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The Trade and Climate Change Joint Agenda

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Thomas L. Brewer

Abstract

Climate change, international trade, investment and technology transfer are all issues that have intersected in diverse institutional contexts and at several levels of governmental activity to form a new joint agenda. The purpose of this paper is to advance understanding of this joint agenda by identifying the specific issues that have emerged, the policies that have been adopted, especially in the EU and US, and the options that are available for further policy-making.

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THE TRADE AND CLIMATE CHANGE JOINT AGENDA

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THOMAS L. BREWER*

THis paper attempts to go beyond the usual assertions about how the EU and the US regimes can be mutually supportive – which they can – to offer more tangible and detailed analyses of the actual intersections that have already begun to occur. The analytical and policy agendas arising from climate-trade intersections are much more extensive, specific and tangible than previously recognised. Further, there are some intersections that are especially problematic in the threats to the international climate and/or trade regimes, while there are others that offer opportunities for win-win outcomes – or even win-win-win opportunities if sustainable development criteria are included along with climate and trade.

Consider the following three positions:

"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."

EU Trade Commissioner Mandelson, speech on 18 December 2006

"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

"[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

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The cut-off date for the facts of this paper is 30 April 2008. Portions of the paper have been presented at a seminar at CEPS in Brussels, at the World Bank and at Georgetown University in Washington, D.C., as well as numerous other venues in Europe and the United States during 2007-08. I am indebted to the audiences for their comments.

1. Introduction

The quotations above demonstrate that climate change and trade agendas have already intersected at the international level in the context of EU and World Trade Organisation (WTO) policy-making. This paper presents suggestions that will be beneficial to climate change mitigation and/or adaptation and/or to international trade, investment and technology transfer – and to the associated international regimes. International investment and technology transfer policies are included 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 EU agenda:

- Issues that have emerged or are likely to emerge soon on the WTO agenda, including tariffs, non-tariff barriers and subsidies concerning renewable energy sources;
- Sector specific issues, particularly international aviation and maritime shipping, which are currently outside the WTO as well as the Kyoto Protocol but which are on the agendas of the EU and the post 2012 climate negotiations;
- International trade and investment issues associated with technology transfers of climate-related technologies for mitigation and/or adaptation; and
- Offsetting border measure proposals being discussed in the EU and the US as ways to address free rider, carbon leakage and international competitiveness concerns.

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 UN Framework Convention on Climate Change (UNFCCC) 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 UNFCCC 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 UNFCCC 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."

A review of the literature concerning these issues is presented in Annex I of the paper.

2. Tariffs, Non-tariff Barriers and Subsidy Issues at the WTO[1]

2.1 EU-US Proposal for Tariff Reductions on Manufactured Goods

In late November 2007, a few days before the opening of the Bali climate change conference, the EU and US jointly proposed to launch negotiations in the WTO on a list of 43 manufactured goods, with a view to eliminating tariffs on them. European Trade Commissioner Peter Mandelson had made a proposal along these lines in December 2006 (European Commission, 2006), though without specifying the products to be included.

The EU-US proposal was greeted with hostility by the Indian and Brazilian governments. There has thus been an impasse on this proposal - in the context of a larger impasse in the Doha round negotiations. Brazil has been particularly concerned about the omission of biofuels from the EU-US list, since Brazilian ethanol exports to the US face highly restrictive tariffs (see, for instance, EurActiv, 2007c). Brazil has included US subsidies of biofuels in a dispute it filed with the WTO in 2007. The National Foreign Trade Council of the US (NFTC, 2007, p.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 Subsidies and Countervailing Measures (SCM) Agreement may be one of the first WTO documents revised in overcoming this challenge."

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

The current US tariff rate for imported ethanol is 2.5% plus 14.27 cents per litre (54 cents per gallon).[2] Compared with production-plus-transportation costs for Brazilian ethanol exports to the US of approximately 15 cents per litre (as of 2005), the effective US tariff rate was equivalent to an *ad valorem* rate of approximately 100%. Data in Severinghaus (2005) indicated a $1.01 cost-insurance-freight price of Brazilian ethanol in the US; the *ad valorem* rate equivalent was thus 57% at that time.[3]

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[1] 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 (TREMs), 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 (TREMs), government R&D subsidies for investments in pilot projects in carbon sequestration (IREMs).

[2] In the Harmonized Commodity Description and Coding System (HS), 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%. Among them, India is the highest at 30% (Steenblik, 2006, 8, p. 26). The EU tariff is 5.1% and the US 4.6%.

[3] Production costs of ethanol in the US have since increased substantially because of rapid increases in the price of corn, the principal feedstock for ethanol in the US. 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, p. 140).

Of the many countries that have tariffs on imports of biofuel *feedstocks*, the US has a relatively high rate of 19% on soybean oil, which is the principal feedstock used to make biodiesel fuel in the US (Kerr and Loppacher, 2005, p.57; UK, Department of Transport, c.2003, p37).[4]

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. The US is one of the countries in the world with the highest tariffs on these two types of machines.

