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Climate Change Law Seminar Paper

The Costs of Carbon - examining the competitiveness and international trade dimensions of the Waxman- Markey House Bill

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ABSTRACT

As the United States considers unilateral climate change action, uncertainty exists as to the compatibility of the proposed trade related measures to global warming. This paper considers the rationale behind any trade measures designed to address competitiveness and carbon leakage following the introduction of unilateral climate change legislation (Part I). The paper then assesses the international legality of the proposed measures in the Waxman-Markey Bill under World Trade Organisation (WTO) law (Part II) and proposes alternative mechanisms that may yield economically sound solutions while remaining mindful of equitable principles (Part III).

Introduction

The scientific evidence regarding climate change is compelling. The Intergovernmental Panel on Climate Change (*IPCC*) has concluded that the warming of the Earth's climate system is 'unequivocal' and that human activities are 'very likely' the cause of this warming¹. The impacts of climate change are expected to be severe. Developing countries, and particularly the poorest and most marginalized populations within these countries, are thought to be the most vulnerable and adversely affected by the impacts of future climate change. A global and multilateral agreement is critical if climate change is to be mitigated in a post-Kyoto era. Following the negotiations in Copenhagen this month, the United States, subject to domestic and international pressure has been considering the adoption of comprehensive legislation to address Climate Change.

There is a growing consensus that a market mechanism that establishes a price on carbon is the appropriate mechanism to address climate change.² The cap-and trade system has come to dominate the world arena as the preferred system for instilling that price signal. The American Clean Air and Security Act of 2009, H.R. 2454 (the *Waxman-Markey Bill*)³ passed by the United States House of Representatives on June 26 2009 adopts such cap-and-trade regime⁴.

The United States fundamental concern in passing any unilateral regulation to reduce greenhouse gas emissions is the cost of such a measure to industry and the economy. In the international arena, the fear is focused on the 'competitiveness' of U.S firms, who will face an increase in costs of production and as such, be at a competitive disadvantage relative to foreign-made goods.

¹ Intergovernmental Panel on Climate Change, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007 B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds) Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. (Available at http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg3_report_mitigation_of_climate_change.htm)

² Jason, Furman., Jason, Bordoff., Manasi, Desphande., and Pascal. Noel., *An Economic Strategy to Address Climate Change and Promote Energy Security* (Hamilton Project Strategy Paper: The Brookings Institution October 2007); See Jason Bordoff, *International Trade Law and the Economics of Climate Policy: Economics of Climate Policy: Evaluating the Legality and Effectiveness of Proposals to Address Competitiveness and Leakage Concerns*, Climate Change, Trade and Competitiveness: Is a Collision Inevitable? (forthcoming, draft 2009)

³ American Clean Air and Security Act, H.R. 2454 (2009), (hereinafter Waxman-Markey Bill)

⁴ Although a number of other bills have been considered by the Senate (the largest and most comprehensive bill is S. 1733, Clean Energy Jobs and American Power Act, introduced by Senators Kerry and Boxer (Kerry-Boxer or CEJAPA), the Waxman-Markey was the sole climate change bill to receive full consideration in the House of Representatives and as such will be used as the case study for this paper.

The argument in favor of protecting industry is often supported by a related environmental concern of ‘carbon leakage’. In the climate change context, this refers to a chain of events whereby greenhouse gas-producing activity simply shifts from a regulated jurisdiction to an unregulated one.⁵ From an industry perspective, if a domestic policy raises the price of carbon-intensive goods, domestic production may simply relocate abroad, requiring the domestic market to import the cheaper more carbon intensive products. This has the undesired effect of undermining the policy’s effect on reducing greenhouse gas emissions in the world atmosphere. Furthermore, if industries relocate to countries where energy sources are even less efficient, it may actually exacerbate the quantity of greenhouse gas emissions produced globally.⁶ Supporters of these arguments call for restrictions placed on imported goods that compete within the domestic market.

In response to these concerns, the Waxman-Markey Bill⁷ addresses the issues of competitiveness and leakage in two primary ways. First, it provides for ‘rebate’ emission allowances to eligible trade intensive industries to compensate these sectors for the costs incurred from implementation of the Bill (*Free allocation*).⁸ Second, the Bill allows a border tax adjustment to be placed on imports from countries, in certain circumstances⁹. This additional requirement would be placed on goods from countries that have not adopted an international agreement, to which the United States is a party or a countries that do not have a separate sectoral agreement with the US (*Border Tax Adjustment*).¹⁰ Such measures, by the USA, are arguably in violation of WTO law.

