
Pathway, Not Stopgap: Climate as a Down Payment on Sustainable Development

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"We can only get people to behave in an ecological way – compatible with nature – when we give up the idea of making sacrifices and being ascetic. Egoism is one of the strongest forces in the living world."

– Frederic Vester, biochemist and systems pioneer

I. Introduction

Most participants in the climate change debate agree that reducing carbon emissions will be costly. Mitigating climate change will require a massive overhaul of our infrastructure, the development of new technologies, and changes in the way that we consume resources. However, as some prominent economists and environmentalists have argued (see e.g. Stavín 1997; Esty 1994; Meadows 1971), the idea of *new* costs is deeply misleading.

The great wealth produced in the developed world over the past fifty years has been spurred by a wave of liberalized trade and increasingly integrated markets, allowing for greater specialization and the connection of high-demand consumption with low-cost products and resources. Extraction and production in exporting countries is increasingly rapid and efficient, while importing countries have seen a dramatic rise in levels of consumption. The long-term damage to the environment, however, is profound. Forests have been unsustainably chopped, fisheries have been severely depleted, and hills in commodity-exporting countries have been leveled while new hills of waste in importing countries have been erected.

In this larger context, the climate problem is better seen as another symptom of unsustainable development, rather than a standalone issue. Like forests and fisheries, the planetary balance of heat-trapping gases has been disrupted by increasing consumption of carbon-emitting products. The human race is in fact already paying the high cost of climate through rising temperatures and their impacts, and the science shows that the full bill will come due over the next 100 years (IPCC 2007). The potential cost is staggering, with projections on the order of 5-20% of global GDP loss (Krugman 2008, Stern 2006).

Consequently, the issue of costs should be reframed. Our task in responding to climate change isn't deciding who will pay to avert a discrete crisis; it is rather to face our global responsibility to pay as we go.

If this sounds sensible, then one might ask why we haven't been paying for externalities like climate all along. Several real hurdles have made this hard to sell. First, our inaccurate measurement and monitoring tools have made the task of determining and allocating a "price" for externalities very difficult. Though these tools have developed at a rapid pace over the last 50 years, a capacity deficit and a large degree of uncertainty will continue to stymie the process. Second, political difference of opinion about the level of acceptable anthropogenic change to the environment is difficult to resolve. Even if

our scientific measurements were perfect, society would still need to agree on the level of acceptable atmospheric change, deforestation, or fisheries depletion. Finally and most importantly, even if we were able to determine a price for emissions or other environmental damage, the problem of internalizing costs suffers from major collective action problems. Though the human race has a collective interest in internalizing the cost of environmental problems like carbon emissions, our multilateral competitive political and economic system spurs domestic interest groups to lobby for lower environmental standards (Esty 1994, 226).

The current environmental collective action problem resembles many aspects of the collective action problem facing the global trade regime prior to the 1940s. At this time, the multilateral, competitive trade environment created strong incentives for domestic interest groups to seek trade protection, even though the collective population had an interest in the efficiency gains from free trade. The result was a devastating tariff war during the Great Depression of the 1930s that left everyone worse off.

The collapse of the global trading system was a disaster, but it was also an opportunity that created one of the most effective multilateral systems in the world, the World Trade Organization (WTO). Daniel Esty, a prominent author and director of the Yale Center for Environmental Law and Policy, has joked that it would take a similar environmental disaster to mobilize collective action on the environment (Esty 1994). The climate issue is just such a "disaster" and should be seen, like the Great Depression, as an opportunity to mobilize collective action for real and fundamental change toward a more sustainable development pathway.

There are several reasons that climate should be used as an opportunity to merge environmental costs into our economic system. First, the problems of measurement and scientific knowledge have been resolved to a great degree. Though uncertainty about the impact of emissions remains, our tools are sufficiently accurate to determine a baseline of "normal" atmospheric levels and how discrete human activities contribute to raising or lowering it (see IPCC 2007). Second, debates over what level of anthropogenic change in the atmosphere is acceptable have been narrowed considerably (see IPCC 2007). Largely as a result of efforts by the Intergovernmental Panel on Climate Change, environmental NGOs, and prominent activists, climate change is a problem that has been recognized by virtually every government in the world. These same efforts have mobilized diffuse interest groups within many countries, providing a counterweight to polluters who would face higher costs. Most importantly, the present and future actions of every country will matter, so any solution will require global action.

