Ensuring US Competitiveness and International Participation

Trevor Houser, Peterson Institute for International Economics

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Chairman Waxman and Representative Barton, Subcommittee Chairman Markey and Represetnative Upton, thank you for inviting me to testify on this important and timely topic. My name is Trevor Houser and I am a visiting fellow at the Peterson Institute for International Economics. Last year the Peterson Institute, in partnership with the World Resources Institute (WRI), launched a multiyear initiative to examine the international economic, trade, and financial dimensions of energy and climate policy. It is a great pleasure to be able to share with the Committee our research on ways to address US competitiveness and to ensure international participation through the landmark climate legislation before you today.

The Impact of Climate Policy on US Competitiveness

Before assessing the impact on US economic competitiveness of efforts to address global warming, it is important to remember that letting that warming continue unabated is not economically sustainable. Economists estimate that the cost of projected temperature increases under a business-as-usual scenario would run between 5 and 20 percent of global GDP by 2100 (Cline 2009 and Stern 2007). Arresting this process will require imposing a price for greenhouse gas (GHG) emissions, which will raise the cost of energy for US consumers and the cost of production for US industry. At an economy-wide level these cost increases are fairly modest, roughly 1–2 percent of GDP, and pale in comparison to the price of doing nothing (Cline 1992 and Stern 2007). The cost of acting, however, will not be spread evenly. Households that rely on electricity generated from coal will experience larger cost increases than households powered by nuclear energy, renewable energy, or natural gas. And heavy industries that consume large quantities of energy will see their economics change more significantly than light manufacturing and services.

From an environmental standpoint, this is the intended outcome of legislation to reduce emissions. By raising the price of high-carbon products and sources of energy, market-based climate policy creates an incentive for investment in new technology and a move toward low-carbon alternatives. The impact of this transition on US economic competitiveness depends on our ability to:

1. *Level the playing field for high-carbon industries*: Ensure that imposing a price for carbon in the United States does not place American firms at unfair disadvantage vis-à-vis international competitors.

2. *Capture opportunities in low-carbon technology*: Develop new products and services that help households and firms reduce energy demand and GHG emissions.
3. *Reduce dependence on fossil fuel imports*: Save some of the $450 billion that the United States spends purchasing petroleum from abroad each year.
4. *Catalyze improvements in productivity*: Turn an incentive for improving energy efficiency into an opportunity to invest in increased productivity more broadly.

As this hearing is primarily concerned with the impact of climate policy on carbon-intensive manufacturing, I will focus my comments on ways to ensure these firms are competing on a level playing field. It is important to keep in mind, however, that this is only one element of how the transition to a low-carbon economy will impact US competitiveness.

Addressing Leakage in Domestic Legislation

As outlined in its discussion draft form, the American Clean Energy and Security Act of 2009 would reduce US greenhouse gas emissions in line with levels needed globally to avoid catastrophic climate change and would put the United States in a leadership position in international climate negotiations. But as the outcome of those negotiations is unclear, US legislation must seek to ensure that taking aggressive steps to reduce emissions at home does not force US industry to migrate abroad, undermining the effectiveness of domestic climate policy in the process.

Industries at risk of "leakage" of jobs and emissions are those exposed to international trade and for which pricing carbon will significantly raise production costs. A limited number of industries, accounting for 0.3 percent of US employment and 1.4 percent of US economic activity, fit this bill, making it a manageable and affordable problem to solve with allowance revenue under an economy-wide cap.[1] The European Union adopted this approach, both in phase II of their Emissions Trading System (ETS), which runs until 2012, and phase III, from 2013 to 2020. Emission allowances are provided free to carbon-intensive, trade-exposed industry to cover both the direct costs (greenhouse gasses emitted from the facility itself) and indirect costs (greenhouse gasses emitted in the generation of electricity consumed by the facility) associated with climate policy.