This paper considers the rationale behind any trade policy measures designed to address competitiveness and carbon leakage (*Part I*). The paper also assesses the international legality of the proposed measures in the Waxman-Markey Bill under World Trade Organization (*WTO*) law (*Part II*) and proposes alternative mechanisms that may yield

⁵ Aaron, Cosbey, and Richard. Trasofsky., *Climate Change, Competitiveness and Trade*, A Chatham House Report, June 2007, 4

⁶ This is often the criticism used to support trade measures against China

⁷ hereinafter, referred to also referred to as the “Bill”

⁸ Waxman Markey, supra note 3 §763

⁹ Id. §765(f)

¹⁰ The official Bill summary as passed by the House of Representatives states (under the section of *Protection of Trade-Vulnerable and Other Industries*) Pursuant to the Inslee-Doyle program, energy-intensive, trade-exposed industries that make products like iron, steel, cement, and paper will receive allowances to cover their increased costs. The number of allowances set aside for this program will equal 15% of the allowances in 2014 and then decrease based on the percent reductions in the carbon emissions cap. These allowances will phase out after 2025 unless the President decides the program is still needed. The legislation also provides that if the United States does not join a multilateral agreement, a border adjustment for energy-intensive trade-exposed sectors will be available to the President in 2020. The President must receive a joint resolution of Congress in order to waive use of the border adjustment for these sectors”. (Available at http://energycommerce.house.gov/Press_111/20090724/hr2454_housesummary.pdf Accessed 25 October 2009).

economically sound solutions while remaining mindful of equitable development objectives (*Part III*).

I – Trade Measures to Address Climate Change – Policy Rationale

Although international trade law does not have an explicit role in climate change policy, trade measures as a tool for addressing global warming have received political support.¹¹ In addition, the role of trade in mitigating climate change has been expressly recognized by the WTO in the WTO-UNEP report, published earlier this year.¹² However, such support has not been without controversy, in particular from the developing world, which has raised concerns about the fairness and equity of trade measures and sanctions in relation to climate change. Given historical emissions and the need for further growth by developing countries to build their economies and alleviate poverty, emission reductions and climate change policies cannot be the same for each country¹³.

The idea of using trade measures to address competitiveness was first proposed by the European Union, with France and the European Parliament advocating a tax on imports from United States as a response to American abstention from serious climate change policy. The United States, at the time, deeply opposed such measures. Ironically now that the US climate policy is a serious prospect, the Waxman Markey bill includes exactly such measures.

It is well recognized that trade sanctions in the Waxman-Markey are targeted towards China and India. Historically however, the United States is responsible for about 27 per cent of all emissions in the atmosphere and the EU for 22 per cent.¹⁴ China and India, although rapidly developing, are responsible historically for only 10 and 3 percent of emissions respectively¹⁵. It is certainly undeniable, that since warming is generated by cumulative stock of greenhouse gasses in the atmosphere, the developed world has a greater responsibility for addressing the issue.

¹¹ *Trade and Climate Change*, A report by the United Nations Environment Programme and the World Trade Organization, WTO Secretariat, Geneva, Switz., DTI/1188/GE, 2009. (hereinafter WTO-UNEP report) citing the US and France as examples.

¹² Id.

¹³ This principle was recognized at Copenhagen this year by President Obama who in stated “We need more work, more confidence building between emerging economies, the least developed countries and developed countries before another legally binding treaty can be signed,” Barack Obama; *Obama: A binding deal is still our goal*: 19 December 2009, United Nations Climate Change Conference News, Morten Anderson available at <http://en.cop15.dk/news/view+news?newsid=3072>

¹⁴ Historical share of cumulative CO2 emissions by country from 1950 to 2004 as provided by the World Resources Institute, Climate Analysis indicators tool (CAIT) Version 5.0 (2008) as cited by Hufbauer GC., Charnovitz S and Kim J in *Global Warming and the World Trading System*, Peterson Institute for International Economics (2009).

¹⁵ Id.