Unlike perhaps any environmental problem before it, climate change provides the urgency and scope to mobilize global collective action. The incredible potential to mobilize around this problem should be used as an opportunity to begin to adapt our existing economic system to a more sustainable pathway, with action on climate change as the first step. In this paper I propose specific features of a new multilateral environmental agreement (MEA) that would both address climate change and set the stage for further collective action on sustainable development. These features include internalizing the cost of climate change, easing the transition of national economies to sustainable emissions, and shifting the burden from the poorest countries onto the wealthiest ones. Equally importantly, the framework for addressing climate change would be a model for solving other global environmental issues, serving as a first step on the road to larger sustainable development.

Specifically, I argue that a new global environmental agreement addressing climate change should have the following four features:

It should ultimately internalize the cost of emissions into the market through a **global carbon tax on emissions**, so that future market choices reflect those environmental costs;

By implementing a **universal system of new "carbon standards" and "green milestones,"** it should provide an incentives-based, transparent, and realistic path for industries in every country to become more sustainable;

By phasing commitments and requiring aid from developed countries to developing ones, it should seek to shift the burden of transition onto those most able to bear it; and

It should serve as a **test model for solving other global environmental problems** using the same method of internalizing costs.

In this paper, I seek to explain why these four goals should be at the core of the next multilateral environmental agreement (MEA) and to set forth their proposed implementation. The paper proceeds as follows. The main section of the paper (II) explains the model, outlining each core goal in greater detail and explaining how they will work together to create an effective system for mitigating climate change. Section II will also show what implementation might look like within a particular country. The following section (III) will look at the political landscape within the developed world, showing why key countries like the United States should advocate for this model. Though I also make a brief mention of developing countries, my focus here is on the developed world. I conclude by briefly discussing additional considerations not addressed by this paper, including adaptation and enforcement.

II. Common Responsibilities: a Global Standard for Carbon Emissions

(1) *A global carbon tax on emissions.*

The cornerstone of the model is a global carbon tax on emissions. The tax would eventually be applied to all global carbon emissions, raising the cost of those emissions to reflect their anthropogenic impact on the atmosphere while providing incentives for downstream consumers within the market to choose less harmful technologies and products.

How it would be developed. The carbon tax would be set globally, based upon a scientifically determined (and politically agreed upon) optimal level of global emissions. With current advances in our understanding of the effects of emissions on climate and our technology for measuring those emissions, the calculation of a global carbon tax is now within our technological capacity to determine. Scientists in the IPCC have determined with accuracy the average levels of carbon in the Earth's atmosphere going back more than 650,000 years (IPCC 2007, 5), and these averages have been compared with current levels to determine the level of anthropogenic impact our activities are having. Combined with increasingly accurate and accessible means of measuring existing emissions (See e.g. ISO 2008; Baue 2007), it would be possible to assign a global tax on each firm based on the extent to which their current emissions contribute to a rise above pre-existing levels. Enabled by these scientific and technical tools, countries would need to then agree on a global carbon tax level based on our

desired level of total emissions – the “common” in “common but differentiated responsibilities.” Though internalization of costs for all emissions is desired over the long-term, however, flexibility would be built into the system at both the global and the national level. At the global level, deadlines for phasing in the carbon tax would be set for each country individually, allowing poorer countries more time to adapt and requiring developed countries to begin the process first. In addition, the MEA could initially limit the tax to particular industries, based on feasibility of adaptation, level of emissions, and considerations of the overall global emissions target. The resulting schedule would look something like the following:

Country	Sector Targets (date by which carbon tax imposed)			
		Energy	Cement	Transportation
United States		2015	2020	2025
China		2040	2035	2035
EU		2020	2020	2020

Figure 1. Example of a global carbon tax schedule. The above schedule sets dates by which a member country must have imposed the carbon tax on the sector listed. All dates would be determined in global negotiations, based on country and industry capacity balanced against the requirements for mitigation.

