

## **U.S. Climate Change Policy and International Trade Policy Intersections: Issues Needing Innovation for a Rapidly Expanding Agenda**

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### **Abstract**

Climate change issues and international trade, investment and technology transfer issues have intersected in diverse institutional contexts and at several levels of governmental activities to form a new joint agenda. The purpose of this paper is to: (1) advance understanding of the joint agenda by identifying the specific issues that have emerged, their national and international contexts, and their current status in policymaking processes; and (2) present recommendations that will be beneficial to the development of both climate change mitigation and international trade, investment and technology transfer - and the associated international institutional arrangements. The specific factual focus is on recent developments in the U.S., but many of the issues have also arisen in other national and international policymaking contexts. The following intersections have been identified:

- (1) offsetting border measures that address international competitiveness and “free rider” concerns;
- (2) tariffs and non-tariff barriers to trade, investment and technology transfer of climate-friendly goods and services;
- (3) issues concerning the international aviation and maritime shipping industries;
- (4) programs that promote exports, foreign direct investments and technology transfers, especially to emerging economies;
- (5) international climate change technology cooperation agreements;
- (6) program budgeting;
- (7) subsidies for renewable energy and energy efficiency goods and services;
- (8) product labeling and standards;
- (9) government procurement; and
- (10) international trade, investment and technology transfer issues associated with Clean Development Mechanism (CDM) and Joint Implementation (JI) projects.

These are not mutually exclusive categories, nor are they necessarily collectively exhaustive. All but the last one have already appeared on the U.S. government agenda. All are - or may soon be - on the agendas of the multilateral climate regime and/or the multilateral trade regime. The paper is structured to provide breadth of coverage to convey the diversity of issues reflected in the ten intersections, and also to provide in-depth coverage of selected issues to convey their complexity.

\* The paper is an expansion and update of Thomas L. Brewer, “U.S. Climate Change Policies and International Trade Policies: Intersections and Implications for International Negotiations,” which was initially posted to [www.usclimatechange.com](http://www.usclimatechange.com) on 27 November 2007. The list of five intersections in that paper has been increased to ten in this revised version by the addition of: program budgets, subsidies, standards and labeling, government procurement, and CDM and JI projects. This version of the paper is based on circumstances as of 25 January 2008, following the release of the European Commission’s climate change proposals, before any related actions in the 2<sup>nd</sup> session of the 110<sup>th</sup> U.S. Congress and before the President’s State of the Union speech.

*“The reduction of tariff and non-tariff barriers for low-carbon goods and services, including within the Doha Development Round of international trade negotiations, could provide further opportunities to accelerate the diffusion of key [climate friendly] technologies.” The Economics of Climate Change: The Stern Review, 2006, p. xxv.*

*“One way to look at the Kyoto Protocol - and whatever global agreements will follow - is as an investment and trade agreement.... [A]n important hidden imperative behind Kyoto is the creation of an open global market in environmental technologies....[W]herever possible, restrictive national rules on investment or services trade that prevent this transfer of expertise and technology must be removed.” E.U. Trade Commissioner Mandelson, speech on 18 December 2006.*

*“[T]he relationship between international trade — and indeed the WTO — and climate change, would be best defined by a consensual international accord on climate change that successfully embraces all major polluters.... Trade, and the WTO toolbox of trade rules more specifically, can - at best - offer no more than part of the answer to climate change. It is not in the WTO that a deal on climate change can be struck, but rather in an environmental forum, such as the United Nations Framework Convention on Climate Change. Such an agreement must then send the WTO an appropriate signal on how its rules may best be put to the service of sustainable development; in other words, a signal on how this particular toolbox of rules should be employed in the fight against climate change.” Pascal Lamy, Director-General, speech at the Informal Trade Ministers' Dialogue on Climate Change in Bali on 8-9 December 2007.*

## **1. Context, Purpose and Scope of the Study**

The quotations above demonstrate that climate change and trade agendas have already intersected at the international level in the context of E.U. and WTO policymaking. In addition, developments within the United States in government climate change policymaking and international trade policymaking have also already led to intersections of these two policy domains, which had previously been independent of one another. The intersections have become prominent in Congress concerning policymaking on future climate change policies as well as in policies already being implemented by the executive branch of the government. The intersections, furthermore, reveal important tendencies in the institutional and attitudinal contexts of U.S. climate change policymaking, and they will have significant consequences for U.S. policies in negotiations on the future of the international climate change system and international trade system.

The purpose of this paper is to (1) advance understanding of the joint climate-trade agenda by identifying the specific issues that have emerged, their national and international contexts, and their current status in policymaking processes, and (2) present suggestions that will be beneficial to both climate change mitigation and international trade, investment and technology transfer - and the associated international regimes. The paper includes international investment and technology transfer policies, along with trade in goods and services, because they are all highly interdependent types of international business transactions. The term “trade” is thus used in the title and elsewhere in the paper as a short-hand expression that includes investment and technology transfer, as well as trade in goods and services.

The paper focuses on the following kinds of climate-trade intersections, which have already appeared in tangible form on the U.S. agenda:

- offsetting border measures that address international competitiveness concerns;
- tariffs and non-tariff barriers to trade, investment and technology transfer of climate-friendly goods and services;
- international aviation and maritime shipping industry issues;
- programs that promote exports, foreign direct investments and technology transfers, especially to emerging economies;
- international climate change technology cooperation agreements;
- program budgeting;
- subsidies for renewable energy and energy efficiency goods and services;
- product labeling and standards issues; and
- government procurement.

In addition, it briefly discusses:

- international trade, investment and technology transfer issues associated with Clean Development Mechanism (CDM) and Joint Implementation (JI) projects (which are not yet on the U.S. agenda because it does not participate in the Kyoto Protocol).

By including a total of ten areas of intersection, the paper reveals the wide diversity of issues that have emerged. At the same time, in-depth analyses of selected issues are intended to convey the complexity of the issues.

### **Review of the literature**

There has been interest among scholars and other specialists since the late 1990s in the potential interactions between the emerging international climate regime and the established international trade regime. Early studies include those by Hoerner and Müller (1996), Petsonk (1999), Sampson (1999), Werksman (1999), Werksman and Santoro (1999), and Zhang (1998). A specific concern of these and other early studies was the identification of potential win-win arrangements and avoidance of lose-lose scenarios. In addition to the items cited above, also see Assuncao (2000); Brack, Grubb and Windram (2000), Brewer (2003; 2004), Charnovitz (2003, 2005), Müller (2002), National Board of Trade of the Government of Sweden (2004), Sampson (2000), Tarasofsky (2005), Werksman, Bauman and Dubash (2001) and Zhang (1998). For broader analyses that encompass multilateral environmental agreements in general and their interactions with the WTO, see Palmer and Tarasofsky (2007).<sup>1</sup>

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<sup>1</sup> As I have suggested elsewhere (Brewer, 2004b), there are four terms that encapsulate the kinds of generic environmental policy intersections with trade and foreign direct investment (FDI): Environment Related Trade Measures (ERTMs), Environment Related Investment Measures (ERIMs), Trade Related Environment Measures (TREM), and Investment Related Environment Measures (IREMs). For climate friendly goods and services, in particular, the following are examples: tariffs on biofuels (ERTMs), restrictions on FDI in wind turbine manufacture (ERIMs), subsidies for production of renewable fuels (TREM), government R&D subsidies for investments in pilot projects in carbon sequestration (IREMs).

The initial interest, however, was mostly about abstract and hypothetical possibilities, including both the possibilities for conflict and the possibilities for mutually supportive interactions. Developments in a variety of climate change and trade policymaking settings during the past few years have made many of these issues tangible and current. Now that there is an active joint climate-trade agenda - in the E.U., the U.S., other countries, and many international institutions - there has been a shift in studies of the joint agenda to a focus on more specific issues and ways to address them, particularly in the context of multilateral climate change and trade institutions.

Recent studies have generally been more empirical and/or more concerned with how to address specific current policy issues. A study at the World Bank (2008), for instance, has enriched the climate-trade literature by an extensive econometric analysis of the effects of national carbon taxes and energy efficiency measures on international trade patterns. A study for the E.U. (2007) has analyzed climate-trade issues for several energy-intensive sectors as well as international transportation issues, and a study for the European Parliament (2007) has developed a wide-ranging list of climate-trade issues for the attention of the E.U. institutions. A report from the (U.S.) National Foreign Trade Council (2007) has analyzed WTO-compatibility and other international trade law issues concerning pending climate change legislation in the U.S. Congress. Miller (2007) has also reviewed some of those issues. International competitiveness issues and how they can be addressed within the context of an emissions cap-and-trade system have been addressed by Kopp and Pizer (2007), Morgenstern (2007), and Morgenstern, et al. (2007).

In addition, studies by Sell, Sugathan, Gueye, Cheng and others at the International Centre for Trade and Sustainable Development (ICTSD, 2006) have focused on specific industries and issues concerning climate-trade intersections. Also see the several earlier econometric studies available in Böhringer and Löschel (2004). Brief analyses by Cosbey (2007a, 2007b, 2007c) of the International Institute for Sustainable Development (IISD) in Canada identifies areas where action could enhance the contributions of international trade and investment to climate change mitigation. Several articles focus again on the WTO-compatibility of climate change policies (Buck and Verheyen, 2001; Stoler, 2004; and Green, 2005 and 2006).

As a contribution to the literature on climate change-international trade intersections, the present paper emphasizes specific current and prospective policy issues on the *U.S. policymaking agenda and the domestic institutional policymaking context that shapes those policies*. Recent and prospective changes in domestic political conditions in the U.S., as well as the evolution of the international negotiating agendas for both climate change and trade, indicate the need for a detailed focus on U.S. policy intersections. The changing domestic political conditions include shifts in the party control of Congress and concomitantly increased legislative activity on climate change issues, the increasing responsiveness of business to climate change issues, the increasing public support for action on climate change, and the prospective changes in the administration in 2009. In addition, the domestic political conditions concerning trade issues, of course, also continue to evolve. Although the factual analysis of the paper principally concerns U.S. policymaking, much of the conceptual analysis as well as many of the facts pertain to other countries and the E.U. For these issues cannot, of course, be understood without reference to their international contexts.

## 2. Offsetting Border Measures that Address International Competitiveness and Free Rider Concerns<sup>2</sup>

The convergence of the climate change and trade agendas in the U.S. has been particularly noteworthy in GHG emissions cap-and-trade legislative proposals in Congress that would impose offsetting border measures on imports from targeted countries. Two of the many legislative proposals introduced during 2007 are relevant (see Annex I). One is Senate bill 1766, introduced by Senators Bingaman (Democrat from New Mexico) and Specter (Republican from Pennsylvania); the other is Senate bill 2191, introduced by Senators Lieberman (Independent-Democrat from Connecticut) and Warner (Republican from Virginia). The Lieberman-Warner bill (S. 2191) was reported favorably by the Senate Environment and Public Works Committee on December 5, 2007.<sup>3</sup>

If passed in their current form, these bills would require purchases of greenhouse gas emission allowances in order for imported goods to be allowed to enter the U.S. from countries that are not making satisfactory efforts to mitigate greenhouse gas emissions. The requirement for such purchases would be an alternative to offsetting border measures in the form of tariffs.

Abstractly, the underlying problem in the terminology of political economy is that there can be “free riders” on international agreements, in this case multilateral climate change agreements. The problem, in short, is that any given country can benefit from such an agreement without incurring the costs of participating in it. Firms may fear that their international competitive position is being undermined by lower energy prices in non-participating countries. In the U.S., these issues have become salient in regard to emerging economy countries (especially Brazil, China, and India).<sup>4</sup>

In the E.U., the issues have arisen from time to time during the past several years in regard to U.S. non-participation in the Kyoto Protocol. The emphasis in the public discussions within the E.U. was initially on the possible imposition of offsetting tariffs, though the European Parliament’s resolution (2005/2049) uses the generic term “border adjustment measures.”<sup>5</sup> The Commission’s reaction to these measures was initially to oppose them on the grounds that they risked exacerbating trade relations with the United States, particularly at a time when trade relations were already strained and when trans-Atlantic relations more generally were unusually conflicted over a broad range of issues. In addition, there have been concerns that such a measure

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<sup>2</sup> This section is based in part on excerpts from Brewer (2007a).

