory review of some of the key indicators for the seventeen countries in terms of their contribution to the problem, several critical questions can be asked and answered. Should fairness be based on responsibility for the problem (past, present, and future)? If the goal is to arrive at lower emissions levels, the answer must be yes. The largest emitters over time have a greater responsibility

than the smallest emitters; they are, in essence, the cause of the problem. Should we be concerned with total contribution, or per capita contribution, or both? There is no question here that per capita emissions are crucial, but if we are looking at emissions as a proxy for human welfare, perhaps per capita GDP or purchasing power parity is a fairer measure, at least as a starting point. What about countries with vast reserves of carbon-intensive fuels and significant industrial infrastructure built around that fuel base? And how should that compare with countries that are just beginning to make infrastructure investments, and where lower emitting technologies are available? Can both of these factors be used to modify a concept of human welfare to achieve a result that is just? How should trade issues be factored into equity concerns, given that suppliers of energy-intensive products reflect carbon emissions from production, whereas importers do not show any emissions contribution? Should there be a sliding scale or particular cut-off point for the entrance of developing countries into a climate control regime, based on GDP or GDP per capita?

None of these questions or answers can be assessed without an appropriate context, however. Analysis of the causes of the climate change problem clearly indicates that greater historic responsibility lies with the developed world, and with certain nations in particular, e.g., the United States. From an analysis of what it will take to find a solution, there is no doubt that all (or most) nations will have to participate, particularly the emerging large emitters from the developing world, since their emissions will account for more than half of the world's within fewer than fifteen years. Thus while there are mitigating and important national circumstances that must be considered in judging equity of obligation among nations, it should be apparent that what is being looked at here is the basis for an accommodation between the major and less significant players.

In fact, it is crucial that we seek that accommodation by moving away from a notion of equality of obligation, where we all take actions that are the same (i.e., equal effort: we all reduce our emissions by the same percentage or amount), or where we arrive at an end point that is the same (i.e., equal result: we all work

toward a uniform rate of per capita emissions). Instead, we must venture toward a notion of fairness of obligation, where we take steps that allow us to achieve higher living standards for all through cleaner economic growth and development.

Thus, for example, some countries may reduce their emissions on a percentage basis, as long as that can be done without lowering living standards (measured as purchasing power parity, or per capita GDP adjusted for the local cost of living). Others may improve their energy-efficiency ratios for their existing infrastructure and/or establish greenhouse-sensitive standards for their future investments, thus continuing to improve their living standards. What is equitable, then, relates as much to the need—and perhaps the requirement—to seize opportunities and possibilities, as to the need or requirement to take equal action. Essentially, we should establish a standard-of-living foundation, modified on the one hand by the size of contributions to the problem and on the other by opportunities to reduce contributions to the problem. It is such a framework that should be pursued in the interests of fairness.

Examining impacted regions and countries raises a separate set of questions and answers. How severe are the likely impacts, both environmental and economic? Here, there are sufficient data to identify those who would be most severely impacted by climate change or climate change mitigation, although estimates more refined than orders of magnitude do not exist. Is there a global precedent for dealing with problems of this sort, and if so, is there a way to estimate its cost-effectiveness? Is there a need for a transition policy for nations, and if there is, how should it be structured? Clearly these are questions that need to be answered.

III. WHAT IS FAIR FOR CONSUMERS AND HOUSEHOLDS?

No matter what approach is chosen to implement the Kyoto Protocol in the United States, it is inevitable that there will be some increases in energy costs to consumers. These will range from direct, increased electricity and fuel costs, to indirect price rises on products that require significant energy to produce, for example, automobiles, paints, and food. Comparing these projected increases to both household income and household expenditures will be a necessary first step in investigating the issue of equity for households.

An analysis using a $100 per ton carbon tax found that, when expressed as a percentage of income, the burden is disproportionately placed on low-income households (about 10%, compared to 1.5% of income for the wealthiest tenth of the population). Expressed as a percentage of expenditures, the burden is much less regressive: less than 4% of expenditures for the bottom tenth to just over 2% for the top.[4] However, even these comparisons must be examined in relation to a broader set of economic indicators, including employment and wage changes over time. Here the results suggest that price increases from climate abatement strategies are relatively small, and depend on the underlying model assumptions.