The Inslee-Doyle Output-Based Rebating (OBR) proposal included in Title IV of the American Clean Energy and Security Act of 2009 improves upon the European approach by rebating only the costs associated with actual production on an ongoing basis, rather than compensating companies for past output. This addresses a key concern surrounding the use of free allowances to prevent emissions leakage: that companies will make windfall profits by selling allowances received for free on the market, rather then using them to offset future carbon-related production costs. Title IV goes a step further and issues allowances based on industry-wide performance benchmarks. This creates an additional incentive for firms to invest in new, energy-efficient

[1] This figure is based on an assessment of industries at a 6-digit NAICS level, and thus identifies a more targeted set of vulnerable industries than my coauthors' and my analysis in *Leveling the Carbon Playing Field: International Competition and US Climate Policy Design* (2008).

technology and ensures that those who do so will not be put at a disadvantage vis-à-vis foreign competitors, either in domestic or export markets, as a result of US emission limits.

Who Is Covered and How Much Does it Cost?

Updating the analysis my colleagues at WRI and I published last year in *Leveling the Carbon Playing Field: International Competition and US Climate Policy Design*, I have included in this testimony an assessment of which industries, at a 6-digit NAICS level, would qualify for allowances under Title IV of the American Clean Energy and Security Act of 2009 and the share of overall emission allowances that would be required. To conduct this analysis I used the most recent data available from the sources explicitly listed in the bill. Energy-intensity is measured using the 2006 American Survey of Manufacturers (www.census.gov/mcd/asmhome.html). Trade-intensity is measured using 2006 data from the US International Trade Commission (www.usitc.gov). Greenhouse gas–intensity is the most difficult metric to calculate with existing data. Where available, I use emission estimates from the Energy Information Administration's 2002 Manufacturing Energy Consumption Survey (www.eia.doe.gov/emeu/mecs/). For other industries, I estimated the GHG-intensity of direct fuel purchases reported in the American Survey of Manufacturers using the direct use tables from the Bureau of Economic Analysis's benchmark 2002 input-output tables (www.bea.gov/industry/*)* and converted them to physical units using energy price data from the Energy Information Administration. Estimates for process emissions are from the EPA's Greenhouse Gas inventory. GHG-intensity was calculated using a $30 per ton of CO_2 price.

Using both the energy-intensity and GHG-intensity criteria described in the bill, I estimate that 35 industries would qualify for allowance rebates covering direct and indirect emissions (figures 1 and 2 and table 1). Of these, 26 are manufacturing industries, 4 are mining industries, and 5 are agricultural industries. It is not clear from the language in the bill whether nonmanufacturing industries were intended to be covered, but the criteria open the door for their inclusion. The economics of mining and agriculture are significantly different from manufacturing, with resource endowments driving investment decisions more than differences in carbon costs. As such, I would recommend that the committee limit "presumptively eligible sectors and subsectors" to those in manufacturing and require agriculture and mining to demonstrate a need for inclusion through administrative determination.

All told, the 35 industries listed in table 1 accounted for 9.4 percent of US emissions in 2006 (including direct, indirect, and process emissions). Covering 85 percent of these emissions through rebates would require 11.2 percent of total allowances in 2014, if production and efficiency levels stay where they are today.