<sup>3</sup> The committee vote was 11 in favor and 8 opposed, with all 10 Democrats voting in favor, and 8 of 9 Republicans voting against (Sen. Warner being the exception).

<sup>4</sup> There is already a sizable and rapidly increasing literature on international competitive issues. See especially World Bank (2008) and the several items in a special edition of the journal *Climate Policy* (Volume 6, Issue 1, 2006) edited by Grubb and Neuhoff. Some studies have been focused on the effects of the EU ETS on European firms; a Carbon Trust (2008) study focuses on the effects of the EU ETS on UK industries. Others have been addressing similar issues in the event of a U.S. cap-and-trade system (see especially Morgenstern, 2007; and Morgenstern, et al., 2007). A Chatham House study by Cosbey and Tarasofsky (2007) provides an overview of the issues. Two key factors that condition the international competitive issues are: whether the firms are in industries that are directly covered by cap-and-trade allowances, and the extent they produce tradable products.

<sup>5</sup> The European Parliament’s resolution (2005/2049) “... [c]alls on the Commission to take seriously into account the ‘free-rider’ problem in the area of climate change mitigation; calls on the Commission and the Member States to investigate the possibility of adopting border adjustment measures on trade in order to offset any short-term competitive advantage producers in industrialised countries without carbon constraints might have....” There is an extensive “Report on trade and climate change” of the European Parliament (2007a, 2007b).

would undermine support in the U.S. among those political and business circles that have been hoping for increased E.U.-US cooperation on climate change issues. There have also been concerns that such a tariff might be challenged in a WTO dispute settlement case, and the outcome of such a case would inevitably be uncertain. However, before leaving office in 2007, French President Chirac and Prime Minister de Villepin suggested again that such measures be undertaken, and President Sarkozy subsequently expressed interest in the idea soon after his election.

In November 2007 - in advance of the Bali climate change conference - the issue was again the subject of attention within the Commission and Parliament, and among industry and environmental groups. E.U. Enterprise Commissioner Verheugen suggested that the Commission was more favorably inclined to address the issue through sectoral agreements, including perhaps voluntary global industry agreements - a position that has been supported by at least some industry and environmental organizations (see especially, Financial Times, 2007; and EurActive, 2007b).

However, just before and after the release of the Commission's proposals for extension of the Emissions Trading Scheme (ETS) on 23 January 2008, there was a specific and salient resurgence of interest. Commission President Barroso explicitly mentioned the possibility in a speech (EC Commission, 2008a). The possibility of such action is left open for future consideration, as is the possibility of granting all allowances free to energy-intensive industries (ICTSD, 2008a). *The focus of discussion, however, has shifted away from tariffs to importers' purchases of emission credits.*

At the same time, interest in offsetting border measures in the U.S. has been increasing, particularly in the Senate in the aftermath of a favorable committee report on S. 2191, "America's Climate Security Act," introduced by Senators Lieberman and Warner. That bill includes provisions that would require U.S. importers to purchase "international reserve allowances" to offset low energy costs for covered imported goods coming from countries that have not taken adequate measures to mitigate greenhouse gas emissions. Its provisions are similar in many respects with those of another prominent climate change bill, S. 1766, in which Title V requires reviews every five years of "whether each of the 5 largest trading partners"<sup>6</sup> of the U.S. has taken "comparable action" to limit GHG emissions. Table 1 provides detailed side-by-side comparisons of the two bills.

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<sup>6</sup> The bill refers to "each of the 5 largest trading partners" of the United States. In 2006, the top five U.S. trade partners, *as measured by total trade (imports plus exports) of goods*, were: Canada, China, Mexico, Japan and Germany ("US Foreign Trade Statistics" of the U.S. Census Bureau, accessed at [www.census.gov/foreign-trade/statistics/highlights/top/top0706.html](http://www.census.gov/foreign-trade/statistics/highlights/top/top0706.html) on 31 August 2007). In its present form, the bill provides for the first such review to be completed by January 1, 2016, from an inter-agency group to be established by January 1, 2013, by which time the trade partner rankings could obviously be different.

**Table 1. Border Measures on Imports to Address International Competitiveness and Free Rider Issues, as Contained in Pending U.S. Senate Climate Change Bills: Side-by-Side Comparisons of Provisions in S. 1766 and S. 2191 (November 2007)**

<b>Bill Number Title</b>  <b>Principal Sponsoring Senators</b>	<b>S. 1766 Low Carbon Economy Act Bingaman (Dem) &amp; Specter (Rep)</b>	<b>S. 2191 America’s Climate Security Act Lieberman (Ind-Dem) &amp; Warner (Rep)</b>
<b>Key Title Number and Name</b>  <b>(page length)</b>	Title V - Periodic Review and International Leadership (31)	Title VI - Global Effort to Reduce Greenhouse Gas Emissions (19)
<b>Sections</b>	501 - Executive Branch and Congressional Review of Program 502 - International Reserve Allowance Requirements	6001 - Definitions 6002 - Purposes 6003 - International Negotiations 6004 - Interagency Review 6005 - Presidential Determinations 6006 - International Reserve Allowance Program 6007 - Adjustment of International Reserve Allowance Requirements
<b>Core similarity:</b> U.S. importers must buy “international reserve allowances” to offset lower energy costs of manufacturing covered goods coming from covered countries	502(f)	6006(c)
<b>Stated Purpose</b> (similar): protect against foreign countries’ undermining U.S. objective of reducing GHG emissions	502(b)	6002
<b>Covered foreign countries:</b> Countries are <i>excluded</i> from coverage if they (virtually identical): >have taken “comparable action” to U.S. >are “least-developed” >have GHG emissions below <i>de minimis</i> level (0.5% of world emissions)	502(a)(4), 502(f)(3)(B)(ii)	6001(4), 6001(6), 6006(b)(3), 6006(c)(4)(B)
<b>Comparable action</b> by foreign country (virtually identical): Comparable in effect, as determined by U.S. President, taking into account level of development	502(a)(2)	6001(2)
<b>Covered goods</b> (similar): Identified by President/EPA Admin., by rule, as GHG intensive good (primary product) that is closely related to good whose cost of production in U.S. is affected by the Act	502(a)(5)	6001(5)
<b>Primary products</b> (virtually identical): Iron, steel, aluminum, cement, bulk glass, or paper; <i>or</i> other manufactured product sold in bulk for a further manufacture <i>and</i> manufacture of which generates GHG emissions comparable, on emissions-per-dollar basis, to those produced in U.S.	502(a)(12)	6001(10)
<b>Ref. to international rule of origin</b>	502(a)(7)	--

<b>International Reserve Allowances</b>	502(f)	6006
Separate from domestic system (similar)	502(f)(4)(A)	6006(a)(2)
Price (similar): President/EPA Admin. establishes, by rule, methodology for determining prices for each year	502(f)(4)(A)(iii)	6006(a)(3)(A)
Methodology/formula for calculating international reserve allowance requirement (virtually identical): President/EPA Admin. determines on per unit basis for each covered good of each covered country	502(f)(6)(A)	6006(d)(1)
<b>Schedule</b>	502(f)(1)(A)	6006(c)(1)
Beginning date of International Reserve Allowance system for importer declarations	January 1, 2020	January 1, 2019

Sources: Compiled by the author from the texts of the bills as reported in [www.loc.thomas.gov](http://www.loc.thomas.gov), accessed on 18 October 2007.

In both bills, the proposal is to require U.S. importers in some circumstances to *purchase GHG emission allowances*. Such a measure could be less vulnerable than a tariff to challenge in the WTO, because it could more clearly be considered an environmental measure that would qualify as an exception under GATT Article XX(g), which allows measures “relating to the conservation of exhaustible natural resources.” The offsetting border provisions in both bills have been carefully crafted to avoid - or survive if necessary - any challenges in the WTO dispute settlement process. There are provisions, for instance, that would require the U.S. government to enter into negotiations with foreign governments in an effort to resolve international competitiveness issues and in advance of any actual imposition of the allowance purchasing requirement.

As for the possibility of a challenge to such a provision in the dispute settlement process of the WTO, there is inevitably considerable complexity and uncertainty about the fate of any such dispute. For extensive analyses of these issues, see the testimony submitted to a Congressional committee by American Electric Power (2007) and the analysis by the National Foreign Trade Council (2007). Whereas the former reflects confidence about its WTO compatibility, the latter reaches the opposite conclusion. Further analysis may be able to resolve these differences and be incorporated into changes in the bill as it progresses through the legislative process.<sup>7</sup>

These provisions and many other technicalities of the bills are of course subject to revision in Congressional deliberations and in any negotiations that may occur between members of Congress and the President (current or future).<sup>8</sup> However, it is significant that there is already quite specific and extensive language formulated and under active consideration in the Congress. It is also noteworthy that there would be much flexibility in how the provisions of the bill would

<sup>7</sup> The author of the present paper has in progress a point-by-point comparison of the similarities and differences in the IBEW-AEP (2007) and NFTC (2007) analyses.

<sup>8</sup> During the consideration of the bill by the Senate Environment and Public Works Committee, there were two attempts to change the international reserve allowance provisions. One by Senator Inhofe would have changed the initial date for inaugurating that system from 2020 to 2012. The other by Senator Voinovich would have suspended the domestic cap-and-trade program as well as the international reserve allowance provisions in the event of a WTO decision that the international provisions were inconsistent with WTO rules. Both of these proposals were withdrawn with the understanding that the issues they raised would be reconsidered later in the legislative process. See Pew Center on Global Climate Change (2008) for additional information about the status and progression of the Lieberman-Warner bill in the Congressional legislative process.

be applied to particular circumstances and in the content of the implementing regulations. Further, negotiations would be sought with target countries before the import measures are implemented.

As of late January 2008, the prospects for these and the many other climate bills under consideration in the House and Senate were uncertain. However, whatever the outcome of votes on these bills and any Presidential action that might ensue, it is clear that there is much political support for some kind of border measure provision in climate legislation that includes a mandatory cap-and-trade system. Indeed, the proposal was first vetted jointly by one of the country's largest electricity producers, American Electric Power, together with one of the largest labor unions, The International Brotherhood of Electrical Workers. It has subsequently gained the support of major business and labor organizations. However, its opposition by the National Foreign Trade Council (NFTC), whose membership includes many large and politically active U.S.-based multinational corporations, indicates that the fate of offsetting border measure provisions in any climate change legislation during the next couple of years is uncertain.

Whatever the domestic situation in the U.S., there are of course international repercussions, including in particular hostility to the proposal in major developing country exporters to the U.S. in energy intensive goods (e.g. steel from China and India). There are two ways to address this problem - one focused on domestic measures and the other focused on international measures. The domestic measures alleviate the concerns of vulnerable domestic firms by excluding vulnerable industries from coverage by the cap-and-trade system and/or by distributing allowances free to those industries instead of auctioning them. Although these domestic measures might reduce the international competitiveness issues enough to avoid the domestic industry pressures against offsetting border measures, they also directly undercut the effectiveness of the cap-and-trade system because they exclude the most greenhouse gas intensive industries from coverage.

Thus, other more internationally-oriented approaches should be considered. There are at least four specific ways to reduce - though not necessarily eliminate - the international tensions between the U.S. and some of its major trading partners and to reduce the deleterious effects on the multilateral trading system, if offsetting border measures are included in legislation that is ultimately passed:

- In any legislation establishing a national cap-and-trade system, include language that explicitly supports the *multilateral* climate and trade regimes and pledges positive and constructive U.S. engagement in efforts to strengthen those regimes. Although such a legislative provision would be only an expression of generalized support, it would be welcomed by an international community that has grown skeptical about U.S. congressional and presidential commitments to multilateralism for the past many years.
- Pledge to work with other countries - the E.U. in particular - to include specific measures to address the "free rider" problem in the post-2012 multilateral climate regime. Any such effort will of course depend on U.S. participation in an multilateral post-2012 climate regime.
- Include offsetting border measures that address international competitiveness concerns in "sectoral" agreements that could be part of the post-2012 climate regime. Such sector-

specific measures to address international competitiveness issues could be in addition to the more generalized “umbrella” provisions noted above.