Within this internationally defined framework, each country would have the option to decide when and how it would begin to mitigate against climate change. Given the potentially catastrophic damage of climate change as well as the huge task of mitigation, this tax would likely be quite large, and countries and industries would be strongly motivated to take immediate action to reduce carbon emissions prior to the levying of the tax.

Advantages. Of all of the methods available to adjust to carbon emissions, a tax is the most integrated and efficient solution. Unlike top-down regulation or an emissions trading scheme, a tax integrates emissions costs directly into the existing economic structure, taking advantage of well-developed market mechanisms for regulating consumption. A global tax also has the benefit of working within the existing multilateral economic system, reducing the scope of conflict with existing trade rules and more easily winning support from free traders and economists (Esty 1994, 227). Moreover, a tax would be able to take advantage of existing domestic infrastructure, rather than spending limited resources to create a new system and a large bureaucracy to run it. This would also make a carbon tax easier to enforce and avoid the loopholes that would be present in any large new regulatory apparatus. Finally, a tax would be neutral, eliminating market distortions caused by regulation and subsidies (WSJ 2008).

A final advantage is that taxation will generate revenue, which can be used to fund adaptation efforts within the developing world and to mitigate against the potentially damaging effects of higher prices on the poor.

Disadvantages. Probably the largest traditional objection is that a tax would decrease competitiveness by raising prices. However, a universal global tax eliminates this problem by harmonizing the price

change in all countries. A second important objection is that a tax would be unduly burdensome for the poor and for industries with low profits, as rising prices make certain necessities unaffordable. This problem is partly addressed by features of the MEA, including time for sector to adapt and burden shifting onto developed countries. However, those at the margins will need to be protected from disparate impacts as prices rise, possibly in the form of a tax credit or exemptions in other areas.

Alternatives. One disadvantage of a carbon tax would be the abandonment of the emissions trading schemes set up by the Kyoto Protocol and within the EU, into which resources and time have already been invested. However, in addition to all of the advantages of a carbon tax listed above, there are several reasons why a global emissions trading scheme will not work. First, emissions trading on the global level and would require a large apparatus to manage it – one that would be more unwieldy and open to abuse than a global tax scheme. Second, many developing countries, which could build upon existing infrastructure in instituting a tax, would have to start from scratch with emissions trading, which would be very problematic. In addition, the firm cap on emissions under a trading scheme is unlikely to appeal to developing countries like China, who would prefer a more flexible taxation system that would allow it to pay as it goes (Nader 2008). Finally, emissions trading, even if it were workable, would be a band-aid rather than a cure for our unsustainable economic system since it is less likely than a tax to work in other environmental contexts.

(2) A universal system of carbon standards and green milestones

A second cornerstone of the global MEA would be a universal system of “carbon standards” and “green milestones” (CSGM). In the short term, the CSGM would serve as an optional roadmap for firms who want to decrease their carbon footprint and build toward a sustainable development paradigm. Hitting the green milestones of the CSGM within a realistic timeframe would allow firms to enjoy emissions tax exemptions, benefit from an internationally recognized “green labeling system,” and put them on track to be competitive in the new sustainable economy.

How it would be developed. Using the global targets for industry set by international negotiations, the CSGM would provide a series of “green milestones” that companies could reach by achieving certain reduced levels of carbon emissions and meeting certain standards. By pursuing these milestones, private firms and governments would reduce their share of total emissions within a timeframe that balanced capacity with the need for real reductions.

Using the process for standards development created by the International Organization for Standardization (ISO), the MEA Secretariat (perhaps in collaboration with the ISO) would convene a roundtable of scientists and sector experts from its member countries for a technical consultation to follow immediately after the negotiations conclude. Guided by the science and the agreed-upon global targets, technical sub-committees of sector experts and scientists would set realistic milestones and timeframes for individual firms to reduce their carbon footprints.