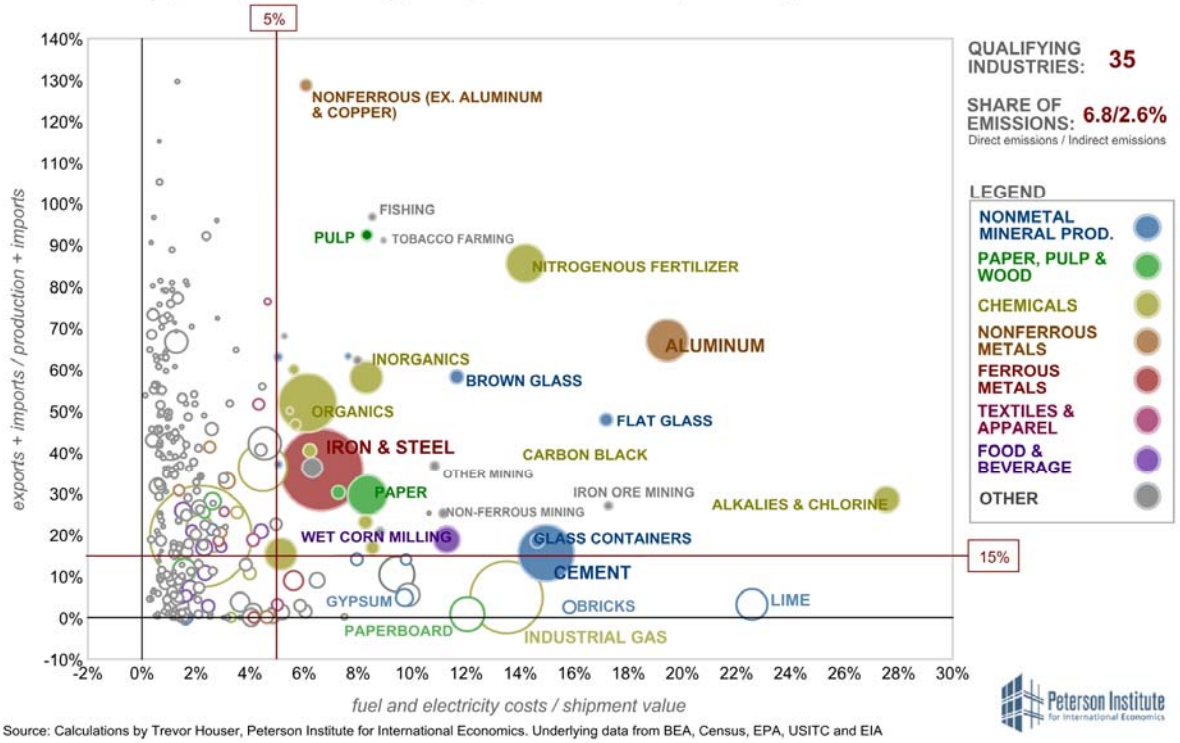
Is Output-Based Rebating Sufficient?

As currently structured, I believe the output-based rebating provisions in Title IV of the American Clean Energy and Security Act of 2009 would effectively guard against emissions leakage while maintaining an incentive for firms to invest in cleaner technology. If this is the case, trade measures should not be required so long as output-based rebating is in place. Indeed, if trade measures were imposed on top of output-based rebates, US-produced goods would be

treated more favorably than imports, a violation of our trade commitments and a poor precedent for other countries. The question then is how, over the long term, to transition from domestic rebates to a multilateral approach. Here trade policy can play an important role.