- Allow U.S. importers to purchase international offset credits based on projects in other countries instead of requiring them to purchase credits from the specially-created international allowance fund managed by the U.S. government, as currently provided in S. 2191.

### **3. Tariffs and Non-tariff Barriers to Trade, Investment and Technology Transfer**

Tariff and non-tariff barriers that restrict international trade, investment and technology transfer in industries that are directly relevant to climate change mitigation or adaptation have long been on the negotiating agendas of multilateral, regional and bilateral trade agreements. However, until quite recently they were not *explicitly* identified as climate change relevant issues. Now, as a result of developments in the U.S. and WTO and in other arenas, there is widespread active interest in explicitly identifying such goods and services, and including them as climate change issues on trade negotiating agendas.<sup>9</sup>

#### **Manufactured Goods**

European Trade Commissioner Mandelson made a proposal along these lines in December 2006 (European Commission, 2006), though without specifying the products to be included.<sup>10</sup> In November 2007, the U.S. government joined with the E.U. to make essentially the same proposal (EurActiv, 2007c), but with reference to a list of 43 manufactured goods.<sup>11</sup> A previous list developed by the Office of the U.S. Trade Representative (USTR, 2006) in response to a provision in the U.S. Energy Policy Act of 2005, identified 51 greenhouse gas (intensity) reducing products exported by the U.S. In sum, 27 products appeared in both lists, 16 in only the E.U.-U.S. list, and 18 in only the USTR list, for a total of 61. (See Annex II for a detailed comparison of the lists.)<sup>12</sup>

The World Bank study reports average bound and applied tariff level data for country groups. In Table 2 below, I have added applied tariff level data for the U.S. so that its tariff levels can be compared with the average applied levels of other countries. In sum, U.S. applied tariffs are

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<sup>9</sup> Concerns that national and international efforts to address climate change might infringe on an open international trade system are evident in several provisions of the FCCC and Kyoto Protocol: Article 2:3 of the Kyoto Protocol notes that parties should “strive to implement policies and measures...in such a way as to minimize adverse effects, including the adverse effects...on international trade....” Article 3.5 of the FCCC notes that “The parties should cooperate to promote [an]...open international economic system’ and that ‘measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.” Article 4.2 of the FCCC notes that “measures taken to combat climate change, including international ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.”

<sup>10</sup> The United States has imposed de facto, firm-specific quotas on the number of hybrid fuel automobiles produced by any one manufacturer that can receive a tax credit – quotas that happen to affect only Japanese-based manufacturers, since their hybrids are the best-selling models in the U.S.

<sup>11</sup> The list of manufactured goods had been developed as part of a World Bank (2008) empirical study of trade and climate change issues.

<sup>12</sup> There are “dual use” issues with some of these products, a technical-and-political problem that has plagued environmental goods and services discussions at the WTO for many years in the Doha round of negotiations.

generally relatively low. They are zero in 13 of the 43 product codes listed in Table 2. They are more than 1.0 percent *lower* than the average of the high income countries in 21 categories, and within +/- 1.0 percent for 16 categories. On the other hand, there are some categories of boilers and turbines in which the U.S. tariffs of 5.2 percent and 6.7 percent, respectively, are more than the averages of low-middle income countries as well as high income countries. The U.S., it should be noted, is a significant importer as well as exporter of the products in the list of 43 HS code categories; in 2006, U.S. imports of those products amounted to \$18 billion, while exports were \$15 billion (Schwab, 2007).

**Table 2. Applied Tariff Rates on Select Climate-Friendly Technologies: Comparisons of U.S. Rates and Other Countries' Rates (percentages)**

HS Code	Product Description	Average Low-Middle Income WTO Members	Average High Income WTO Members	U.S.
392010	PVC or polyethylene plastic membrane systems to provide an impermeable base for landfill sites and protect soil under gas stations, oil refineries, etc. from infiltration by pollutants and for reinforcement of soil.	13	5	4.2
560314	Non-wovens, whether or not impregnated, coated, covered or laminated: of manmade filaments; weighing more than 150 g/m <sup>2</sup> for filtering wastewater.)	14	4	-0-
701931	Thin sheets (voiles), webs, mats, mattresses, boards and similar nonwoven products	13	4	4.3
730820	Towers and lattice masts for wind turbine	10	3	-0-
730900	Containers of any material, of any form, for liquid or solid waste, including for municipal or dangerous waste.	12	4	-0-
732111	Solar driven stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel.	18	5	0/5.7*
732190	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel. - Parts.	14	4	-0-
732490	Water saving shower.	19	4	-0-
761100	Aluminium reservoirs, tanks, vats and similar containers for any material (specifically tanks or vats for anaerobic digesters for biomass gasification)	11	4	2.6
761290	Containers of any material, of any form, for liquid or solid waste, including for municipal or dangerous waste.	13	4	5.7
840219	Vapor generating boilers, not elsewhere specified or included hybrid	5	4	5.2
840290	Super-heated water boilers and parts of steam generating boilers	5	4	4.3
840410	Auxiliary plant for steam, water and central boiler	5	3	3.5
840490	Parts for auxiliary plant for boilers, condensers for steam, vapour power unit	4	3	3.5
840510	Producer gas or water gas generators, with or without purifiers	5	2	-0-
840681	Turbines, steam and other vapour, over 40 MW, not elsewhere specified or included	5	3	6.7
841011	Hydraulic turbines and water wheels of a power not exceeding 1,000 kW	4	3	3.8
841090	Hydraulic turbines and water wheels; parts, including regulators	4	3	3.8
841181	Gas turbines of a power not exceeding 5,000 kW	5	2	2.5
841182	Gas turbines of a power exceeding 5,000 kW	5	2	2.5
841581	Compression type refrigerating, freezing equipment incorporating a valve for reversal of cooling/heating cycles (reverse heat pumps)	13	4	1.0

841861	Compression type refrigerating, freezing equipment incorporating a valve for reversal of cooling/heating cycles (reverse heat pumps)	7	4	-0-
841869	Compression type refrigerating, freezing equipment incorporating a valve for reversal of cooling/heating cycles (reverse heat pumps)	7	4	-0-
841919	Solar boiler (water heater).	10	4	-0-
841940	Distilling or rectifying plant	4	3	-0-
841950	Solar collector and solar system controller, heat exchanger	5	3	0/4.2*
841989	Machinery, plant or laboratory equipment whether or not electrically heated (excluding furnaces, ovens etc.) for treatment of materials by a process involving a change of temperature such as heating, cooking, roasting, distilling, rectifying, sterilizing, steaming, drying, evaporating, vaporizing, condensing or cooling.	6	3	0/4.2*
841990	Medical, surgical or laboratory stabilizers	6	2	-0-
848340	Gears and gearing and other speed changers (specifically for wind turbines)	8	3	-0-
848360	Clutches and universal joints (specifically For wind turbines)	9	3	2.8
850161	AC generators not exceeding 75 kVA (specifically for all electricity generating renewable energy plants)	7	3	2.5
850162	AC generators exceeding 75 kVA but not 375 kVA (specifically for all electricity generating renewable energy plants)	7	3	2.5
850163	AC generators not exceeding 375 kVA but not 750 kVA (specifically for all electricity generating renewable energy plants)	5	3	2.5
850164	AC generators exceeding 750 kVA (specifically for all electricity generating renewable energy plants)	5	3	2.4
850231	Electric generating sets and rotary converters; wind-powered	5	3	2.5
850680	Fuel cells use hydrogen or hydrogen-containing fuels such as methane to produce an electric current, through an electrochemical process rather than combustion.	18	3	2.7
850720	Other lead acid accumulators	16	5	3.5
853710	Photovoltaic system controller	10	3	2.7
854140	Photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes	4	1	-0-
900190	Mirrors of other than glass (specifically for solar concentrator systems)	7	3	2.0
900290	Mirrors of glass (specifically for solar concentrator systems)	12	3	2.8
903210	Thermostats	7	3	1.7
903220	Manostats	6	2	1.7

\* Some 6-digit product categories are subdivided into 8-digit categories with variable tariff rates. The entries reflect the lowest and highest rates for the 8-digit categories within the 6-digit category.

Sources: World Bank (2008: Appendix 6) for HS Codes, Product Descriptions and Average Tariff Rates; U.S. rates were added by the author from "Harmonized Tariff Schedule of the United States, 2007 (Rev. 2) accessed at [www.usitc.gov](http://www.usitc.gov) on October 23, 2007.

The E.U.-U.S. proposal for negotiating zero-level tariffs on climate friendly goods in the WTO was greeted with hostility - at least on the part of the Brazilian and Indian governments. Brazil is particularly concerned about the omission of biofuels from the E.U.-U.S. list, since Brazilian ethanol exports to the U.S. face highly restrictive tariffs (see, for instance, EurActive, 2007c).

## Biofuels<sup>13</sup>

Tariff rates in the biofuels industries had already been receiving some scrutiny in the context of U.S. renewable energy and agricultural legislation providing for increased subsidies for ethanol production, while extending a tariff on ethanol imports. In September 2007, Brazil added U.S. ethanol subsidies to a WTO dispute case (DS 365) against U.S. agricultural subsidies filed in July (FarmPolicy.com, 2007).

The current U.S. tariff rate for imported ethanol is 2.5 percent plus 14.27 cents per litre (54 cents per gallon).<sup>14</sup> Compared with production-plus-transportation costs for Brazilian ethanol exports to the U.S. of approximately 15 cents per litre (as of 2005), the effective U.S. tariff rate was equivalent to an *ad valorem* rate of approximately 100 percent. Data in Severinghaus (2005) indicated a \$1.01 cost-insurance-freight price of Brazilian ethanol in the U.S.; the *ad valorem* rate equivalent was thus 57 percent. See Figure 1.<sup>15</sup>

Of the many countries that have tariffs on imports of biofuel *feedstocks*, the U.S. has a relatively high rate of 19.1 percent on soybean oil, which is the principal feedstock used to make biodiesel fuel in the U.S. (Kerr and Loppacher, 2005: 57; UK, Department of Transportation, c.2003: 37).<sup>16</sup>

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<sup>13</sup> This section is based in part on Brewer (2007b). Many - *though not all* - ethanol and biodiesel fuels are cost-effective ways to reduce greenhouse gas emissions. There are important exceptions, depending for instance on the type of feedstock and land use changes involved in changing to biofuel feedstock production. Further, there are not only significant differences in the cost-effectiveness among the specific types of fuels depending on the feedstock used, there are also significant differences in countries' comparative cost advantages in producing them. As a result, how and where biofuels are produced are important determinants of the extent to which they can contribute to climate change mitigation, or in some instances even be counter-productive in that regard. In short, the production technologies and the country locations of production matter. Detailed life cycle analyses are thus needed for the specific types and production circumstances to determine GHG-mitigation potentials.