What it would look like. Using the ISO’s generic 140001 system of environmental management as a starting point, each standard would set forth a series of realistic sector-specific green milestones for firms upon the path to a smaller carbon footprint. At minimum, there should be three green milestones, with some kind of labeling system distinguishing them – for our purposes blue, teal, and green. Firms that meet a particular milestone would benefit from a carbon labeling system that would allow

them to market to consumers as having met the "blue," "teal," or "green" standard of carbon sustainability. This labeling system would provide consumers with valuable information about the carbon footprint of the products they buy, creating one incentive for companies to pursue the path to standardization. Because the labeling system would be based on an international standard, moreover, firms anywhere in the world could qualify for a particular color standard and market themselves around the world that way.

In addition to the labeling system and series of milestones, the roundtable of scientists and experts would compile a menu of best-practices options for firms to pursue toward lowering their carbon footprint. This list of options could be updated on a regular basis (e.g. annually, biannually) as new approaches and new technologies within each sector become available.

Advantages. The CSGM would supplement the carbon tax with a guiding, but optional, framework for individual firms to pursue sustainable development aims. While remaining optional, however, the CSGM would also tie each milestone to specific incentives, including product labeling privileges and tax exemptions, giving firms distinct rewards for pursuing a sustainable path.

A global system of universal carbon standards and green milestones would also solve important collective action problems and allow industries to benefit from economies of scale. By providing a universal framework, the CSGM would create a source of information for firms around the world to use as a guide in planning their own development. By updating best practices in the standard on a regular basis, the most up-to-date procedures and technologies within each sector would be available. In addition, the coordinated movement of similar types of firms along a single pathway would create a strong demand for technologies to facilitate reduction of emissions and generate desired innovation and jobs within the environmental goods and services (EGS) sector. Finally, harmonized carbon standards would improve the efficiency of monitoring and reporting emissions.

(3) Easing the transition to sustainable development and shifting the burden onto those who can most easily bear it

(a) Easing the transition

The task of easing the transition to sustainable development will be crucial to protecting the vulnerable elements of the global society and to creating the most efficient process possible. Once given the appropriate signal, systems need time to respond to change. By combining a phased tax with a set of carbon standards and green milestones, the model seeks to ease the transition of firms to sustainability. There are several reasons that transition time is necessary. An immediately initiated tax, while generating revenue and beginning to exert appropriate market signals, would be politically hard to sell and damaging to firms and the consumers who would bear the higher cost of carbon-intensive products. In addition, the necessary technology and capacity may be unavailable, leaving firms with no option to adjust. Finally, an immediate tax would penalize and reduce the funds available to firms at a time when we want them to be investing in new infrastructure, technology, and processes.

Instead, the carbon standards/green milestones system provides guidance for firms to begin to adapt on their own initiative in advance of the tax. Firms making this proactive choice are rewarded both

by specific incentives and lower carbon emissions, which ultimately reduces their exposure to the impending carbon tax. Though the carbon standards system is optional, the goal is to align incentives so strongly with achieving green milestones that most firms will aggressively pursue a policy of reducing their carbon footprint.

An example best illustrates how this would work. Note that the following example seeks to show how the combination of standards and taxes might work in practice, but that much of these decisions are left to the individual country to determine. The only requirements set internationally are (1) the deadlines by which a country must have implemented its carbon tax within each sector and (2) the specific requirements needed to achieve the different green milestones within the carbon standards system.

An illustrative example. According to the MEA, the country of Alba must have a fully phased in carbon tax within 20 years. In consultation with the MEA Secretariat's energy sector experts as well as its own domestic energy sector, Alba determines that firms can and should achieve each of the blue, teal and green milestones within the carbon standards system within fifteen years, taking five years between each milestone. For this example, according to the CSGM, each milestone represents a further 25% reduction of a firm's carbon footprint relative to the milestone before it, so that a "green" firm would be emitting 25% of the emissions of an unlabeled firm.

Based on these determinations, Alba then sets the following schedule for phasing in the carbon tax: In Year Five, 33% of the total carbon tax will be levied annually on all firms who have failed to achieve the blue milestone, while those who have achieved at least blue will remain tax exempt. In Year Ten, the tax for firms below the blue level will be increased to 66% of the total tax, while the tax for firms who have achieved the blue level but failed to achieve the teal level will be increased to 33%. In Year Fifteen, firms below the blue level will be taxed 100% of the total carbon tax; firms who have achieved blue will be taxed at 66%; and firms who have achieved the teal level will be taxed at 33%. Firms who have managed to achieve the green level will enjoy tax exemption for another five years, after which every firm in the sector will be taxed at the full 100%.