Figure 1: ACESA Energy-Intensity Criteria

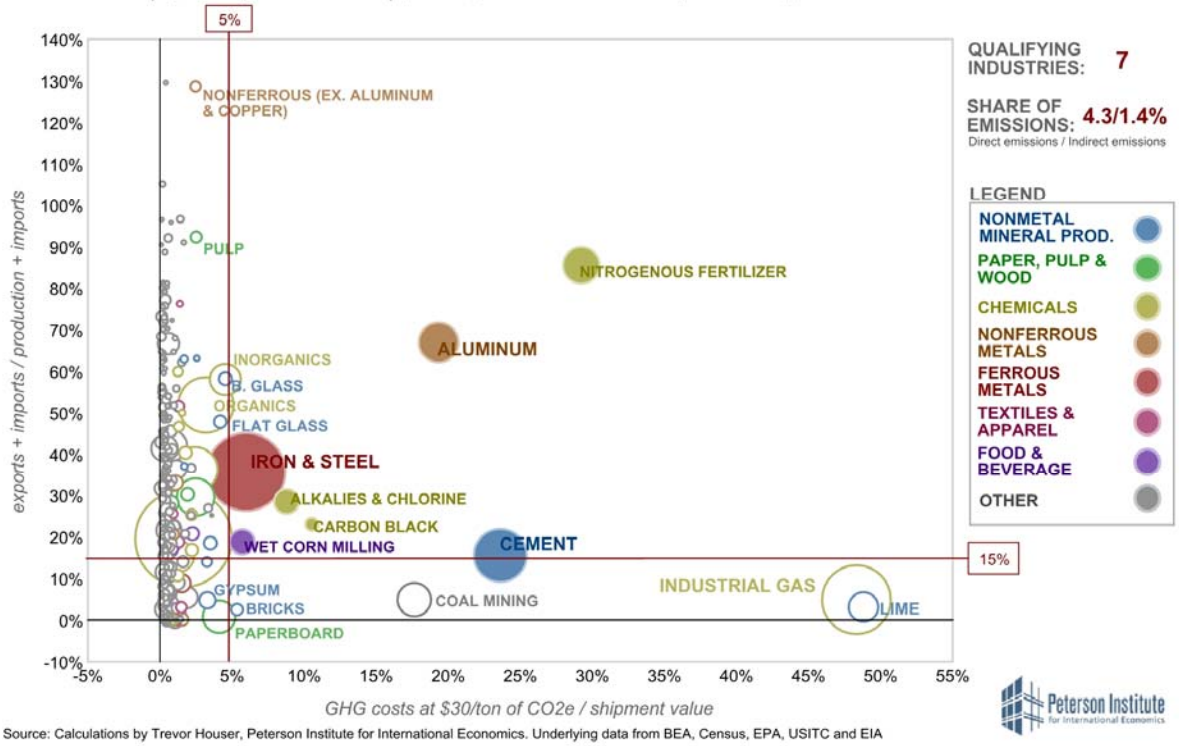
Trade-intensity (Y-axis), GHG-intensity (X-axis) and CO2 emissions (circle size), 2006



Source: Calculations by Trevor Houser, Peterson Institute for International Economics. Underlying data from BEA, Census, EPA, USITC and EIA

Figure 2: ACESA GHG-Intensity Criteria

Trade-intensity (Y-axis), GHG-intensity (X-axis) and CO2 emissions (circle size), 2006



Source: Calculations by Trevor Houser, Peterson Institute for International Economics. Underlying data from BEA, Census, EPA, USITC and EIA

Table 1: Qualifying Industries under Title IV of the ACESA 2009

Industry	GHG (million tons CO_2e)				Energy-Intensity	GHG-Intensity	Trade-Intensity
Description	Energy	Process	Indirect	Total	Energy costs / shipment value	GHG costs / shipment value	Exports + imports / production + imports
Alkalies and chlorine manufacturing	6.2	4.2	8.2	18.6	27.5%	8.8%	28.5%
Alumina refining and primary aluminum production	4.9	6.4	36.7	48.0	19.4%	19.3%	67.0%
Iron ore mining	0.7	0.0	1.2	2.0	17.3%	3.3%	26.9%
Flat glass manufacturing	2.9	0.7	1.1	4.7	17.2%	4.2%	47.9%
Cement manufacturing	30.8	45.7	8.2	84.7	15.0%	23.6%	15.5%
Glass container manufacturing	2.7	0.0	2.5	5.2	14.6%	3.5%	18.5%
Nitrogenous fertilizer manufacturing	10.1	28.0	2.3	40.4	14.2%	29.2%	85.5%
Other pressed and blown glass and glassware manufacturing	3.6	0.0	1.5	5.2	11.6%	3.9%	58.2%
Wet corn milling	14.5	0.0	4.4	18.9	11.3%	5.7%	18.8%
Copper, nickel, lead, and zinc mining	0.6	0.0	1.2	1.8	11.2%	2.2%	25.1%
Other nonmetallic mineral mining and quarrying	1.1	0.0	1.1	2.3	10.8%	2.2%	36.7%
Other structural clay product manufacturing	0.2	0.0	0.0	0.3	10.6%	3.6%	25.1%
Tobacco farming	0.4	0.0	0.2	0.7	8.9%	1.6%	91.0%
Gold, silver, and other metal ore mining	0.9	0.0	1.2	2.1	8.8%	1.7%	20.7%
Mineral wool manufacturing	2.2	0.0	2.5	4.7	8.5%	2.2%	16.8%
Fishing	1.5	0.0	0.0	1.5	8.5%	1.4%	96.7%
Paper and newsprint mills	24.4	0.0	17.9	42.3	8.3%	2.5%	29.5%
Pulp mills	2.7	0.0	0.8	3.6	8.3%	2.5%	92.3%
All other basic inorganic chemical manufacturing	7.2	5.1	16.7	29.0	8.3%	4.5%	58.1%