Consequently, the United Nations Framework Convention on Climate Change (*UNFCCC*) does not envisage trade sanctions and recognizes the ‘common but differentiated responsibilities and respective capabilities, as well as varying the social and economic conditions’ of its members.¹⁶ Article 4.2 of the Convention reinforces that ‘measures taken to combat climate change should not constitute a means of arbitrary or unjustifiable discrimination or disguised restriction on international trade’.

Furthermore, the Kyoto Protocol in Article 2.3 states that parties ‘should strive to implement policies and measures...in such a way as to minimize adverse effects, including adverse effects on international trade. The WTO itself is reluctant to allow trade sanctions as a means to force other countries to follow one’s own preferred policies thereby respecting the principle of state sovereignty and reflecting concerns about extraterritorial measures.’¹⁷

In the light of this background, any trade measure applied by the US in the Waxman-Markey Bill must be exercised carefully, particularly in light of these genuine concerns of the developing world. If exercised imprudently, such measures may further exacerbate the already embedded sentiment held by developing nations that they are being treated inequitably in climate change negotiations. By using the ‘stick’, rather than the ‘carrot’ approach, the negotiation climate needed for an international accord may be damaged, making necessary global action even more difficult to achieve.

1.II Competitiveness and leakage concerns

One of the major cited obstacles toward passing the Bill and setting a limit on greenhouse gas emissions is the impact on US firms. It is said that, where foreign firms do not bear a similar cost, US firms may lose their competitive edge and relocate or simply go out of business. In particular, goods from countries without mandatory carbon restrictions – such as China, Brazil or India – may gain a price advantage over US goods.¹⁸ It was precisely this asymmetry that led the US Senate to reject the Kyoto protocol¹⁹.

¹⁶ UNFCCC Acknowledged that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions; statement available at <http://unfccc.int/resource/docs/convkp/conveng.pdf>

¹⁷ Article XX of General Agreement on Tariffs and Trade, Oct. 30, 1947, 61-Stat. A-11, 55 .U.N.T.S 1994 (hereinafter *GATT*); See discussed by Richard Quick, *Border Tax Adjustment’ in the Context of Emission Trading: Climate Protection or ‘Naked’ Protectionism*, *Global Trade and Customs Journal*, 3, 5 (2008)

¹⁸ Pauwelyn, J., *US Federal Climate Policy and Competitiveness Concern: The Limits and Options of International Trade Law*, Nicholas Institute for Environmental Policy Solutions, Duke University Working Paper (2007).

¹⁹ Id.

In particular, the trade measures in the Bill seek to target China and India whose goods, the US fears, will be the most competitive with US goods both on the domestic and world markets. The effect of such competition would be most felt by energy-intensive manufactures such as the iron, aluminum, cement and paper industries.²⁰

The main arguments raised in favor of a competitiveness provision centers around three basic rationales:

(1) The *economic/employment* argument calls for any US policy to ‘level the competitive playing field’ by imposing the same costs on imports as climate change legislation would impose on US production. This would force overseas producers to internalize the social costs of carbon²¹, while preventing industries from relocating, avoiding any loss of domestic employment.

(2) From an *environment* perspective, a competitiveness provision it is argued will prevent carbon leakage and reduce overall emissions.

(3) Finally, such a clause will, according to its supporters, *incentivize foreign governments* to pass equivalent domestic legislation, as companies abroad who trade with the US will aim to reduce their emissions. Arguably, the mere threat of the enactment of these provisions may create the additional impetus required for countries like China to reduce their emissions.²²

Each rationale is examined in turn below.

III.1 Economic rationale and protecting employment

Concerns were expressed that following any unilateral climate change action, the US economy may suffer from a loss of investment, market share and employment in industrial sectors sensitive to the additional cost of reducing carbon emissions. The aim of the proposed measures is to avoid putting US carbon-intensive manufacturing industries at a competitive disadvantage, vis-à-vis countries without similar climate policy.