To illustrate how the system might work within Alba, we will look at a sample firm. Zelco Industries is an energy sector company whose current emissions would be taxed at \$10.00 per year under a full carbon tax and who would fall below the blue milestone in terms of emissions. However, under the Alba policy, Zelco remains untaxed for the first five years. Furthermore, if Zelco is able to achieve a blue rating under the standards system by Year Five (when Zelco is emitting 75% or less of its original quantity), the teal rating by Year Ten (when it is emitting 50% of the original), and the green rating by Year Fifteen (when it is emitting 25%), Zelco will avoid taxes altogether, only being taxed in year Twenty, when its tax on emissions is no higher than \$2.50. Not only is the new tax more affordable for Zelco than it would have been in Year 1, but the firm has had an opportunity to plan for the tax and to take advantage of new technologies that have developed in the interim. Because the tax is continuous with emissions, moreover, Zelco has an incentive to continue to lower its emissions as long as it is economically feasible to do so.

Now assume that Zelco makes some progress toward the blue milestone but fails to reach it by Year Five, reducing its emissions to 80% of original levels. Zelco would then be obligated to pay 33% of

the \$8.00 that it owes. If Zelco fails to make any further progress, it will be taxed 66% of \$8.00 in Year Ten and the full \$8.00 in Year Fifteen. If Zelco redoubles its efforts and reaches the teal milestone by Year Ten, however, then Zelco would enjoy full tax exemption again. If Zelco manages to achieve blue by Year Ten, then it will avoid the increase to 66% but will still be subject to a tax of 33% on its emissions.

As this example illustrates, the CSGM provides a series of goals and a pathway for countries to follow, while the pending international carbon tax creates the incentive. Countries then create a plan domestically that maximizes the incentives for companies to make the transition while easing the process as much as possible. In the example above, Alba sets deadlines for industries to achieve each milestone and ties success to carbon tax exemptions. At the end of this development arc, most firms will have significantly lowered their emissions levels, so that by the time the full tax is levied it will reflect only a modest and bearable increase in price. Competition within the sector also drives firms to lower their emissions and seek new, greener ways of operating. Even if a firm can bear the cost of a tax, it will have to contend with firms that both avoid the tax (and are possibly able to offer lower prices) and benefit from a labeling system that communicates to downstream consumers that they are the more carbon-friendly choice.

In addition, since the set of standards is universally recognized and internationally administered, foreign competitors may seek to sell their products under the labeling system as well. Since each milestone is commensurate with a certain level of carbon emissions determined at the international level, downstream consumers, regardless of country, know that a particular label represents a particular carbon footprint.

Under this system, carbon taxes are not levied in order to be collected; rather, by keying each phase of taxes to the realistic green milestones that have been set by science and sector experts within the MEA Secretariat, the hope is that motivated firms are able to avoid the tax by seeking to achieve the green milestones set forth within the carbon standard. Firms, of course, have the choice of continuing their current level of emissions and/or proceeding more slowly toward reducing their emissions, as long as they are willing to bear the cost of the tax and can compete with firms bearing "greener" labels.

In any case, the question of how to use the tax revenues would undoubtedly be a sensitive one. In order to avoid the criticism domestically that a carbon tax is merely an attempt by the government to raise revenue for other projects, tax revenues should be pre-committed to providing funding for initiatives under the treaty; all or some substantial portion of the tax revenue should, moreover, be dedicated directly to helping developing countries, perhaps being placed in a globally administered fund.

An additional capstone to this system could be a policy of "green grants" paid for by the government, possibly using carbon tax revenues. Firms within each sector could apply for these grants by submitting a plan that outlined the steps that would be taken to achieve a particular milestone. Upon approval by the granting government, that company would be given money to facilitate movement toward a particular milestone. If the company is able to achieve that milestone within the expected timeframe, it would become eligible for further grant money. If it fails to reach that milestone, however, some system for penalizing that firm would need to be developed. Though this grant system would create additional bureaucracy to administer, it might go a long way toward enabling

firms to actively seek targets. For developed countries, it would ultimately depend on domestic political choices. For developing countries, some form of assistance like that described below would probably be required, using international funds.