Carbon black manufacturing	4.9	0.0	0.4	5.3	8.3%	10.5%	23.0%
Cotton farming	1.1	0.0	0.6	1.7	8.0%	1.5%	62.1%
Ceramic wall and floor tile manufacturing	0.7	0.0	0.3	1.0	7.6%	2.5%	63.1%
Reconstituted wood product manufacturing	1.6	0.0	3.5	5.0	7.3%	1.9%	30.2%
Iron and steel mills and ferroalloy manufacturing	91.8	56.6	37.3	185.7	6.6%	6.0%	35.7%
Grain farming	8.6	0.0	2.5	11.2	6.3%	1.2%	36.3%
Artificial and synthetic fibers and filaments manufacturing	2.7	0.0	2.3	5.0	6.2%	1.8%	40.4%
Other basic organic chemical manufacturing	68.5	5.9	17.1	91.5	6.1%	3.2%	51.9%
Primary nonferrous metal (except copper and aluminum)	0.9	0.8	2.2	4.0	6.1%	2.5%	128.7%
Synthetic dye and pigment manufacturing	1.1	0.0	1.9	3.0	5.7%	1.3%	46.7%
Synthetic rubber manufacturing	1.7	0.0	1.2	2.9	5.6%	1.2%	59.9%
Carbon and graphite product manufacturing	0.5	0.0	0.8	1.3	5.5%	1.5%	50.1%
Tree nut farming	0.3	0.0	0.5	0.8	5.3%	1.1%	68.0%
Petrochemical manufacturing	19.3	3.6	5.3	28.2	5.1%	1.3%	15.3%
Refractory manufacturing	0.9	0.0	0.4	1.3	5.0%	1.7%	37.1%
Pottery, ceramics, and plumbing fixture manufacturing	1.1	0.0	0.6	1.7	5.0%	1.7%	63.0%
Emissions	323.4	157.0	185.0	665.4			
Share of US total in 2006	*8.6%*	*48.9%*	*7.9%*	*9.4%*			
Amount rebated	274.9	133.5	157.2	565.6			
Share of 2014 allowances	*5.44%*	*2.64%*	*3.11%*	*11.18%*			

Source: Calculations by Trevor Houser, Peterson Institute for International Economics. Underlying data from BEA, Census, EPA, USITC, and EIA

Addressing Leakage through International Agreements

While OBR is an effective guard against leakage of jobs and emissions, it should be seen as a temporary measure. OBR creates an incentive for firms to invest in cleaner production methods by rebating 85 percent of average compliance costs in a given industry. Firms that perform better than average see a larger share of their total costs rebated. But in offsetting compliance costs that can not be mitigated through efficiency investments, OBR prevents an increase in the price of carbon-intensive goods like aluminum, steel, and cement. This is by design. In the face of international competition that does not face comparable compliance costs, consumer will respond to higher product prices by switching to imports rather than less carbon-intensive domestic substitutes. Meeting long-term emission reduction goals at affordable prices will require taking advantage of the full host of abatement opportunities in the economy, including product switching from more carbon-intensive to less carbon-intensive goods.

Our long-term goal, therefore, should be to reach an international agreement where foreign producers face similar costs to their counterparts in the United States and where the price for carbon is passed on to consumers.

Providing Flexibility for an International Agreement

In Bali, Indonesia in 2007 the 192 signatories to the UN Framework Convention on Climate Change (UNFCCC) agreed to negotiate a new global climate agreement to take effect in 2013. Renewed engagement by the United States, and a willingness of large developing countries to

follow US leadership with commitments of their own, has injected fresh optimism into international negotiations set to conclude in Copenhagen this December.