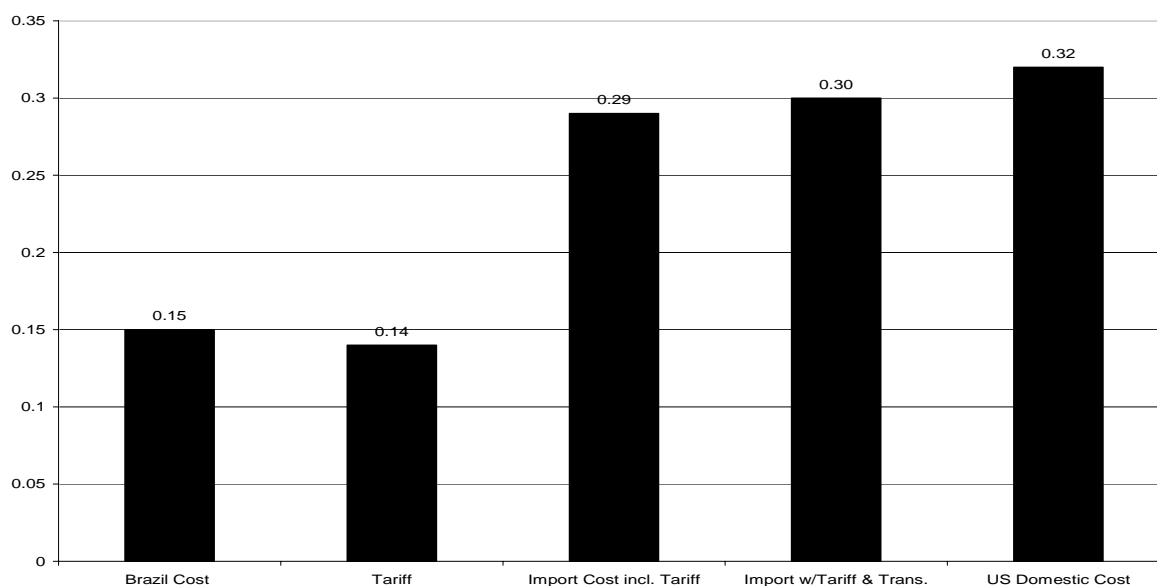
<sup>14</sup> In the HS Code, *biodiesel* is classified as an *industrial* product (while bioethanol is classified as an agricultural product.) Nearly 40 countries have bound rates on *biodiesel* greater than 20 percent. Among them, India is the highest at 30 percent (Steenblik (2006: 8, 26). The EU tariff is 5.1 percent and the U.S. 4.6 percent.

<sup>15</sup> Production costs of ethanol in the U.S. have subsequently increased substantially because of rapid increases in the price of corn, the principal feedstock for ethanol in the U.S. Sugar cane prices in Brazil have also risen, but not as much. Transportation costs are relatively low – less than 2 or 3 US cents per litre for ocean transport (IEA, 2005: 140).

<sup>16</sup> A U.S. government subsidy program that was intended to encourage domestic biodiesel production for domestic consumption turned out to have a loophole that was exploited by one or more biofuels firms as a way to collect subsidies based on a “splash and dash” scheme as it came to be called (Kram, 2007). The program provides for a 1 cent production subsidy per percentage point of biodiesel added to a blend with petro-diesel. One or more U.S.-based firms used the subsidy by importing biodiesel, blending it to create a 99.9 percent biodiesel blend, thereby collecting 99.9 cents on each gallon of blended fuel, and exporting the blend to Europe, where it also received a subsidy. The practice became a source of trans-Atlantic trade friction, when the European biodiesel industry and the Commission objected. By the end of 2007, there were efforts under way in the Congress to end the practice, with a provision in an energy bill proposing to make the rescission retroactive so that firms would have to pay back the subsidies they had collected, while the other simply ended the practice. Those provisions were dropped from the bill before it was passed, however The issue was therefore still unresolved in mid-January 2008, when the EU Ambassador to the U.S. expressed displeasure with the continuation of the practice and noted that U.S. biodiesel exports to the EU constituted about 15-20 percent of the EU market in 2007 and that the U.S. program thus represented a U.S. subsidy of European drivers of approximately \$300 million during the year (European Commission, Delegation to the U.S., 2008).

There are of course many industrial goods that are involved in the production of biofuels. For instance, there are small, complete refineries, which are classified as HS 8479.20 (“oil extraction machinery”). Oilseed crushing machines are classified as HS 8479.82. As Table 3 indicates, the U.S. is one of the countries in the world with the highest tariffs on these two types of machines.

**Figure 1. Effects of U.S. Tariff on Brazilian Imports of Ethanol (cents/litre)**



*N.B. These data were compiled before the price increases during 2006-2007 in the corn-based feedstock in the U.S. and sugar case-based feedstock in Brazil.*

Source: Compiled by the author from data in Paustian (2006) for Brazil, Fulton et al. (2004), and US ITC (2004 and 2006). For comparison, also see Severinghaus (2005).

**Table 3. Countries with High Applied Tariff Rates on Oil Extraction Machines and Oilseed Crushing Machines**

	Oil Extraction Machines (HS 8479.20)	Oilseed Crushing Machines (HS 8479.82)
China	30%	30%
India	25%	25%
United States	35%	35%

Source: Steenblik (2006: Annex Table 2, p. 25)

These data on tariffs on climate friendly goods, including ethanol and biodiesel and the manufactured equipment used in processing the feedstocks in the biofuel industry suggest that the E.U.-U.S. list of manufactured goods that they proposed for zero-level tariffs could be augmented in several ways:

- *Tariffs on biofuels could be added to the list.*<sup>17</sup> This possibility, however, immediately raises issues about standards and labeling because of the enormous variations in the net greenhouse gas emission effects, depending especially on the kinds of feedstock used and the types of changes in land use involved in expanding feedstock production. In some instances, biofuels result in a net *increase* in greenhouse gas emissions compared with their petroleum-based counterparts, while in others there are of course significant decreases. Brazilian ethanol based on sugar cane is approximately four times as cost-effective as U.S. corn-based ethanol in their reductions of greenhouse gas emissions. Among biodiesel feedstocks, palm oil can yield a significant net decreased or increase in greenhouse gas emissions compared with petro-diesel, depending primarily on land-use issues. (These and other issues are addressed further below in the section concerning standards and labeling.)
- *Tariffs on manufactured goods related to biofuels and other types of manufactured goods could also be added to the list.* As Table 3 reveals, at least some of those tariffs are quite high in all three of the countries in the table - i.e. the U.S. as well as China and India. Further research might reveal additional kinds of climate friendly goods beyond the 43 in the E.U.-U.S. list. For instance, there are 18 manufactured goods on the list noted above that was prepared by the USTR for a different purpose that are not on the E.U.-U.S. joint list.
- *The negotiating agenda should be expanded beyond tariffs to include non-tariff barriers, trade in services and foreign direct investment barriers.* The wide array of obstacles to international investment and technology transfer, as well as trade, in the wind energy industry are evident in Figure 2 below. They include such non-tariff barriers as joint-venture ownership requirements in foreign direct investments in manufacturing projects, restrictions on the international movement of engineers and others in services industries, and equipment safety inspection processes.

**Figure 2. Interactions of Types of Wind Energy Products and Types of Barriers to International Trade, Investment and Technology Transfer**

Types of Products: Goods & Services	Types of Barriers to International Trade, Investment and Technology Transfer		
	Specifically Targeted	Defined Categories for Product Groups	Generic Across Product Groups
Climate Change-Specific Good/Service: Wind mill generators	Tariffs on imported wind mill generators	Tariffs on blades of various types	FDI local joint venture requirements for manufacturing facilities
Dual Use: Electrical wires	Tariffs on electrical wires	Safety certification requirements for electrical goods	Import inspection policies

<sup>17</sup> The U.S. and the EU have reportedly blocked the inclusion of biofuels in the WTO negotiations. The U.S. has made contradictory classification arguments. It has argued that because biofuels are *agricultural* products, they cannot be included in the EU-U.S. proposal, which is limited to industrial goods. It has also argued in a WTO dispute with Brazil on agricultural goods that biofuels are *industrial* goods (International Herald Tribune, 2007b). In fact, *ethanol* is an *agricultural* good in the HS code, while *biodiesel* is an *industrial* good (see footnote 14).

General: Construction engineering services	Restrictions on cross border trade in construction engineering services	Licensing of engineering services firms	Restrictions on movement of natural persons
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Source: Developed by the author from information in Barton (2007: 20-30); also see Lewis (2007).

#### 4. International Aviation and Maritime Shipping

The international aviation and maritime shipping industries present quite different kinds of issues for the joint climate-trade agenda - for two reasons. First, there are already disputes involving both industries because of their greenhouse gas emissions - an international aviation dispute that has entered onto the agenda of U.S.-E.U. relations and the International Civil Aviation Organization (ICAO), and domestic legal actions within the U.S. that target both the international aviation and maritime shipping industries. Second, the two industries have always been outside the multilateral climate regime and the multilateral trade regime. Among the key issues, therefore, are whether, when, and how they can be or should be brought into either or both of the two multilateral regimes. These two sets of issues - concerning disputes and concerning their positions outside the multilateral regimes - are considered in turn.

##### International and Domestic Disputes

The first international trade-climate dispute has already begun, at least informally - namely the U.S. government's objections to the E.U. plan to cover aviation in its Emissions Trading Scheme (ETS). It is important to note that this is *not* a formal dispute brought within the context of the WTO dispute settlement process. Rather, the basis of the U.S. objection is the Chicago Convention on Civil Aviation of 1944, which established the system of bi-lateral agreements that regulate airline services and which is administered by the International Civil Aviation Organization (ICAO). At issue, in part, is Article 15 which includes the following provision: "No fees, dues or other charges shall be imposed by any contracting State in respect solely of the right of transit over or entry into or exit from its territory of any aircraft of a contracting State or persons or property thereon" (Chicago Convention, 1944).

While the Office of the U.S. Trade Representative has not made a formal public statement on the issue, the U.S. Federal Aviation Administration, the U.S. Ambassador to the E.U., and a representative of the U.S. airline industry association have been vocal about the issue. An unnamed U.S. government representative said the E.U. had decided to go ahead with the plan "despite strong objections raised by the US" (Financial Times, 2006d; also see ICTSD Bridges, 2007). A statement by the U.S. Ambassador to the E.U., Boyden Gray, in September 2007, was particularly direct: "We don't think Europe has the authority to do it....The Europeans are confident of their legal authority and people on the other side are equally confident of their position. It sounds like a lawsuit to me. I don't see how it's going to get resolved politically" (International Herald Tribune, 2007). A representative of the Air Transport Association of America similarly observed "If [the Europeans] persist, there will no doubt be a legal battle" (ICTSD Bridges, 2007); this comment following a meeting of the ICAO in October 2007. The meeting reversed a 2004 resolution that had supported regional emissions trading schemes. As a result, at the 2007 meeting 42 countries represented by the E.U. and the European Civil Aviation Conference formally stated a "reservation" to indicate that they would go ahead with the plan to include aviation in the E.U. Emissions Trading Scheme.

Whether it can be resolved politically remains to be seen. Importantly, the application of the E.U.'s Emission Trading Scheme to the aviation industry would not come into force until 2010 or 2011, with international flights into and out of the E.U. possibly not included until a year after the initiation of the system for flights within the E.U. This would mean transatlantic flights involving the U.S. would not be included until 2011 or 2012, long after a new U.S. administration will be in office. (For more on the case, see Council on Foreign Relations, 2007; Eurarchiv, 2007; Financial Times, 2006a, 2006b, 2006, 2006d, 2007a, 2007b; U.S. Mission to the E.U., 2007).

There have also been legal cases *within* the U.S. concerning the greenhouse gas emissions of both the international aviation industry and maritime shipping industry. Two separate but closely-related petitions were filed with the U.S. national government's EPA in October 2007. One concerning aviation was filed by the states of California, Connecticut, New Mexico, and Pennsylvania, the cities of New York and Washington, DC, a regional air quality district in California, and several environmental organizations. On the basis of a Supreme Court decision that requires the EPA to consider carbon dioxide and other greenhouse gases as air pollutants, the petition asks the EPA to apply regulations to all planes, including those of foreign airlines, that land or take off from airports in the U.S. - regulations that would reduce emissions through greater fuel efficiency, improved aircraft designs, and cleaner fuels. A similar petition concerning international maritime shipping was filed at the same time (ICTSD, Bridges BioRes, 2007c, 2007d).

### **Coverage of the Multilateral Climate and Trade Regimes**

Perhaps most importantly for the place of the international aviation and maritime shipping industries in the future climate change regime is the decision by the government of Norway to take a leadership role in an effort to include both industries in a the post-2012 climate regime. That effort has included an international workshop on the issue just prior to the Bali conference (IISD, 2007; Norway, 2007).