(b) Shifting the burden

Another key component of any MEA would be provisions for shifting the burden of adaptation onto those who can most easily bear it. Domestically, countries will have to develop programs to protect their lower classes from rising prices, perhaps through some new tax structure or credit system. Internationally, the focus will be on shifting the burden from developing countries onto wealthier ones.

One primary means of shifting the burden for climate change onto wealthier countries will be through the sequencing of country obligations to implement the carbon tax. Though the tax will need to eventually be levied globally, the wealthiest countries will be required to phase in the tax first, followed by the poorer countries. This makes sense for two reasons. First, wealthier countries will be better able to bear the huge financial burden of internalizing the cost of climate change. The shift will be most expensive for the path-breaking countries, which must invent new technologies and move up the learning curve. Though this will have negative impacts on the consumption patterns of developed countries, it will be unlikely to have effects as disastrous as would be the case in the poorest countries. The second reason that developed countries should go first is that it will be more efficient in the long run. Developed countries like the United States and those in Western Europe generally enjoy a comparative advantage in innovation, so they should be the first to take on the task of developing cheaper and more efficient technologies. Finally, developed countries should take on the increased financial burden for equity reasons. This initial, greater cost borne by the developed world (including tax revenues generated) is part of the developed world's "differentiated" (and greater) responsibility to address climate change.

Any country (or firm) may choose to adjust earlier than its obligations require, of course, and the product labeling system will be a continuing incentive for globally competitive larger firms within the developing world.

In addition to going first, developed countries will also need to provide meaningful financial and technical assistance to poorer countries for adapting to a sustainable system. That should include a program for fully sharing technologies, for subsidizing the export of environmental goods and services, and for funding adaptation efforts within developing countries themselves.

A program for fully sharing technologies. If poorer countries are going to benefit from the cheap, efficient technologies invented by developed countries, there needs to be some form of free or subsidized transfer of those technologies from developed country firms. The patent system in countries like the United States, which rewards firms for engaging in costly research and development (R&D) by granting them monopolies over new technologies, will need to be modified to allow the sharing of technologies. Developed countries should be obligated to facilitate the free transfer of technologies from domestic firms to developing countries but left to determine individually how this will happen.

To give an example of how this might work, developed countries that engage in subsidized funding for R&D within the green technology sector could require firms receiving funds to accept special conditions on new patents, e.g. limiting them to the country of production or shortening their duration. In addition, developed countries could financially subsidize the licensing of this technology in the developing world.

Subsidizing exportation of environmental goods and services (EGS). Another method for transferring wealth to developing countries would be for developed countries to subsidize the export of environmental goods and services. Having already moved down the learning curve in their home countries, the environmental goods and services sectors within developed countries will already have become more efficient, effective, and lower-cost. In this way, the burden of "going first" assumed by developed countries will have already yielded benefits for developing countries. In addition to these efficiencies gained by moving down the learning curve, the environmental goods and services sector may also need to receive additional monetary subsidies from developed country governments of technology and expertise exported to developing countries.

Additional aid will likely be needed. This aid could take the form of a traditional subsidy, effectively resulting in a transfer of wealth to the receiving state. One advantage of this is that it would simultaneously support domestic industries within developed countries, making it easier to sell politically. Another means of effectively subsidizing these efforts might be to offer tax exemptions or other incentives to firms who engage in capacity-building projects within developing countries.

Funding adaptation efforts. One component of the financial support should be the availability of funds for projects within developing countries. Projects should include not only efforts to move to a more sustainable economic paradigm, but also adaptation efforts that respond to the negative environmental effects of climate change (desertification, rising sea levels, etc.) and protect the poorest members of the population from the adverse impacts of rising prices.

Though elaboration on a complete funding scheme for developing countries is beyond the scope of this paper, some dedicated portion of carbon tax revenues collected by developed countries should be used for this purpose. The rest of the funding could be provided by obligating specific commitments from developed countries or by seeking voluntary donations from private enterprises and individuals from around the world. Within developed countries, tapping into small donors using the Internet could raise a potentially sizable amount of money.