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 EU-US 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.[5] This possibility, however, immediately raises issues about standards and labelling 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 US corn-based ethanol in their reductions of greenhouse gas emissions. Among biodiesel feedstocks, palm oil can yield a significant net decrease or increase in greenhouse gas emissions compared with petro-diesel, depending primarily on land-use issues. (These and other issues are addressed further in the section concerning standards and labelling below.)

Tariffs on manufactured goods related to biofuels and other types of manufactured goods could also be added to the list. As Table 1 reveals, at least some of those tariffs are quite high in all three of the countries – i.e. the US as well as China and India. Further research might reveal additional kinds of climate friendly goods beyond the 43 in the EU-US list. For instance, there

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[4] A US government subsidy programme 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 known (Kram, 2007). The programme provides for a 1 cent production subsidy per percentage point of biodiesel added to a blend with petro-diesel. One or more US-based firms used the subsidy by importing biodiesel, blending it to create a 99.9% 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 transatlantic trade friction, when the European biodiesel industry and the Commission objected. By the end of 2007, there were efforts underway 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 US expressed displeasure with the continuation of the practice and noted that US biodiesel exports to the EU constituted about 15-20% of the EU market in 2007 and that the US programme thus represented a US subsidy of European drivers of approximately $300 million during the year (European Commission, Delegation to the US, 2008).

[5] The US and the EU have reportedly blocked the inclusion of biofuels in the WTO negotiations. The US has made contradictory classification arguments. It has argued that because biofuels are agricultural products, they cannot be included in the EU-US 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.

are 18 manufactured goods on the list noted above that was prepared by the US Trade Representative (USTR) for a different purpose that are not on the EU-US joint list.

Table 1. 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)

The negotiating agenda could 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 in the wind energy industry, as well as trade, are evident. 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 service industries and equipment safety inspection processes.

Because of the widespread use of subsidies in energy and agricultural policies in many other countries in addition to the US, 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, p.13 n32) that the Agreement on Subsidies and Countervailing Measures (SCM) should be revised in order to allow for "legitimate" subsidies that are undertaken for climate change mitigation.[6]

2.2 Product Labelling and Standards Issues

Issues concerning product labelling and standards in international trade have been much less prominent in the US 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.[7] The issues to date in the US 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 labelling standards on consumer products.

There have been previous WTO dispute cases against the US 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.

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[6] The National Foreign Trade Council's (NFTC, 2007: 11-14) detailed analysis of several climate and energy Congressional bills (pending or enacted)[6] in the 110th 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, p. 13). Other problems in other bills are also cited.

[7] The World Bank has launched a study of climate-related labelling and standards issues in international trade.

2.3 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 US is a signatory (NFTC, 2007, pp. 14-17). A key issue is whether provisions such as those requiring US 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, p. 17).

As for other countries, since only 12 countries[8] plus the EU 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 EU and Japan, in particular - there could be GPA-related issues that 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.

3. Sectoral Issues: 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 US-EU relations and the International Civil Aviation Organization (ICAO), and domestic legal actions within the US 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.

3.1 International and Domestic Disputes

The first international trade-climate dispute has already begun, at least informally - namely the US government's objections to the EU 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 US 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).

[8] US, Canada, China, Hong Kong, Iceland, Israel, Japan, Korea, Liechtenstein, Norway, Singapore, and Switzerland.

While the Office of the US Trade Representative has not made a formal public statement on the issue, the US Federal Aviation Administration, the US Ambassador to the EU, and a representative of the US airline industry association have been vocal about the issue. An unnamed US government representative said the EU 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 US Ambassador to the EU, 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 followed 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 EU 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 EU Emissions Trading Scheme.

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

There have also been legal cases *within* the US 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 US 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 organisations. 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 US - 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).

3.2 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 as or faster than any other sectors. From 1990 to 2004, international aviation emissions increased by 34% and international maritime emissions increased by 43%. In recent years, aviation emissions have accounted for about 2% of total world GHG emissions and international maritime shipping has accounted for about 3%. The 5%

of the world total for the combination of the two industries places them ahead of all but 5 national economies.[9]

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 and thus UNFCCC 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, p. 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 materialised, efforts outside the UNFCCC framework and outside the two industry-based international organisations 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. Although the privatisation and deregulation policies of many governments and the renegotiation of international agreements, especially in the airline industry, have reduced the subsidy and protection programmes, international competition in both industries is still relatively constrained by national and international trade policies (again outside the WTO in both industries).[10]

4. Offsetting Border Measures that Address Free Rider, Carbon Leakage, and International Competitiveness Concerns[11]

Among the climate-trade issues that have emerged to date, one of the most contentious concerns the possible use of offsetting border measures to reduce free rider, carbon leakage and international competitiveness problems. 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

[9] 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% (International Centre for Trade and Sustainable Development, 2007d, p. 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).