Importantly, this debate is taking place against the backdrop of heightened anxiety over globalization and US-China trade in particular. The US-China bilateral trade deficit has grown from \$40 billion to \$250 billion in the past decade, promoting congressional

²⁰ As described in Waxman Markey, *supra* note 3

²¹ See Nicholas Stern, *The Economics of Climate Change: The Stern review*, 368 (Cambridge University Press) (2006); As the Stern reports notes, climate change is the greatest and widest ranging market failure ever seen, Executive Summary, available at http://www.hm-treasury.gov.uk/media/8AC/F7/Executive_Summary.pdf. This is due to the fact that carbon emissions produce social costs and harm which are not calculated into the actual cost of goods. According to the report, to properly internalize the costs, a price of \$85 per tone of CO₂ would be required.

²² Pauwelyn, *supra* note 18 at 5

hearings, new legislation, and trade complaints lodged both domestically and with the WTO.²³ Policy makers in the US clearly have China in mind when considering the use of trade measures.

However, in 2007 imports from China made up on average only about 11 percent of US carbon-intensive imports groups.²⁴ As Houser notes, out of the four most trade exposed industries, only 14 percent of cement, 7 percent of steel, 3 percent of aluminum, 4 percent of paper and less than 1 percent of basic chemicals' imported into the United States was imported from China.' Rather, trade data shows that Canada is the largest source of imports in all carbon-intensive industries, followed by Europe and Russia. These countries emit considerably less carbon than the United States either on a national basis or on a per capita basis. Since in the Waxman Markey Bill, the BTA provisions are imposed in circumstances only where a trade partner has not enacted similar domestic climate policy 'comparable' to the United States, Europe and Canada, as the two largest sources of carbon intensive imports 'would likely pass this test with flying colors.'²⁸

Furthermore, among developing countries that are less likely to have adopted 'comparable policy' at home, many have industries that are cleaner, on average, than those in the United States. As opposed to relatively carbon-intensive Chinese producers, firms in Latin America have newer and more efficient equipment and use low-carbon energy sources like hydropower and natural gas. Ironically, 'leveling the carbon playing field' via trade measures may actually put some industries in the United States at a competitive disadvantage.³⁰

In addition, shielding certain carbon-intensive industry to protect one section of the economy, will perhaps do so at the expense of tax-payers, consumers or downstream industries. The fiscal costs required to protect industry may also detract from investment in infrastructure, education and research and development.

²³ Trevor, Houser., Rob, Bradley., Britt, Childs., Jacob, Werksman., and Robert, Heilmayr, *Leveling the Carbon Playing Field*, Peterson Institute for International Economics and the World Resource Institute (forthcoming) 2009; Manufacturing companies and industrial unions have expressed concerns about a further strain on industries already under significant cost pressure; see Andrew G Shakey III, American Iron and Steel Institute, statement before the Environment and Public Works Committee, US Senate, November 13 2007; Robert C Baugh, executive director AFL-CIO Industrial Union Council and chair, AFL-CIO Energy Task Force, testimony before Environmental and Public Works Committee, US Senate November 13, 2007.

²⁴ Combining the five main product groups - 15% of steel imports, 6% of US aluminum imports, practically no US chemical imports, 12 % of US paper imports and 19 percent of US cement imports; US International Trade Commission, Interactive Tariff and Trade Database, available at <http://databaweb.usitc.gov> (accessed on 15 December 2009)

²⁸ Id.

³⁰ Id. Hufbauer et al use the following example " United States may impose a carbon tax or India citing an exceptionally high level of carbon emissions per ton of Indian rebar production. In turn, India might impose a duty on all imports from the United States, citing the exceptionally high figure of US per capita CO2 emissions compared with the world average' at 13.

From an employment perspective, the fear of industry relocation appears to be over-stated. Industries make a decision to relocate based on a variety of factors. Carbon costs are to be considered along side other business concerns including; exchange rate fluctuations, transportation costs, energy prices and differences across countries in the cost of labor.³¹ Studies done to date have generally found that the effects on industry of environmental regulation, including climate change policies, are relatively small because the costs of regulatory compliance are proportionately a minor component of a firm's overall costs³².

Lastly, free allocation of allowances policy under the Bill may compensate investors, but may not achieve the underlying aim of protecting output and employment levels and reducing emission leakage. "Profit-maximizing manufactures who receive free allowances would likely raise prices to reflect the cost of purchased allowances regardless of whether they receive free allowances or not because of the opportunity cost of holding free allowances that have value in the market."³³ As such, the trade measures proposed under the Waxman-Markey may do little to protect domestic employment levels.