Since before the UNFCCC entered into force, there has been concern about the increasing contributions of GHGs of the two industries, and in fact in recent years the emissions of the two industries have been increasing as fast or faster than any other sectors. From 1990 to 2004, international aviation emissions increased by 34 percent and international maritime emissions increased by 43 percent. In recent years, aviation emissions have accounted for about 2 percent of total world GHG emissions and international maritime shipping has accounted for about 3 percent. The 5 percent of the world total for the combination of the two industries places them ahead of all but 5 national economies.<sup>18</sup>

However, technical problems with measuring their emissions and allocating them between domestic and international trips, together with political obstacles, prevented the industries' emissions from being included in Kyoto Protocol targets. Further, in the national government

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<sup>18</sup> In the case of aviation, there are also condensation trails, commonly called "contrails," which also have global warming effects. With contrails included, aviation's share of total global warming has been estimated to be as high as 9 percent (International Centre for Trade and Sustainable Development, 2007d: 7). Additional data on the emissions of the two sectors are available in Anderson, Bows, and Upham (2006), International Council on Clean Transport (2007), Lehman Brothers (2007), Norway (2007), and Sebastian and Piltz (2007).

and thus FCCC greenhouse gas reporting systems, the bunker fuels used for aviation and shipping are *not* included as national emissions, but rather are reported separately as international emissions that are not associated with any particular country.

Efforts to address the technical problems and formulate industry emission targets were referred to the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO). Many of the technical problems have since been solved. For instance, the government of Switzerland has reported that it has a “database with information on 16,000 individual aircraft and 400 different types of engines” and “knows the exact split between domestic and international aviation emissions” (IISD, 2007: 4). As the perception has grown that efforts to establish industry emission targets and other tangible evidence of progress in the addressing the problem have not materialized, efforts outside the UNFCCC framework and outside the two industry-based international organizations have been gaining momentum (IISD, 2007; Norway, 2007). The increasing interest in global sector-specific agreements as part of the post-2012 multilateral climate regime could facilitate inclusion of both industries in the new climate regime.

The two industries have not only been outside the multilateral *climate* regime; they have also been outside the multilateral *trade* regime. Government trade policies and industry practices have been considered within the context of the ICAO and IMO. International trade in both of their services has been subject to a combination of national subsidies, national protectionist policies such as those that prevent “cabotage” within countries by foreign firms, and international agreements that have limited competition among carriers.<sup>19</sup> Although the privatization and deregulation policies of many governments and the renegotiation of international agreements, especially in the airline industry, have reduced the subsidy and protection programs, international competition in both industries is still relatively constrained by national and international trade policies (again outside the WTO in both industries).

- Bringing both industries into the multilateral climate regime through a sectoral agreement and into the multilateral trade regime through the General Agreement on Trade in Services (GATS) could provide tangible benefits for both climate mitigation and trade.<sup>20</sup>

## **5. Programs that Promote Exports, Foreign Direct Investments and Technology Transfers**

The U.S. government, of course, has many programs that promote exports - not only in the agricultural sector but also in manufacturing. Programs that facilitate renewable energy and energy efficiency product exports were expanded in two recent major energy bills - the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007.

### **Energy Policy Act of 2005**

The interest in promoting exports is apparent in the “Climate Change” title of the Energy Policy Act of 2005, where the emphasis is on market access for U.S. exports and intellectual property

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<sup>19</sup> Shipping industry price-fixing and capacity-regulating practices are coming under greater scrutiny of EU competition policy authorities (see Goliath, 2007).

<sup>20</sup> Some industry spokespersons have indicated their preference for a global industry-wide approach (ICTSD, 2007c: 6).

rights protection for U.S. firms.<sup>21</sup> That title of the act specifically requires the Office of the U.S. Trade Representative (USTR) to: (1) identify developing countries' barriers to U.S. exports of greenhouse gas reducing technologies, (2) negotiate their removal, and (3) report to Congress annually on progress in achieving their removal. The negotiations could occur within the context of bilateral, regional and multilateral international trade agreements; they could involve investment and intellectual property issues, as well as trade issues; and they could cover international business transactions in the services, manufacturing and agricultural sectors. This mandate for the USTR and other executive agencies therefore expands the international climate change agenda for both business and government along numerous dimensions.

As for export promotion, the title requires an inter-agency working group to implement a Greenhouse Gas Intensity Reducing Technology Export Initiative to review the performance of U.S. government agencies in promoting such technologies. It also provides for the development of demonstration projects in developing countries and other forms of assistance (though without any funding levels specified). These export promotion activities also expand the climate change agenda for U.S. business as well as government agencies.

These expansions of the climate change agenda extend to Congress because additional committees in both the House of Representatives and the Senate will become more involved in key aspects of climate change issues. Subtitle A, which revises the Energy Policy Act of 1992, is focused on "greenhouse gas intensity reducing strategies," as are all the other sections of the title. It establishes organizational arrangements in the executive branch.<sup>22</sup>

Subtitle B revises the Global Environmental Protection Assistance Act of 1989 by adding two sections. There are two closely related, complementary emphases: the reduction of "trade-related

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<sup>21</sup> The U.S. Energy Policy Act of 2005 is also known as the Domenici-Barton Energy Policy Act, after the members who chaired the energy committees, respectively, of the Senate and House of Representatives and who were the leaders of the legislative processes in their chambers. The entire act is 550 pages long (in the printed version) and includes 18 titles; the "Climate Change" title is XVI. The other titles of the act with provisions concerning climate change cognate issues include: Energy Efficiency (I), Renewable Energy (II), Oil and Gas (III), Coal (IV), Vehicles and Fuels (VII), Hydrogen (VIII), and Energy Policy Tax Incentives (XIII). The text of the entire act is available at <http://frwebgate.access.gpo.gov> or <http://thomas.loc.gov/cgi-bin/query/D?c109:37:./temp/~c109X7YfVj>. Title XVI is commonly known as the Hagel-Pryor Amendment, after the senators who introduced it. The amendment was based on two bills (S. 883 and S. 887) that had previously been submitted by Senator Hagel but not passed. The Hagel-Pryor amendment passed the Senate by a vote of 66-29 and thus received the most support of any of the climate change amendments offered in the Senate during the deliberations on the Energy Policy Act during the summer of 2005 (see U.S. Congressional Research Service, 2005).

<sup>22</sup> The organizational arrangements include a Committee on Climate Change Technology, chaired by the Department of Energy, with representatives from the Council on Environmental Quality and Office of Science and Technology Policy in the Executive Office of the President, the Environmental Protection Agency, and the departments of Agriculture, Commerce, and Transportation (and a provision for the possibility of adding others in the future). Key industries are given direct access to the advisory process through the creation of the Climate Change Technology Advisory Committee consisting of the following: energy producing trade organizations – 3 members; energy-intensive trade organizations – 3 members; energy end-use and other consumer organizations – 3 members; federal government experts in energy technology, intellectual property and tax – 3 members; higher education experts in energy technology, recommended by National Academy of Engineering – 3 members; federal government national laboratories – 1 each from Department of Energy National Laboratories. Subtitle A also provides for the development of a domestic inventory of technologies and the creation of demonstration projects. Although it "authorizes" future expenditures, it does not indicate any dollar amounts; in any case, specific future actions by the Congress and the executive branch in subsequent budget cycle appropriations processes are required in order for the various provisions to be funded – as is normal practice.

barriers to export of greenhouse gas intensity-reducing technologies” in developing countries (section 734) and the promotion of U.S. exports through a “greenhouse gas intensity reducing technology export initiative” (section 735).

The key language of Section 734 follows: “Not later than 1 year after the date of enactment of this part [in July 2005], the United States Trade Representative shall (as appropriate and consistent with applicable bilateral, regional and mutual [*sic*] trade agreements) ...identify trade-relations barriers maintained by foreign countries to the export of greenhouse gas intensity reducing technologies and practices from the United States to the developing countries identified [as the 25 that are the largest greenhouse gases emitters]; and ... negotiate with foreign countries for the removal of these barriers”. Further, the United States Trade Representative must annually submit to Congress “a report that describes any progress made with respect to removing the barriers....”

Title XVI has extensive reporting requirements, including in particular reports to Congress. There are two required reports of inventories – one of technologies developed in the United States and the other of technologies that are “suitable” for transfer to developing countries (the latter presumably being a subset of the former). There are also reports of barriers – one of barriers in the United States to the commercialization and deployment of technologies, another of foreign countries’ barriers to the export of technologies from the United States. These and other reports are, for the most part, required to be submitted to the Congress generally, or specific committees of the Congress, as well as the public. Most must be submitted annually after the initial report. (See Annex III for additional details of the reporting requirements.)

The trade negotiations mandated by Title XVI were already within the purview of the USTR. Further, some of the issues concerning the interactions of the international climate change regime embedded in the Kyoto Protocol and the international trade regime embedded in the WTO have already received some attention within the context of the work program of the WTO Committee on Trade and Environment (WTO, 1998, 2001). In addition to the WTO, the negotiations mandated by Title XVI could occur in the context of a broad array of international trade agreements to which the U.S. is already a party (see Brewer, 1999, and Brewer and Young, 2000). These trade agreements are of course the result of decades of negotiations with virtually all countries in the world, and they have been conducted independently of the separate negotiations on multilateral, regional and bi-lateral climate change agreements.

The significance of Title XVI, therefore, does *not* concern the trade negotiating authority of the U.S. government. Rather, the significance of Title XVI is that it expands the climate change agenda in the U.S. by linking it explicitly to trade issues and by requiring that issues concerning technology transfers to developing countries be framed at least in part as trade issues.<sup>23</sup>

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<sup>23</sup> FDI policies are also relevant. For instance, the U.S.-based firm, Cargill, is investing in an ethanol production plant in Jamaica to use imported Brazilian sugar cane feedstock and then export the ethanol to the U.S. free of the U.S. tariff because Jamaica is a Caribbean Basin Initiative country (according to U.S. law). Although the use of FDI by multinational firms as a strategic alternative to circumvent trade barriers is, of course, a common phenomenon, it has attracted the interest of members of the U.S. Congress because the project was undertaken with the support of U.S. government subsidies for outward FDI under the auspices of the U.S. Overseas Private Investment Corporation (OPIC) – a government entity that provides loan guarantees and political risk insurance for outward FDI by U.S.-based corporations in developing countries.

## **Energy Independence and Security Act of 2007**

Title IX of the Energy Independence and Security Act of 2007 is specifically devoted to “International Energy Programs.” Numerous sections concern climate change: assistance for developing countries (sec. 911), exports and outreach programs for India, China and other countries (sec. 912), the Overseas Private Investment Corporation (sec. 914), U.S. Trade and Development Agency (sec. 915) and the establishment of an International Clean Energy Foundation (secs. 921-927).

Among the relevant provisions are the following export promotion mandates: the Agency for International Development (AID) “shall support policies and programs in developing countries that promote clean and energy efficient technologies... to promote the use of American-made ... technologies, products and energy and environmental management services” with authorized expenditures of \$200 million per year during 2008-2012 (sec. 911); the Commerce Department “shall expand or create a corps of the Foreign Commercial Service officers to promote United States exports in clean and efficient energy technologies and build the capacity of government officials in India, China, and [other countries]... (sec. 912); the Commerce Department shall create “reverse trade missions in which the Department... facilitates the meeting of foreign private and public sector organizations with private sector companies in the United States for the purpose of showcasing clean and efficient energy technologies” (sec. 913); the Overseas Private Investment Corporation (OPIC) “should promote greater investment in clean and efficient energy technologies by ... giving preferential treatment to the evaluation and awarding of projects that involve the investment or utilization of clean and efficient energy technologies (sec. 914); the Trade and Development Agency shall “where appropriate, advance the utilization of clean and efficient energy technologies, particularly to countries that have the potential for significant reduction in greenhouse gas emissions (sec. 915); and “integrate into the foreign policy objectives of the United States the promotion of ... the development of clean and efficient energy technologies and the reduction of greenhouse gas emissions in developing countries; and ... the export of clean and efficient energy technologies...” (sec. 916).