[10] Shipping industry price-fixing and capacity-regulating practices are coming under greater scrutiny of EU competition policy authorities (see Goliath, 2007).

[11] This section is based in part on excerpts from Brewer (2007a).

such an agreement without incurring the costs of participating in it. Moreover, the regime can be undermined by the 'leakage' of emissions, as production increases in countries that are not party to the climate regime. Further, firms may fear that their international competitive position is being undermined by lower energy prices in non-participating countries. In the US, these issues have become salient in regard to emerging economy countries (especially Brazil, China, and India).

In the EU, the issues have arisen from time to time during the past several years in regard to US non-participation in the Kyoto Protocol. The emphasis in the public discussions within the EU was initially on the possible imposition of offsetting tariffs, though the European Parliament's resolution (2005/2049) uses the generic term "border adjustment measures."[12] The European Commission's reaction to these measures was initially to oppose them on the grounds that they risked exacerbating trade relations with the US, particularly at a time when trade relations were already strained and when transatlantic relations more generally were unusually conflicted over a broad range of issues. In addition, there have been concerns that such a measure would undermine support in the US among those political and business circles that have been hoping for increased EU-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. EU Enterprise Commissioner Günter Verheugen suggested that the Commission was more favourably 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 organisations (see especially, Financial Times, 2007; and EurActiv, 2007b).

However, just before and after the release of the Commission's proposals for the extension of the Emissions Trading Scheme (ETS) on 23 January 2008, there was a specific and salient resurgence of interest. Commission President Jose Manuel Barroso explicitly mentioned the possibility in a speech (European 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.

The possibility of imposing offsetting border measures has also been noteworthy in the GHG emissions cap-and-trade legislative proposals in the US Congress. Two of the many legislative proposals introduced during 2007 are relevant. 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)

[12] 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).

was reported favourably by the Senate Environment and Public Works Committee on December 5, 2007.[13]

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 US 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.

In both bills, the proposal is to require US 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 US 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.

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).[14] 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 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 April 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

[13] The committee vote was 11 in favour and 8 opposed, with all 10 Democrats voting in favour, and 8 of 9 Republicans voting against (Sen. Warner being the exception).

[14] 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 programme 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.

largest labour unions, The International Brotherhood of Electrical Workers. It has subsequently gained the support of major business and labour organisations. However, its opposition by the National Foreign Trade Council (NFTC), whose membership includes many large and politically active US-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 US, there are of course international repercussions, including in particular hostility to the proposal in major developing country exporters to the US 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.

5. 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 institutionalised memory, that can be drawn upon in addressing such issues.

Other issues are relatively new ones 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 analytical work and negotiating experience for addressing these questions are therefore more limited.

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 UNFCCC, 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 organisation officials who implement international agreements and to the operations of business executives who conduct international transactions.

In any case, the agenda of the WTO will surely be expanded in years to come, 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 signalled 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.

The possibility of the unilateral adoption of offsetting border measures by the US, EU 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 the active involvement of the WTO to ensure its compatibility with WTO principles. Such provisions could be integrated into an umbrella multilateral climate agreement and also into any plurilateral sector-specific climate agreements that may emerge.

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.

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Annex 1. 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, see also 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).

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 EU (2007) has analysed 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 EU institutions. A report from the (US) National Foreign Trade Council (2007) has analysed WTO-compatibility and other international trade law issues concerning pending climate change legislation in the US Congress. Miller (2007) has also reviewed some of those issues.

There is already a sizable and rapidly increasing literature on international competitive issues. International competitiveness issues and how they can be addressed within the context of am emissions cap-and-trade system have been addressed by Kopp and Pizer (2007), Morgenstern (2007), and Morgenstern, et al. (2007). 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 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 US 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 to which they produce tradable products.

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. See 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).

Annex 2. Glossary of Terms and Abbreviations

CAFE	Corporate average fuel economy (standards for cars in the US)
EPA	(US) Environment Protection Agency
ERIMs	Environment Related Investment Measures
ERTMs	Environment Related Trade Measures
FDI	Foreign Direct Investment
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GHGs	Greenhouse Gas Emissions
GPA	(WTO) Government Procurement Agreement
HS	Harmonized Commodity Description and Coding System
ICAO	International Civil Aviation Organisation
IMO	International Maritime Organisation
IREMs	Investment Related Environmental Measures
MEA	Multilateral Environmental Agreement
NFCT	National Foreign Trade Council
SCM	(Agreement on) Subsidies and Countervailing Measures
TBT	(Agreement on) Technical Barriers to Trade
UNFCCC	United Nations Framework Convention on Climate Change
USTR	US Trade Representative (government body in charge of trade relations)
WTO	World Trade Organisation

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