1.II.2 Environmental rationale

The fear of carbon leakage may be over-stated. A study by McKibben and Wicoxen concluded that trade measures would 'produce little in the way of environmental benefits since only six percent of total U.S emissions come from carbon-intensive manufactured imports.'³⁴ Most domestic carbon emissions occur in the electricity generation and local and regional transportation sectors, which are relatively unaffected by

³¹ See Jaffee, A.B., Peterson, S.R., Portney, P.R., and Stavins, R.N. *Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?* Journal of Economic Literature, 33, 132-163 (1995); Harris, M.N. Konya., and Matyas, L. *Modeling the Impact of Environmental Regulations on Bilateral Trade Flows: OECD, 1990-96*, The World Economy, 25L3, 387-406 (2002); Xu, X., *International Trade and Environmental Regulation: time series evidence and cross section tests*, *Environmental and Resource Economics*, 17:3, 233-257 (2000); Cole, M.A. and Elliott, R.J.R, *Do environmental regulations influence trade patterns? Testing old and new trade theories*, The World Economy 26:8, 1163-1186 (2003b); Hoerner, J.A. and Muller, F., *Carbon taxes for climate protection in a competitive world*, A paper prepared for the Swiss Federal Office for Federal Office for Foreign Economic Affairs by the Environmental Tax Program of the Center for Global Change, University of Maryland College Park, 47 (1996); Reinaud, J., *Issues Behind Competitiveness and Carbon Leakages, Focus on Heavy Industry*, IEA Information Paper OECD/IEA (2008) and Reinaud, J., *Industrial Competitiveness under the European Union Emissions Trading Scheme*, IEA Information paper (2005). Some other studies have found significant effects on trade flows, see Ederington, J., and Minier, J. *Is environmental policy a secondary trade barrier? An empirical analysis*, Canadian Journal of Economics 36:1, 137-154 (2003); WTO-UNEP report, supra note 11 at 103

³² Id.

³³ Houser et al, supra 23 at p 21. Theoretically, profit-maximizing firms will price their goods based on this market-based allowance price, regardless of whether they receive the allowance for free and this are vulnerable to a decline in market share in the face of international competition. This preference for profits over market share would result in a decline in domestic production and output levels over time

³⁴ Warwick J. McKibbin, Martin T. Ross, Robert Shackleton Peter J. Wilcoxen, *Emissions Trading, Capital Flows and the Kyoto Protocol*, Brookings Institution, Washington, D.C. (1999) Additionally according to some studies, China is already working aggressively to curb the growth and improve the efficiency of its carbon-intensive industries, out of local environmental and local energy concerns; see Houser et al, supra note 23 (a tax policy action taken to date in China, are equivalent to the imposition of a \$50 ton carbon tariff applied to exports of Chinese steel).

international trade.³⁵ As such, any border measures would impact only a small number of emitters. Furthermore, using the free allocation may help existing producers keep older, dirtier domestic production processes in operation while making it more difficult for new companies to bring cleaner production techniques to the market.³⁶ Arguably, alternate use of government revenue may do more to protect the environment and guard against loss of competitiveness than any proposed trade measure.

1.II.3 Incentivizing governments

The threat of losing access to the US market for carbon intensive goods may provide little leverage in inducing a change in China's climate change policy. While China accounts for 32 percent of global steel production, only 8 percent was exported in 2005. More importantly, only one percent was sold to the United States. The US market accounts for 3 percent of Chinese aluminum production, 2 percent of paper production and less than 1 percent of both basic chemicals and cement. Given the small market share held by China, it is certainly not obvious that the strength of its US market share will create substantial leverage for the United States to shape Chinese greenhouse gas policies.

Finally, most of the demand for carbon-intensive products originates from developing countries and China in particular. Since the United States accounts for only ten percent of global demand in the five most carbon intensive industries, the imported share of which accounts for less than 3 percent, it is difficult to assert that the threat of losing market share in the US is a sufficient enough incentive for developing countries to change their domestic policies.³⁷

In conclusion, the rationale used to push for trade measures to address climate change related concerns are questionable. The effectiveness of free allocation in preventing industry migration must be carefully investigated because its costs, in terms of forgone fiscal revenue could be considerable. In addition, providing free allowances to existing producers can help keep older, dirtier domestic production processes in operation while making it more difficult for new companies to bring cleaner production to the