There is an emerging consensus that to avoid the most catastrophic impacts of a warming world, the international community will need to reduce emissions 50 percent below 1990 levels by 2050. The most economically efficient way to achieve these cuts would be through a uniform price for carbon worldwide, either through a global carbon tax or cap-and-trade system. However, given different level of economic development, historic responsibility, and domestic politics, commitments to reduce emissions will vary by country. As part of the Bali Action Plan, developing countries agreed to take "nationally appropriate mitigation actions" as part of a global deal but not the same level of reductions as their rich-world peers (United Nations 2007). Even among developed countries accepting binding limits, targets will likely differ. For the third phase of its emissions trading scheme, the European Union plans to reduce emissions 20 percent below 1990s levels by 2020, or 30 percent if a global agreement is reached. The American Clean Energy and Security Act of 2009 would reduce emissions 20 percent below 2005 levels by 2020, or 5 percent below 1990 levels.

Differences in commitment levels, and in the type of policies adopted to reduce emissions, means that, at least for an interim period, carbon prices will vary, not just between the United States, China, and India, but between the United States, Europe, and Canada. From an environmental standpoint, this is just fine. Within the context of a global target of a 50 percent below 1990s levels reduction by 2050, the international community has flexibility in how it chooses to share the burden, and individual countries have flexibility in choosing which policy approach to take so long as the numbers add up at the end of the day. Indeed, given the magnitude of the challenge, both in reaching agreement between countries and passing legislation within countries, such flexibility will be critical in getting to a global deal. The resulting variation in carbon prices, however, exposes carbon-intensive industry to the risk of emissions leakage.

Over time, differences in national carbon prices can be reconciled by linking domestic cap-and-trade systems to create a global carbon market or harmonizing domestic carbon taxes internationally with side payments to less-developed countries. Yet the political consensus and supporting infrastructure required to move to a single global carbon price will likely take at least two decades to build. In the interim, we need to look for multilateral solutions to carbon leakage in a world of differing carbon costs.

Developing Solutions for Traded Goods

The fact that only a limited number of industries are vulnerable to emissions leakage means there is plenty of scope for a multilateral solution that maintains the principle of "common but differentiated" responsibilities. While asking developing countries to impose the same carbon constraint on their citizens as Europe or the United States is a nonstarter, asking that they impose comparable costs or standards on a handful of internationally traded industries is a reasonable request. This could come in the form of an explicit agreement on key sectors or commitments by major producers to impose comparable costs or standards as part of their Nationally Appropriate Mitigation Actions.

A deal reached among major producers of carbon-intensive goods on a multilateral approach to emissions leakage would help ensure that international trade does not undermine the goals of climate policy and that unilateral efforts to guard against emissions leakage do not undermine the global trading system. A multilateral approach to key sectors hammered out at the UNFCCC could be supported by a plurilateral code at the World Trade Organization (WTO) establishing principles for addressing climate costs in international trade. My colleagues at the Peterson Institute have recently published a study outlining what such a code could look like (Hufbauer, Charnovitz, and Kim 2009). If differences in carbon prices or standards at a sector level remain important for political or equity reasons, a WTO code could guide countries in adjusting their domestic carbon prices at the border and create a pathway for phasing out domestic rebates and supports.

US legislation can play a useful role by setting guidelines for what type of agreement on these key industries would be a sufficient replacement for domestic cost-containment mechanisms like output-based rebating. The American Clean Energy and Security Act of 2009 takes an important step in this direction through the Annual Review for Elimination. In addition, I would recommend that the Committee consider including more specific guidance to US negotiators on the importance of developing an international mechanism for addressing emission leakage within the context of a global deal. If the US delegation is successful in developing such a mechanism sooner than 2020, I would suggest allowing for an early phase-out of domestic rebates. To garner industry support for a multilateral approach, it is important to have a definite end-point for the provision of free allowances domestically. Unilateral trade measures could serve as a backstop against emissions leakage if a suitable multilateral approach has not been reached by the time domestic rebates are eliminated.