The net result of these numerous, diverse and detailed provisions of recent U.S. energy legislation is that climate-trade programs are likely to become more deeply embedded in a variety of U.S. export promotion and international economic development programs.

- The actual impact of these programs will depend on the levels of financial support given them in annual executive and congressional budgeting processes.
- Their fate may also depend in some instances on WTO disputes that may be filed against the U.S. (see section 8 below).

## **6. International Technology Cooperation Agreements**

Beginning in the early 1980s, there was a significant shift in U.S. trade policy towards more emphasis on the negotiation of bilateral and regional agreements - and less commitment to the multilateralism in trade policy that had been a hallmark of U.S. trade policy since the creation the General Agreement on Tariffs in Trade (GATT) in the 1940s. This shift in emphasis was first apparent in the Reagan administration, but it has continued in varying degrees in both Democratic and Republican administrations since the early 1980s. The tendency became

especially pronounced in the Bush II administration, beginning in 2001, as part of a broader retreat from multilateralism in U.S. diplomacy.<sup>24</sup>

As a result of this tendency toward increased bilateralism and regionalism in its trade policy, by 2007 the U.S. was involved in 14 Bilateral Free Trade Agreements, 39 Bilateral Investment Treaties, 27 Bilateral Trade and Investment Framework Agreements, and 5 Regional Agreements that were either in effect or under negotiation (USTR, 2007a). Altogether, there were 85 such agreements.<sup>25</sup>

The bilateralism was manifest, for instance, in the U.S.-Brazil bilateral biofuels agreement announced in March 2007 (U.S., White House, 2007). More generally, international climate change technology cooperation agreements have nearly all been only bi-lateral or regional in scope (see Table 4).

The proliferation of bilateral and regional agreements can be attributed in substantial part to two factors - one concerning international negotiations and the other domestic politics. First, such agreements enable the U.S. to be in a stronger negotiating position, as compared with multilateral forums. Second, because they can be counted and can be accumulated over time to produce more and more, they create a tangible record of activity, which can in turn be used to indicate commitment and progress in addressing an issue.<sup>26</sup>

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**Table 4. Partial List of U.S. Government Climate Change Programs with International Technology Transfer Elements**

Agreement (date)/ web site	Number of Countries	Mission/activities
Carbon Sequestration Leadership Forum (2003) <a href="http://www.fe.doe.gov/programs/sequestration/csLf">www.fe.doe.gov/programs/sequestration/csLf</a>	21	Members are dedicated to collaboration and information sharing in developing, proving safe, demonstrating and fostering the worldwide deployment of multiple technologies for the capture and long-term geologic storage of carbon dioxide at low costs; and to establishing a companion foundation of legislative, regulatory, administrative, and institutional practices that will ensure safe, verifiable storage for as long as millennia.
International Partnership for the Hydrogen Economy (2003) <a href="http://www.iphe.net">www.iphe.net</a>	17	The IPHE provides a mechanism for partners to organize, coordinate and implement effective, efficient, and focused international research,

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<sup>24</sup> The current U.S. (“Bush II”) administration has sometimes obscured the traditional distinctions by using the term “multilateral” to refer to what have traditionally been considered regional agreements. For instance, the Asia Pacific Partnership (APP) is sometimes referred to as a “multilateral” agreement, even though it includes only a small number of participants from one region. Within the multilateral WTO, there are “plurilateral” agreements that include only subsets of WTO members. One such agreement is the Agreement on Government Procurement, which directly affects trade in some goods related to climate change mitigation. See especially Van Asselt, van der Grijp and Oosterhuis (c. 2005).

<sup>25</sup> Although the U.S. has been particularly active in negotiating bilateral and regional agreements, it has not been the only country to do so. The number of such agreements “notified” to the WTO by its members totaled nearly 300 by early 2000 (WTO, 2007).

<sup>26</sup> The use of such quantitative indicators of accomplishment has been especially notable in recent years in reports on both international trade policymaking and international climate policymaking, including by the Office of the U.S. Trade Representative, Department of State and the White House.

		development, demonstration and commercial utilization activities related to hydrogen and fuel cell technologies.
Methane to Markets (2004) <a href="http://www.methanetomarkets.org">www.methanetomarkets.org</a>	22	Advances cost-effective, near-term methane recovery and use as a clean energy source
International Energy Agency (1974) <a href="http://www.iea.org">www.iea.org</a>	26	To encourage collaborative efforts to meet these energy challenges [including climate change], the IEA created a legal contract – Implementing Agreement – and a system of standard rules and regulations. This allows interested member and non-member governments or other organisations to pool resources and to foster the research, development and deployment of particular technologies.
Asia Pacific Partnership (2005) <a href="http://www.asiapacificpartnership.org">www.asiapacificpartnership.org</a>	7	...work together and with private sector partners to meet goals for energy security, national air pollution reduction, and climate change in ways that promote sustainable economic growth and poverty reduction. The Partnership will focus on expanding investment and trade in cleaner energy technologies, goods and services in key market sectors.
Energy Star agreements (various years) <a href="http://www.energystar.gov">www.energystar.gov</a>	7 bilaterals	Agreements to promote certain ENERGY STAR qualified products were established with government agencies in various countries. These partnerships are intended to unify voluntary energy-efficiency labeling programs in major global markets and make it easier for partners to participate by providing a single set of energy-efficiency qualifications, instead of a patchwork of varying country-specific requirements.
ITER (1985) <a href="http://www.iter.org">www.iter.org</a>  [Originally ITER was an acronym for International Thermonuclear Energy Reactor, but it is now interpreted as representing “The Way” as in Latin.]	7	The programmatic goal of ITER is "to demonstrate the scientific and technological feasibility of <i>fusion</i> power for peaceful purposes". Compared with current conceptual designs for future fusion power plants, ITER will include most of the necessary technology, but will be of slightly smaller dimensions and will operate at about one-sixth of the power output level.

N.B. This is a partial list. For a more nearly complete list, see [www.usctcgateway.gov/usctc/programs/](http://www.usctcgateway.gov/usctc/programs/)  
Source: Compiled by the author from the web sites identified in the first column, accessed on 27 November 2007, and from Karsner (2007: 29-30) and Connaughton (2007: 5)

Programs listed in Table 4 offer much variety not only in their memberships and technologies, but also in the extent and significance of their activities. Some such as the ITER have been in existence for many years and involve large, long-term tangible projects - now fusion research in that particular case. Others such as APP are relatively new and thus far have been mostly devoted to forming committees and other working groups. The levels of funding have also not necessarily reflected the scope of the objectives in all instances. The Congress has balked, for instance, in funding the APP at levels requested by the administration because of concerns about the seriousness of the intentions that led to its creation. Nevertheless, collectively, these arrangements could lead to significant international trade in technology, especially in some key technologies such as carbon sequestration and energy efficiency. Despite whatever variations and uncertainties there may be in their particular activities, these programs can provide a kind of institutional infrastructure that could be used to develop and fund a wide variety of international technology transfer activities in the future.

- A key challenge will be to coordinate the programs with the post-2012 multilateral climate regime and perhaps integrate them into it, since the regime is likely to include a much-augmented technology component.

## 7. Program Budgets

Some U.S. government programs on the joint climate-trade agenda are highly dependent on budget support, and thus also dependent on the support of key congressional committees. This is particularly true of energy efficiency and renewable energy programs, international technology cooperation projects and international development assistance programs.

The data in Table 5 reflect the administration’s proposals and Congressional actions on appropriations for the Office of Energy Efficiency and Renewable Energy in the Department of Energy for fiscal year 2008. Congressional action on this and other budget issues, as well as the President’s acceptance of the Congressional action, occurred at the same time as action on the Energy Independence and Security Act of 2007 in mid-December of that year. The data reveal that the President had proposed a 16.1% *reduction* for FY08 over FY07. The Congress, however, passed an 18.0% *increase* (which was the amount approved when the President ultimately signed the appropriation bill presented to him by Congress). The Congressionally-approved amount, therefore, represented a 40.7% increase over the amount initially proposed by the President.

**Table 5. Comparison of Presidential Proposals and Congressional Actions for Department of Energy Energy Efficiency and Renewable Energy Appropriations for FY 2008**

Fiscal Year	FY2007	FY2008 Proposed by President	FY2008 Enacted by Congress
Billions of dollars	1.474	1.236	1.739 <sup>a</sup>
Percent change: 2007 to 2008		16.1% decrease	18.0% increase
Congressional increase over Presidential proposal			40.7% increase

<sup>a</sup> There was an unusual immediate rescission of \$265 million (or 0.91%) so that the net appropriation was \$1.724 billion. The calculations of percentage changes in the table are based on the \$1.739 billion, and would be less than 1% different if calculated on the basis of the 1.724 billion amount.

Source: Computed by the author from US DOE (2008)

Within the total for energy efficiency and renewable energy programs, the President’s proposal had specifically focused on two “line items” concerning international programs. One was the “international renewable energy program,” which was targeted for a 100% reduction from \$9.473 million in FY07 to zero in FY08. At the same time the Administration proposed \$7.500 million in FY08, compared with the zero-level funding that Congress had put in the FY07 appropriation for an item labeled “Asia [P]acific.” Both of these proposed changes, however, were apparently jeopardized, if not rejected, since the language of Title III of the appropriation bill passed by Congress requires of the Department of Energy “[t]hat any change in program implementation should be proposed to Congress in the Department’s budget submission and not implemented before congressional approval is obtained.”

This is but one recent example of how the climate-trade joint agenda arises in the context of the annual budget process. For other examples and a more detailed analysis of budgeting for U.S. climate change and selected energy programs, see Brewer (2007c).

The budgets for climate change programs are now widely scattered among a dozen or more executive agencies and thus also included in several different authorization and appropriations bills that must pass through numerous committees and subcommittees in both houses of Congress. Given the diverse nature of the climate change issues, this is perhaps inevitable. There is, however, a problem of Congressional monitoring and control because the annual report prepared by the White House Office of Management and Budget that aggregates information on all the climate programs is not submitted to Congress until a few months after the budget message.

## **8. Subsidies for Renewable Energy and Energy Efficiency**

The National Foreign Trade Council's (NFTC, 2007: 11-14) detailed analysis of several climate and energy Congressional bills (pending or enacted)<sup>27</sup> in the 110<sup>th</sup> Congress finds several WTO-compatibility problems, especially in relation to the Agreement on Subsidies and Countervailing Measures (SCM). For example, there is a provision in H.R. 6 that the purpose of the legislation is "to accelerate the use of *domestic* renewable energy resources and alternative fuels" (italics added by the author; cited in NFTC, 2007: 13). Other problems in other bills are also cited.

Further, as noted above in the discussion of biofuels in section 3 of the paper, Brazil has included U.S. subsidies of biofuels in a dispute it filed with the WTO in 2007. The NFTC (2007: 14) notes that "Trade in biofuels is one example of how comprehensive energy and climate change legislation is posing fundamental institutional challenges to the multilateral trade system. The SCM Agreement may be one of the first WTO documents revised in overcoming this challenge."

Because of the widespread use of subsidies in energy and agricultural policies in many other countries in addition to the United States, it is likely that there will be more WTO disputes arising in the future. The disputes are not likely to be limited to biofuels. It has been suggested by Green (2006; cited in NFTC, 2007: 13n32) that the SCM should be revised in order to allow for "legitimate" subsidies that are undertaken for climate change mitigation.

- In the development of climate-relevant subsidies, the U.S. and other government policymaking processes should take into account more fully the need for the subsidies to be WTO-compatible.
- The possibility of revising the Agreement on Subsidies and Countervailing Duties to accommodate climate-relevant subsidies more explicitly should be on the WTO agenda.
- Negotiations of the post-2012 multilateral climate change regime should address issues about the cost-effectiveness of subsidies and their appropriateness as measures to address climate change mitigation.