Summary. The current proposal employs a number of methods to ease the transition for firms toward a sustainable carbon footprint and to shift the burden onto those who can most easily bear it.

To ease the transition of firms, countries have the option of phasing the implementation of the carbon tax within the framework of the larger MEA, giving firms time to adapt their practices. In addition, the carbon standard, with its series of green milestones, provides a realistic and attainable road map that – when tied to sufficient tax exemptions, labeling privileges, and grants – firms should be highly motivated to follow. Furthermore, the imposition of a uniform, global carbon tax and a global labeling system both ease fears that sustainability will hurt a firm's competitiveness internationally. Though differences in global taxation will exist in the short run due to the staggered nature of coun-

try obligations, countries and firms may make plans to mitigate these competitive effects in the short-term, knowing that any subsidy or belt-tightening will become less and less necessary as the world adapts to a uniform standard. In addition, the ability of a firm to tout its own small carbon footprint can help it compete with firms whose practices are less sustainable.

Finally, this shifts the burden of the response to climate change by obligating developed countries to bear more of the cost. First, developed countries must go first, bearing the costs of getting up the learning curve toward cheaper and more efficient sustainable technologies and effectively subsidizing the export of cheap environmental goods and services to developing countries. Second, developed countries must require their firms to share technologies, either through negotiating more limited patents or by paying their firms to license technology directly to the developing world. Finally, developed countries will be obligated to pay the revenues from their carbon tax into a global fund to assist developing countries, along with additional obligated funds.

(4) Serving as a model for other environmental problems

In addition to the other reasons discussed above, the provisions of this MEA should be seen as the first step toward a more sustainable economic system. As mentioned in the introduction to this paper, carbon is only one small part of the larger global problem of unsustainable growth, which is largely due to externalized environmental costs. As the "poster child" crisis for this problem, climate can serve as a catalyst to mobilize collective action around an international system. We should not waste this opportunity to move closer to a sustainable world.

For this reason, the system for dealing with climate change should be designed not only to integrate as easily as possible with the current economic system, but it should also be reproducible in other areas where environmental externalities are driving us toward unsustainable development.

In terms of ease of integration into the current system, a tax is widely recognized as one of the most efficient and straightforward methods. The potentially damaging effects of higher prices on the poor and on firms are mitigated by a phased implementation and help for firms to move toward a small footprint in advance of the tax. When the tax is imposed, society will have already adapted to a less carbon-intensive society, making the costs of the new tax bearable. A global standard eliminates Balkanization, thereby increasing simplicity and transparency, eliminating potential leakage effects, and allowing countries with more capacity to pave the way for countries with less capacity.

This approach may also be easily exported to other environmental problems involving global goods. Though assigning a value to resources will always be politically and scientifically fraught, the use of a tax scheme to internalize costs can be used in virtually any case to harness the power of the market without disrupting or further complicating the current international political system.

III. Differentiated Responsibilities: The Case of the United States

As mentioned above, the problems of easing the transition and shifting the burden are best addressed in part by having developed countries go first in assuming the costs of carbon emissions. The process of internalizing costs will be painful. This will be politically difficult for developed countries to accept, as evidenced by the low standards and notable defections from the Kyoto Protocol.

The notion that developed countries should assume a greater burden for climate change is not new. The idea was enshrined at the Rio Conference and validated by the Berlin Declaration, and the Kyoto Protocol represented an implicit acceptance of this principle. More importantly, the argument of developing countries that the developed world is responsible for most existing pollution and can afford to pay more has achieved the status of an international moral norm.

This is one concession the developed world will almost certainly make considering the normative value of that claim and the need to get developing countries on board.

In addition to going first, developed countries will have to make extremely costly commitments. Several factors, however, will probably make it easier for developed countries to accept. First, the science of climate change has progressed to the point where the scientists themselves are warning that action must be taken (IPCC 2007), and it has become harder to refute the enormous danger posed by climate change. Second, environmental NGOs, action networks, and activists have successfully raised public awareness and support for action on climate change in developed countries, pushing those governments toward action. Finally, many developed countries have already taken steps toward responding to climate change, including an EU-wide carbon trading scheme and carbon taxes in Scandinavia and New Zealand.