But these comparisons also need to be considered in a broader context. How do these cost increases compare with the costs to households of no action to abate climate change? There are analyses that suggest that food prices will rise if the world warms. Are these potential increases of the same order of magnitude as food price increases under a mitigation scenario? Similarly, how do the price increases relate to predicted changes in employment and wages over time? There is a reasonable amount of literature available to provide responses to these questions, with a quick review suggesting that the impacts on households are relatively small, but not insignificant. But the context for energy price changes is also shifting, as energy

4. James M. Poterba, "Tax Policy to Combat Global Warming: On Designing a Carbon Tax," in *Global Warming: Economic Policy Responses* , ed. Rudiger Dornbusch and James M. Poterba (Cambridge, Mass.: MIT Press, 1991), as cited in Robert Repetto and Duncan Austin, *The Costs of Climate Protection: A Guide for the Perplexed* (Washington, D.C.: World Resources Institute, 1997), 32.

restructuring creates a national market for generation and a greater equivalence in energy prices nationally. How does this trend, toward more equal pricing, balance against a trend toward greater price differentiation under a climate mitigation scenario, where the use of fossil fuels declines? All of these issues will have to be explored and assessed.

But if, as looks likely, the cost increases are small, diminish in importance over time in relation to other projected economic changes, and do not exceed the costs that would be incurred under the scenario of a warmed world, the fairness issue essentially changes its shape so that two other issues emerge: First, are there regional and community issues that are important to assess from an equity perspective, and second, if there are revenues that result from implementation of the Kyoto protocol, will these be distributed in a just way?

There are likely to be negative environmental impacts from climate change and both positive and negative economic impacts of climate change mitigation: Some communities and regions are likely to grow and become wealthier, and others are likely to be hurt, either environmentally or economically. In cases where the negative impacts are particularly severe, or where there are both significant environmental and economic impacts, the question of fairness is clearly raised, since the responsibility for emissions is far broader than any particular region or community. Is there a governmental responsibility in dealing with devastated communities who will pay the price for either climate change or climate change mitigation? There is clearly a history of governmental involvement in dealing with problems of this type, whether related to emergency assistance for natural disasters (through FEMA), or to economic development assistance to poor or economically ravaged regions (through, for example, the Appalachian Regional Commission). This issue of transitional assistance for communities is similar to the issue of transitional assistance for workers; it will have to be explored, assessed, and addressed through programs.

The second issue that emerges relates to how the revenues from any trading or taxation scheme selected to reduce emissions domestically are used, if any revenues result at all. The President has already indicated that his implementation mechanism of choice is emissions trading, and he has explicitly and specifically stated that he would not support a tax. However, were Congress to consider a taxing scheme, particularly if it is a tax shift that is part of overall tax reform, it is unlikely that the Administration would raise objection. If, on the other hand, a trading program is the option chosen, the revenue issue continues to be important. Should the tradable permits be allocated to industry based on historic emissions, in which case the asset is given away and there are no revenues to distribute? Should they be auctioned off, in which case there would be both significant revenues and significant consumer price increases, some of which could be offset by a redistribution of the revenue? Are there other allocation schemes that use something other than historic emissions as a base? Is there a blend of an auction and an allocation that could be viewed as equitable to all parties?

Even beyond the implementation plan chosen, there are fairness issues related to the distribution of any revenues. Should they be used to mitigate the additional costs, perhaps to poorer households where the effects are most regressive and unjust? Or should they be more evenly distributed to consumers on the grounds that the revenues from protecting a universally held asset (the atmosphere) belong equally to everyone? Even more fundamentally, if addressing climate change is going to require decades of effort and major technological changes, should this revenue, which could be substantial, be used for investments in technology that will lower the costs to households in the future? There are obvious equity tradeoffs here that will have to be explored, including those that relate to current costs and future benefits.