## **9. Product Labeling and Standards Issues**

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<sup>27</sup> H.R. 6 (Senate and House versions), H.R. 1506, H.R. 2776, H.R. 3221, S. 280, and S. 2191.

Issues concerning product labeling and standards in international trade have been much less prominent in the United States than in Europe. Examples in Europe include the “food miles” debate, particularly in the UK, and proposals for the EU to require sustainable certification of imported palm oil.<sup>28</sup> The issues to date in the U.S. have been more narrowly focused, and again include WTO-compatibility concerns (NFTC, 2007), including both the Agreement on Subsidies and Countervailing Measures (SCM) and the Agreement on Technical Barriers to Trade (TBT). Of special concern are renewable fuel standards, corporate average fuel economy (CAFE) standards, and energy efficiency labeling standards on consumer products.

There have been previous WTO dispute cases against the U.S. for earlier related policies - a 1994 case on CAFE standards and a 1996 gasoline case. Whether related new policies would be sufficiently different to avoid WTO-compatibility problems remains to be seen.

- Any new legislative or administrative proposals on issues about which there have been previous WTO disputes must take into account the reasoning and outcomes of those cases.

## 10. Government Procurement

Issues have arisen about whether provisions in the Renewable Energy and Energy Conservation Act of 2007 are compatible with the WTO plurilateral Government Procurement Agreement (GPA), to which the U.S. is a signatory (NFTC, 2007: 14-17). A key issue is whether provisions such as those requiring U.S. government agencies to purchase “low greenhouse gas emitting” vehicles and to take into account energy efficiency standards in their purchasing decisions could violate WTO non-discrimination principles or constitute disguised protectionism. There are several reasons to believe there would not be such problems. In particular Article XXIII of the GPA, like Article XX of the GATT, allows exceptions to national treatment on the grounds of protection of “human, animal, or plant life....”

The conclusion of the NFTC was that the provisions of the Renewable Energy and Energy Conservation Act “do not appear to be in violation” of the GPA. However, it also noted that “government procurement program specifications are more likely to qualify for GPA exceptions if governments demonstrate their intent to engage multilaterally” (NFTC, 2007: 17).

As for other countries, since only twelve countries<sup>29</sup> plus the E.U. are signatories to the GPA, its provisions are irrelevant to most countries. Yet, since the signatories do include for instance major trading countries - China, the E.U. and Japan, in particular - there could be GPA-related issues arise. An extensive analysis by Van Asselt, van der Grijp and Oosterhuis (2006) examines a variety of issues about the intersection of climate-trade issues in relation to the GPA.

- Efforts should be made to include more countries in the WTO Agreement on Government Procurement, because of the significance of government agencies at all levels of government in electricity production and distribution projects and other climate-sensitive

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<sup>28</sup> The World Bank has launched a study of climate-related labeling and standards issues in international trade.

<sup>29</sup> U.S., Canada, China, Hong Kong, Iceland, Israel, Japan, Korea, Liechtenstein, Norway, Singapore, and Switzerland.

projects, and because international trade, investment and technology transfer can make important climate-friendly contributions to those projects.

## 11. Clean Development Mechanism (CDM) and Joint Implementation (JI) Projects

Wide-ranging as it is, the U.S. climate-trade agenda thus far does not include another set of issues that are on the agendas of other countries as well as the multilateral FCCC, namely the trade, investment and technology transfer issues associated with the Clean Development Mechanism (CDM) and Joint Implementation (JI) projects of the FCCC/Kyoto Protocol. These issues have not been on the U.S. government agenda because of its non-participation in the Kyoto Protocol.<sup>30</sup>

Nevertheless, it should be noted that a recent study conducted by the UNEP Risö Center in Denmark for the OECD (2007: 6; italic added) found that initiatives within the context of the CDM approval process could “help to reduce barriers [to CDM projects including those that reduce] participation/ownership restrictions on *foreign investment and ownership* in sectors liable to CDM investments.”

Further, CDM and JI projects reflect the strong *interdependencies* among international trade, direct investment and technology transfer that are often especially evident at the project level. Large multinational firms, in particular, often “bundle” complex packages of trade in goods and services, licensing, loans and other international transactions in conjunction with their foreign direct investment projects involving foreign wholly-owned subsidiaries and international joint ventures. Such bundling may therefore be important in some CDM and JI projects. As the analysis of climate-trade intersections moves forward, therefore, it will be important to conduct research and policy analysis at the project level of analysis.

- Efforts at all levels to enhance international technology transfers through CDM and JI projects should take into account *host* government international trade and investment policies and firms’ technology transfer practices, including trade and investment as modes of technology transfer.

## 12. Implications

There is much diversity in the types of climate-trade issues that are already evident. Some are essentially contemporary manifestations of familiar WTO issues about tariffs and non-tariff barriers to trade, including Doha Round issues concerning trade in environmental goods and services. The same may be said of issues about subsidies and government procurement. There is much previous conceptual and empirical analysis, as well as negotiating experience, dispute cases, and institutionalized memory, that can be drawn upon in addressing such issues.

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<sup>30</sup> CDM projects - as approved by the UNFCCC Executive Board on a case-by-case basis - are undertaken in developing countries by entities in developed countries. Specifically, Article 12 provides for Annex I Parties to implement project activities that reduce emissions in non-Annex I Parties, in return for certified emission reductions (CERs). Joint Implementation (JI) projects - also with UNFCCC Executive Board approval - are undertaken by Annex I countries in other Annex I countries, for which emission reduction units (ERUs) are granted (Article 6). Issues concerning technology transfer through Clean Development Mechanism (CDM) projects in developing countries have been addressed for instance in Haites, Duan and Sere (2006).

Other issues are relatively new issues about the use of trade to address free-rider problems in multilateral environmental agreements (though such issues have arisen in relation to other MEAs, including the Montreal Protocol on Ozone Depletion). The existing analytic work and negotiating experience for addressing these issues are therefore more limited.

### **Climate-Trade Policymaking in the U.S.**

Climate-trade policymaking is deeply embedded in institutional and attitudinal tendencies in the U.S. Congress and executive agencies, and those tendencies will directly affect U.S. government positions in negotiations about the post-2012 international climate regime. Though the particular manifestations of these tendencies will vary according to the composition of the Congress as well as the identity of the President, the basic tendencies are likely to be evident no matter what the outcomes of the next several Congressional and Presidential elections.

Realistic expectations about the roles and policy positions of the U.S. government in international climate regime negotiations will need to take these tendencies into account. For instance, climate-trade issues will continue to be substantially partisan issues in Congress, though with important splits within both parties along regional and industry lines.

Further, on some occasions at least, there may be a tendency in Congress to formulate policies unilaterally and on the basis of domestic political considerations, without much concern for WTO-compatibility or other international repercussions. This seems to have been the case with at least some of the energy efficiency and renewable energy subsidies and standards. The offsetting border measures provisions in the climate legislation, in contrast, have been explicitly tailored in detail in an effort to avoid WTO-compatibility problems.

### **Multiple Venues and Institutional Levels**

The implications of the paper extend far beyond U.S. national policymaking, for there are numerous international forums where climate-trade joint agenda issues will be considered in the future. In fact, they are already on the agendas of the multilateral climate, trade and development institutions - i.e. the FCCC, the WTO and the World Bank. Further, they will appear in the context of bilateral, regional and plurilateral climate and trade agreements, and they will also appear in the context of international interactions involving sub-national governmental units. The possibility of further proliferation of both climate and trade agreements at all levels offers the prospect of ever more complex multi-level arrangements and issues on the agenda. Such fragmentation will create complexities, conflicts and inefficiencies that will be detrimental to the efforts of government and international organization officials who implement international agreements and to the operations of business executives who conduct international transactions.

### **Trade and Investment**

In any case, the agenda of the WTO will surely be expanded in coming years, as a variety of international trade-investment-technology initiatives driven by climate change concerns are suggested. The several prefatory quotes at the beginning of the paper have already signaled a change in the WTO agenda - at least informally. Linkages between goods and services, and between industrial and agricultural issues will need to be addressed more explicitly and systematically. Further, because of the important role of foreign direct investment (FDI) and

multinational firms in international technology transfer, FDI issues are likely to intrude more frequently onto the WTO agenda - either in the form of pressures to expand the limited coverage of FDI based on existing agreements and/or to address FDI-related disputes.

In addition, the hundreds of existing bilateral and regional trade and investment agreements are likely to come under scrutiny for provisions concerning climate-friendly goods and services, with the objective of determining whether they are facilitating or inhibiting trade, investment and technology transfers that could mitigate greenhouse gas emissions.

### **Climate Change Negotiations**

The possibility of unilateral adoption of offsetting border measures by the U.S., E.U. and perhaps others poses a threat to the future multilateral climate regime as well as the multilateral trade regime. A possible approach to this problem would be the development of a multilateral free rider arrangement involving offsetting border measures that would be specifically crafted for the post-2012 climate regime, with active involvement of the WTO to insure its compatibility with WTO principles. Such provisions could be integrated into an umbrella multilateral climate agreement and also in any plurilateral sector-specific climate agreements that may emerge.

### **Coordinating/Integrating Climate and Trade Regimes**

Sectoral climate-trade agreements may offer opportunities to coordinate climate and trade policies, or perhaps even to integrate them institutionally. WTO negotiations and agreements are structured to a great extent in terms of industries or specific products and thus industry sector lines - for instance, in the Harmonized Tariff Codes in the GATT and in the lists of "specific commitments" in the GATS. Such product-based and industry-based structuring could bode well for attempts to develop sectoral climate agreements as part of the post-2012 multilateral climate regime. If interest in globally-applicable, industry-specific sectoral climate agreements continues to spread, it is inevitable that those discussions will involve international trade and investment issues; for international competitive concerns have become integral to the international dialogue about the future of the international climate regime. One hopes the dialogue will result in agreements that will be creative and constructive additions to the climate and trade regimes.

**Annex I Comparisons of International Trade, Investment and Technology Transfer Provisions in Climate Change Bills Pending in the U.S. Congress, January 2008**

<b>Bill Numbers, Sponsors, Names</b>	<b>Restrictions on Imports into U.S. from "Free Rider" Countries</b>	<b>U.S. Export Promotion and Business Opportunities</b>	<b>Financial Assistance for Developing Countries, including Credits for Offsets</b>	<b>Limits on Use of International Emissions Credits</b>	<b>Other</b>
<b>Senate</b>					
S.280, McCain-Lieberman, Climate Stewardship and Innovation Act		Sec. 311	Sec. 145		
S.309, Sanders-Boxer, Global Warming Pollution Reduction Act			Sec. 716		
S.317, Feinstein-Carper, Electric Utility Cap and Trade Act					Sec. 719
S.485, Kerry-Snowe, Global Warming Reduction Act				Sec. 301	
S.1168, Alexander-Lieberman Clean Air Climate Change Act					
S.1177, Carper, Clean Air Planning Act					
S.1201, Sanders, Clean Power Act					
S.1766, Bingaman-Specter, Low Carbon Economy Act	Secs. 501-502				
S. 2191, Lieberman-Warner, America's Climate Security Act	Secs. 6001-6007			Secs. 2501-2503	Secs. 3801-3806

House					
H.R.620, Olver-Gilcrest, Climate Stewardship Act [similar to S.280, not identical]			Sec. 145		
H.R.1590, Waxman, Safe Climate Act					

**Summaries of provisions:**

McCain-Lieberman, S.280

Sec. 145 establishes a program “to assist developing countries in achieving sustainable development and in contributing to the objective of reducing” GHG emissions, which program would include “tradeable allowances from project activities in developing countries resulting in certified emission reductions.” [same as H.R. 620]

Sec. 311 requires Secretary of Commerce to conduct an annual “analysis of business opportunities, both domestically and internationally, available for climate change technologies” and report the “findings and recommendations to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science.”