In the United States, perhaps the most important country to enlist in any climate regime, recent economic and political shifts have also made the assumption of obligations like those suggested in this paper more likely. The incoming Obama administration was elected partly on a pro-climate platform, along with promises to achieve energy independence and assume greater responsibility as a global citizen. Coupled with that, the United States legislature has a strong Democratic majority in both houses, with indications that environment and climate change will be important issues (see Broder 2008).

The current economic crisis, which some have argued will be an obstacle to progress on climate, may actually represent a unique opportunity for governments like the United States to take on new obligations to switch to a more sustainable carbon economy. First, the financial crisis has weakened important blocking actors. The U.S. automobile sector, for example, which lobbied against a government response to climate change in the 1990's, is now at the mercy of the government. Consumers themselves, who would have resisted an obligation like climate change in good economic times, have been pummeled by economic crises. Many Americans now share a sense that the current system isn't working properly and that reform on a massive scale is needed, even if it requires changes in their own consumption patterns. Finally and most importantly, the current economic crisis has created an opportunity for public funding on a scale that hasn't been seen in decades. Prominent economists like Paul Krugman have compared the current crisis to the Great Depression and argued that only a massive government spending program can jumpstart the economy (Krugman 2008). In keeping with this, the Obama administration has promised an enormous stimulus package that involves investment in infrastructure, "green jobs," and renewable energy (Baker 2008).

This U.S. plan to revitalize the economy could easily align with the adaptation to climate change proposed herein, and there are several reasons that the United States might support an MEA along the lines outlined above. First, an MEA could lock in U.S. obligations to invest in its infrastructure and help to counter domestic blockers. Second, the universal international standards developed by an MEA would facilitate the process of updating the infrastructure of U.S. industries, as described above.

Third, an MEA would ensure a long-term demand for environmental goods and services, which would protect the "green economy" that the current administration seeks to create. Finally, the idea of using market-based incentives would appeal to those within the United States who resist a command-and-control structure. The MEA, especially since its universal and phased-in nature alleviates concerns about competitiveness, would more easily win the support of free traders and fiscal conservatives in the United States.

In addition to winning support from the United States and other developed countries, the current MEA proposal would also appeal to developing countries for a number of reasons. First, the provisions for developed countries to go first and to provide aid are obviously advantageous. Second, a global tax would be relatively easy for developing countries to implement, would be a source of revenue, and would alleviate fears about competitiveness. Third, the creation of a single global set of environmental standards and a global environmental labeling system would help to eliminate policy Balkanization and make it easier for developing countries to sell products within developed country markets. Finally, this system would allow developing countries to leapfrog over the phase of high-emissions development with the help of developed countries, transferring valuable technology and providing for a cleaner environment.

IV. Conclusion

In this paper I have attempted to outline a plan that would internalize the costs of carbon emissions, provide incentives for firms to adapt, and create a universal environmental standard. I have also attempted to take the needs of poorer populations into account, while creating a system that could be used as a guide for further global environmental action. In doing that, the wider goal of this paper has been to think about how climate could be used as a first step toward creating a sustainable economic system that would appropriately value the cost of environmental damage and positively affect consumption.

Though I have sought to show how the basic elements of the proposal would accomplish this aim, further work is needed. The proposal would need greater elaboration than is possible here to address concerns that will undoubtedly arise in the details.

Additionally, a number of important considerations have been omitted from this discussion due to space considerations. These include the issue of sinks, adaptation of vulnerable countries to climate change, accountability and enforcement, and dealing with perverse subsidies. These would all need to be addressed in any MEA, though I leave elaboration of these to others.

The problem of climate change demands an urgent response. However, we should take care to avoid designing a system that addresses climate without any regard for the wider problems of our unsustainable economic system. Only by adapting the structure as a whole – by internalizing economic costs – can we start down the path to a system that is truly sustainable. Otherwise, climate will only be the first in a series of global crises.

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