Creating Incentives for International Participation

What tools does the United States have to elicit participation in an international climate agreement broadly and multilateral approaches to emissions leakage specifically? It is important here to keep in mind that despite new-found interest in Washington in addressing climate change, we are late to the party and still have a lot of catching up to do. Europe has test-run an emissions trading scheme and adopted aggressive targets for the period of 2012 through 2020. Australia recently joined the Kyoto Protocol and is in the process of crafting its own domestic climate policy. And larger emerging economies like China, Brazil, and Mexico are taking significant action to curb their growth in emissions. That said, if the United States is going to pass binding domestic climate legislation to meet our end of the bargain, it is natural to want some insurance that actions from other countries will be enough to get us to our global target.

Trade measures that are aimed at adjusting differences in carbon prices at the border (such as those outlined in Part 2 of Title IV of the American Clean Energy and Security Act of 2009) can be effective tools to prevent emissions leakage but provide little leverage over the domestic policy of foreign countries. While exports of labor-intensive goods like electronics, toys, and apparel are important sources of growth in emerging economies, exports of carbon-intensive goods like steel, aluminum, and cement are not. Most of the demand for those goods comes from developing countries themselves to feed the construction boom resulting from mass urbanization.

China, for example, accounts for 38 percent of all steel production worldwide. Yet only 12 percent of this is exported and less than 1 percent shows up in the United States. All carbon-intensive exports from China to the United States combined account for 0.1 percent of the Chinese GDP, not much of a stick in comparison to the cost of climate policy.

Broader trade sanctions, rather than adjustments based on the carbon-content of imports, could play a role in enforcing a global agreement, if agreed upon multilaterally and accompanied by a new WTO code along the lines called for by Hufbauer, Charnovitz, and Kim (2009). Until then, there are a number of carrots we can use to help encourage other nations, developing countries in particular, to join in a global agreement. The most important, by far, is committing to significant emission reductions at home, along the lines called for in the bill before you today. The American Clean Energy and Security Act of 2009 also includes a number of specific provisions that will be very useful in reaching an international agreement, including the use of international offsets in Title VII and the adaptation assistance in Title IV. Europe has chosen to take on more aggressive targets if other countries join in a global deal, an approach the United States could choose to emulate. Washington could also think more broadly and offer to discuss providing countries like China and India with a greater voice in global economic governance if they agree to play a leadership role on global climate change.

When it comes to an international agreement on trade-exposed, carbon-intensive industries specifically, we have another piece of leverage: the allowance value required to hold our industries harmless in the absence of such a multilateral approach. Reaching agreement between major producers of carbon-intensive goods on imposing comparable costs or allowing individual countries to adjust their domestic costs at the border would enable us to phase out domestic rebates. If large emerging economies like China and India agree to bear the costs of greening their industry, we could use that revenue to assist in mitigation activities in nontradable sectors like buildings, transport, and agriculture.

Conclusion

It is critical that we get the economic issues right in crafting a domestic and international approach to climate change. Arresting global warming will be a multigenerational process requiring sustained political support. The lessons of trade liberalization teach us that generating and maintaining this support will require an understanding of and adequate preparation for the distributional effects climate policy will have on the US economy. This goes beyond ensuring that carbon-intensive industries are competing on a level playing field. Climate policy is designed to move consumers away from high-carbon goods and services toward low-carbon alternatives. That means that over time certain products and production methods will become obsolete while others will be created. Managing this transition fairly and ensuring that US firms and workers are positioned to take advantage of the economic upside climate policy offers will be key to its long term success.

At the international level, the transition to a low-carbon economy must account for the development needs of low-income countries and address the leakage concerns of advanced economies. No single country was the ability to solve this problem on its own or the leverage to force other countries to act if they do not see it as in their interest to do so. A multilateral

approach will be required and the legislation before you today takes an important step in that direction.

Thank you for the opportunity to testify before you today and I look forward to your questions.

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