IV. WHAT IS FAIR FOR INDUSTRY AND LABOR?

In looking at industry within the United States, it is most useful to divide the review among energy supply sectors (coal, petroleum, natural gas, and nuclear power generation), and energy end-use sectors (buildings, industrial, transportation, agriculture, and service). Numerous assessments of the economic impacts on each of these sectors currently exist, although there are different views on both the extent of the impact and on the opportunities for reduced generation of greenhouse gases. Many of these assessments have been done using macro models that are dominated by a key set of assumptions that in turn produce a particular set of results, as has been ably pointed out by WRI.[5] These assumptions relate, for example, to the rate of technological change (typically assumed on an historic basis); the behavior of the private sector in responding to policy changes (typically assumed to be inefficient); and scope for product and fuel substitution (assumed to be minimal). For those who do not subscribe to the macro modeling results, there are economists who have analyzed sector by sector the impacts and opportunities, using "bottom up" engineering models. But these, too, have a set of assumptions that bias the results. Notwithstanding the differences in both assumptions and results, it is possible to look broadly and relatively at the impacts, and discuss fairness and transition concerns.

Examining the energy supply sector, it is worth noting the relative emissions contribution of the different fuels, with petroleum at approximately 42%, natural gas at 24%, and coal at 34%. Most analyses agree that responses to climate change will reduce the use of all fossil fuels, with coal bearing the brunt of the reduction. Because of higher prices for fossil fuels, the major energy-intensive industries will also be put at a disadvantage. These include aluminum, iron and steel, chemicals, petroleum refining, glass, pulp and paper, and cement. However, the opportunities for reducing emissions are not uniform across these sectors, since some have taken steps to improve their energy intensity and others have not, and some have

5. Robert Repetto and Duncan Austin, *The Costs of Climate Protection: A Guide for the Perplexed* (Washington, D.C.: World Resources Institute, 1997), 5-7.

significant further possible advances, and others have not. Is it then fair for those who have already made significant improvement, and who have little extra opportunity for further improvement, to bear the same burden as those who can achieve significant reductions at far lower cost? Or should we here, as was suggested in the case of global equity issues, try to achieve a balance between contribution to the problem and opportunity to reduce that contribution? The same framework can also be used for other sectors, including transportation, buildings, agriculture and service, where emissions contributions should be weighed against opportunities for emissions reductions.

In addition to making these comparisons, however, it is important to assess transition issues, both for industries that could be heavily impacted, as well as for the labor forces in those industries. With respect to labor, we can relatively easily determine the labor forces at risk, look at them both regionally and sectorally in relation to growth in other sectors, and assess the efficacy of past and current transitional assistance, both here and abroad. This is an issue that needs to be addressed for heavily impacted industries, and most important for labor, where it is the only serious way to deal with the concept of what is fair.

V. POLICY TRADE-OFFS

No policy responses are made in a vacuum, and the relationship between fairness concerns and other issues must be addressed. For example, there is little question that some responses to the climate change issue could be economically efficient, but unjust. Sharp increases in fuel price would change behavior, but at a cost to individuals and labor that might be unacceptable from an equity perspective. Similarly, the speed with which changes occur will affect fairness, with longer adjustment periods considered far more just than abrupt changes. These issues should be explored in more detail in an effort to find solutions that meet both fairness and efficiency criteria.

Other trade-offs are also important. For example, the most effective, fair, and equitable domestic implementation scheme may not be politically viable if certain political criteria are not met. These relate primarily to the importance of labor, state, and regional impacts. Again, these need to be explored in more detail.

Finally, there is obvious unexplored synergy between responses to the climate change issue and other issues of political importance. Key examples here include tax policy issues, where changes in incentives, credits, and overall structure will affect climate change, just as policies to mitigate climate change will have a broader effect on tax policy; air pollution regulatory issues, where implementation of the new standards on ozone and particulates can be done in ways that will also reduce greenhouse-gas emissions, providing a "double benefit" for the environment; and electricity deregulation, where incentives for renewable energy, for low-emission technologies, and for information disclosure can all affect the cost and fairness of climate change responses.

CONCLUSION

Only when decisionmakers at the national and international levels delve into the equity considerations framed in this paper in a serious and sustained way will we be able to develop the consensus necessary to avert climate change, and the economic and environmental havoc it is likely to bring.