Sanders-Boxer, S.309

Sec. 716 requires the executive branch to: establish a “Task Force on International Clean, Low-Carbon Energy Cooperation,” develop a “strategy” to “promote the adoption of clean, low-carbon energy technologies and energy-efficiency technologies” in developing countries, “open and expand clean, low-carbon energy technology markets” and “facilitate the export of that technology” from the U.S. to developing countries.

Feinstein-Carper, S. 317

Sec. 719 limits use of international credits.

Kerry-Snowe, S.485

Sec. 301 on “International Negotiations and Trade Restrictions” is a “Sense of the Senate” resolution that the U.S. should “foster sustained economic growth through a new generation of technologies” by participating in the UNFCCC negotiations and by “leading efforts in other international forums, with the objective of securing participation of the United States in agreements that... advance and protect the economic ... interests of the United States...”

Bingaman-Specter, S.1766

Secs.501-502 require periodic reviews of “whether each of the 5 largest trading partners” of the U.S. has taken “comparable action” as the U.S. to limit GHG emissions, “taking into account the level of economic development of the foreign country.” U.S. importers of “covered” GHG-intensive goods from countries that have been found not to have taken comparable actions must purchase “international reserve allowances” issued by the U.S. government. *N.B.* There are numerous provisions concerning definitions, reporting requirements, negotiations, exceptions and other aspects of this proposal. These are analyzed in a separate side-by-side comparative chart in “Border Measures on Imports to Address International Competitiveness and Free Rider Issues, as Contained in Pending U.S. Senate Climate Bills.”

Lieberman-Warner, S. 2191

Title VI, “Global Effort to Reduce Greenhouse Gas Emissions,” (Sections 6001-6007) would establish a requirement that U.S. importers of covered goods from covered countries purchase “international reserve allowances.” In that core provision and in many of its details, it is quite similar to S. 1766 (see above). *N.B.* There are numerous provisions concerning definitions, reporting requirements, negotiations, exceptions and other aspects of this proposal. These are analyzed in a separate side-by-side comparative chart in “Border Measures on Imports to Address International Competitiveness and Free Rider Issues, as Contained in Pending U.S. Senate Climate Bills.”

In Title II, “Managing and Containing Costs Efficiently,” Secs. 2501-2503 limit the use, for any one covered facility in the U.S., of credits obtained from *foreign* GHG emissions trading markets to 15 percent of the total allowances required by the *domestic* allowance program. Note that this is *not* part of the “international reserve allowances” program noted in the paragraph above concerning Title VI.

In Title III, “Allocating and Distributing Allowances,” Subtitle H - International Forest Protection, Secs. 3801-3806, provides that 3 percent of the annual allocation from the Emission Allowance Account would be for “forest carbon activities” in *foreign* countries.

Olver-Gilcrest, H.R.620

Sec. 145 establishes a program “to assist developing countries in achieving sustainable development and in contributing to the objective of reducing” GHG emissions, which program would include “tradeable allowances from project activities in developing countries resulting in certified emission reductions.” [same as S.280]

Waxman, H.R. 1590

No international provisions.

Source: Compiled by the author from texts of the bills at the Library of Congress, [www.loc.thomas.gov](http://www.loc.thomas.gov), accessed on 20 October 2007.

**Annex II. Comparisons of E.U.-U.S. and USTR Lists of Climate Change Relevant Goods**

HS Code	Product Description	List(s) in which Product Appears		
		Both	E.U.-U.S. Only	USTR Only
<b>39</b>	<b>Plastics and articles thereof</b>	<b>1</b>	<b>0</b>	<b>3</b>
391721	Tubes, pipes & hoses, rigid of polymers of ethylene (specifically piping for methane gas removal/reuse, leachate collection, etc. from landfills)			x
391722	Tubes, pipes & hoses, rigid of polymers of polymers of propylene (specifically piping for methane gas removal/reuse, leachate collection, etc. from landfills)			x
301723	Tubes, pipes & hoses, rigid of polymers of vinyl chloride (specifically piping for methane gas removal/reuse, leachate collection, etc. from landfills)			x
392010	PVC or polyethylene plastic membrane systems to provide an impermeable base for landfill sites and protect soil under gas stations, oil refineries, etc. from infiltration by pollutants and for reinforcement of soil.	x		
<b>56</b>	<b>Wadding, felt and nonwovens; special yarns, twine, cordage, ropes and cables and articles thereof</b>	<b>0</b>	<b>1</b>	<b>0</b>
560314	Non-wovens, whether or not impregnated, coated, covered or laminated: of manmade filaments; weighing more than 150 g/m2 for filtering wastewater.)		x	
<b>70</b>	<b>Glass and glassware</b>	<b>0</b>	<b>1</b>	<b>0</b>
701931	Thin sheets (voiles), webs, mats, mattresses, boards and similar nonwoven products		x	
<b>73</b>	<b>Articles of iron or steel</b>	<b>2</b>	<b>3</b>	<b>0</b>
730820	Towers and lattice masts for wind turbine	x		
730900	Containers of any material, of any form, for liquid or solid waste, including for municipal or dangerous waste.	x		
732111	Solar driven stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel.		x	
732190	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel. - Parts.		x	
732490	Water saving shower.		x	
<b>76</b>	<b>Aluminum and articles thereof</b>	<b>1</b>	<b>1</b>	<b>0</b>
761100	Aluminium reservoirs, tanks, vats and similar containers for any material (specifically tanks or vats for anaerobic digesters for biomass gasification)	x		
761290	Containers of any material, of any form, for liquid or solid waste, including for municipal or dangerous waste.		x	
<b>84</b>	<b>Reactors [nuclear], boilers, machinery and mechanical appliances; parts thereof</b>	<b>15</b>	<b>5</b>	<b>15</b>
840211	Watertube boilers steam production exceeding 45 tons per hour			x
840212	Watertube boilers steam production not exceeding 45 tons per hour			x
840219	Vapor generating boilers, not elsewhere specified or included hybrid	x		

840220	Super-heated water boilers			x
840290	Super-heated water boilers and parts of steam generating boilers	x		
840410	Auxiliary plant for steam, water and central boiler	x		
840420	Condensers for steam or other vapor power units			x
840490	Parts for auxiliary plant for boilers, condensers for steam, vapour power unit	x		
840510	Producer gas or water gas generators, with or without purifiers	x		
840681	Turbines, steam and other vapour, over 40 MW, not elsewhere specified or included	x		
840682	Turbines, steam and other vapour, not over 40 MW, not elsewhere specified or included			x
840999	Parts suitable for use solely or principally with the engines of heading no. 8407 or 8408 (specifically industrial mufflers)			x
841011	Hydraulic turbines and water wheels of a power not exceeding 1,000 kW	x		
841012	Hydraulic turbines & water wheels >1,000KW <10,000KW			x
841013	Hydraulic turbines & water wheels >10,000KW			x
841090	Hydraulic turbines and water wheels; parts, including regulators	x		
841181	Gas turbines of a power not exceeding 5,000 kW	x		
841182	Gas turbines of a power exceeding 5,000 kW	x		
841459	Fans, N.E.S.O.I.			x
841480	Air/gas pumps, compressors and fans etc., N.E.S.O.I.			x
841581	Compression type refrigerating, freezing equipment incorporating a valve for reversal of cooling/heating cycles (reverse heat pumps)	x		
841780	Industrial or lab furnaces & ovens, including nonelectric, N.E.S.O.I. (specifically waste incinerators)			x
841790	Parts of industrial or lab furnaces & ovens, including nonelectric, N.E.S.O.I. (specifically waste incinerators)			x
841861	Compression type refrigerating, freezing equipment incorporating a valve for reversal of cooling/heating cycles (reverse heat pumps)		x	
841869	Compression type refrigerating, freezing equipment incorporating a valve for reversal of cooling/heating cycles (reverse heat pumps)		x	
841919	Solar boiler (water heater).	x		
841940	Distilling or rectifying plant		x	
841950	Solar collector and solar system controller, heat exchanger	x		
841960	Machinery for liquefying air or gas			x
841989	Machinery, plant or laboratory equipment whether or not electrically heated (excluding furnaces, ovens etc.) for treatment of materials by a process involving a change of temprature such a heating, cooking, roasting, distilling, rectifying, sterlizing, steaming, drying, evaporating, vaporizing, condensing or cooling.		x	
841990	Medical, surgical or laboratory stabilizers		x	
842139	Filter/purify machine & apparatus for gases, N.E.S.O.I. (including catalytic converters)			x
842199	Filter/purify machine & apparatus parts			x
848340	Gears and gearing and other speed changers (specifically for wind turbines)	x		

848360	Clutches and universal joints (specifically For wind turbines)	x		
<b>85</b>	<b>Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles</b>	<b>6</b>	<b>3</b>	<b>0</b>
850161	AC generators not exceeding 75 kVA (specifically for all electricity generating renewable energy plants)	x		
850162	AC generators exceeding 75 kVA but not 375 kVA (specifically for all electricity generating renewable energy plants)	x		
850163	AC generators not exceeding 375 kVA but not 750 kVA (specifically for all electricity generating renewable energy plants)	x		
850164	AC generators exceeding 750 kVA (specifically for all electricity generating renewable energy plants)	x		
850231	Electric generating sets and rotary converters; wind-powered	x		
850680	Fuel cells use hydrogen or hydrogen-containing fuels such as methane to produce an electric current, through a electrochemical process rather than combustion.	x		
850720	Other lead acid accumulators		x	
853710	Photovoltaic system controller		x	
854140	Photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes		x	
<b>90</b>	<b>Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof</b>	<b>2</b>	<b>2</b>	<b>0</b>
900190	Mirrors of other than glass (specifically for solar concentrator systems)	x		
900290	Mirrors of glass (specifically for solar concentrator systems)	x		
903210	Thermostats		x	
903220	Manostats		x	
	<b>Column totals</b>	<b>27</b>	<b>16</b>	<b>18</b>

Sources: Compiled by the author from World Bank (2008: Appendix 6) and USTR (2006: Annex 1)

**Annex III. Mandated Reports to Congress by Executive Agencies in Climate Change Technology Title of Energy Policy Act of 2005**

<b>Topic of Report [Section] Subtitle A</b>	<b>Who Reports*</b>	<b>To Whom</b>	<b>Initial Report Due</b>	<b>Subsequent Reports</b>
National Strategy** [1610(c)]	CCCT	President, Sec. of Energy, Public	Within 18 months after enactment	Every 5 years, or more often
Technology Inventory [1610(e)]	Sec. of Energy	Congress, Public	Not specified	“Periodically”
Barriers to Commercialization and Deployment [1610(f)]	CCTAC	CCCT	Within 1 year after enactment	Annually
Demonstration Projects [1610(g)]	CCCT	President, Congress, Public	Within 18 months after enactment	Every 5 years, or more often
<b>Subtitle B</b>				
Developing Country GHG Emitters [732(a)]	Sec. of State	Congressional authorizing and appropriating committees	Within 180 days after enactment	Update 18 months after initial report and then annually
Inventory of Technologies for Transfer to Developing Countries [733(a)]	Sec. of State and Sec. of Energy	Congress	Within 180 days after completion of Inventory in sec. 1610(e) above	None
Foreign Countries’ Trade Barriers [734(a)(1)]	U.S. Trade Representative	Not specified	Within 1 year after enactment	[None specified but annual needed for sec. 734(b)]
Foreign Countries’ Trade Barriers [734(b)]	U.S. Trade Representative	Congress	Within 1 year after report in sec. 734(a)(1)	Annually
Performance Review of Export Promotion [735(c)]	Interagency Working Group	Congressional authorizing and appropriating committees	Within 180 days after enactment	Annually

\* Full names of the reporting entities are as follows:

CCCT = Committee on Climate Change Technology

CCTAC = Climate Change Technology Advisory Committee

Interagency Working Group = Interagency Working Group for Greenhouse Gas Intensity Reducing Technology Export Initiative

\*\* Strategy “to promote the deployment and commercialization of greenhouse gas intensity reducing technologies and practices”

Source: Compiled by the author from the text of Title XVI of the U.S. Energy Policy Act of 2005

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