³⁵ In practice the most important mechanism through which leakage would occur would be through world oil markets and not trade in manufactured goods. A sufficiently large carbon tax in a major economy would lower global oil prices and lead to higher consumption in countries with little or no carbon tax; see Warwick, J. McKibbin and Peter, J. Wilcoxon, *The Economic and Environmental Effects of Border Tax Adjustment for Climate Policy*, Brookings Trade Forum 2008/2009

³⁶ Houser, supra note 23 at 22

³⁷ Id.

market.³⁸ The BTA measure does not appear to provide real incentive for foreign governments to adopt equivalent policies and protects only a few industries. Finally, the use of trade measures raises genuine legality concerns under WTO law.

II - Compliance with WTO rules

Generally, under WTO law, protecting domestic producers from foreign competition is not recognized as a legitimate policy objective. Rather, US policy makers will be required to demonstrate that the trade measure has been designed to achieve greenhouse gas reductions.³⁹

II.1 Free Allocation

The Bill attempts to soften the impact of the legislation on the US industries particularly exposed to carbon and job leakage. This is achieved by the allocating free allowances under section 763 to energy intensive trade exposed industries (*EITE*).⁴⁰ Lowering the cost of carbon domestically will ensure that industries are able to compete with overseas counterparts that are not subject to equivalent legislation.

Free allocation is a complex and contentious issue under the cap-and-trade system but has been widely adopted by countries with a cap-and-trade scheme.⁴¹ Free allocation may, however, prove non-compliant with WTO law if deemed an illegal subsidy. As certain industries will be receiving some economic value for free, a question arises, whether under the normal course of trade, by virtue of section 763 of the Bill, the US government is conferring certain US industries a subsidy.⁴²

Whether free allocation of an emission allowance is a subsidy does not have a clear answer and has not been addressed under WTO jurisprudence, although the issue has been considered by various scholars⁴³.

In accordance with the WTO Agreement on Subsidies and Countervailing Measures (*SCM* Agreement), free allocation would be a subsidy if it (1) were a 'financial

³⁸ Id.

³⁹ Houser, supra 23 at 31

⁴⁰ Under section 763 some of the US economic operators will receive rebates (that is they will be allowed extra emission rebates without having to buy a right to do so) Waxman Markey, supra note 3.

⁴¹ The US is not alone in designing a regime with free allocation of allowances. In the EU ETS in 2006 almost all allowances were allocated for free. Indeed, under the proposed Australian emission scheme free allocation is also contemplated Carbon Pollution Reduction Scheme

⁴² Petros, C Mavroidis, *Take Waxman-Markey to the WTO Court*, presented paper (draft), 4, 2009

⁴³ Lodefalk, M., and Storey, M., *Climate Measures and WTO Rules on Subsidies*, Journal of World Trade 39:1, 23-34 (2005)

contribution' by the government⁴⁴; (2) conferred a 'benefit'⁴⁵ and (3) was 'specific' to certain industries or sectors.⁴⁶ A subsidy is only actionable under WTO law if it causes adverse effects to WTO Members.⁴⁷

To determine whether Section 763 qualifies as a subsidy, as defined under Articles 1 and 2 of the SCM Agreement, each of the requirements is considered below.

II.1.1 Financial Contribution

Free allocation of allowances⁴⁸ will be considered a financial contribution, if considered a "direct transfer of funds, such as grants, loans and equity infusions."⁴⁹ It has been argued that the 'direct transfer of funds' definition of financial contribution may include government emission permits that are converted to cash through a government-approved auction.⁵⁰ Furthermore, a 'fiscal incentive' where revenue that is 'otherwise due' is forgone or not collected' is also a financial contribution⁵¹. Therefore, freely allocated emission allowances may constitute a direct transfer of funds as they are 'functionally equivalent to distributing cash' because allowances can be sold for a monetary value on a liquid secondary market, created and enforced by the government.⁵³

II.1.2 Conferring a benefit

Although, free allocation may be used to promote public policy objectives, the granting of an allowance would certainly meet the 'benefit' requirement of the SCM Agreement. Under Article 14(d)⁵⁴, the provision of goods and services by the government confers a benefit if the provision is made for less than adequate remuneration under prevailing market conditions. Since the emission allowance could be traded on the open market and carries a market price, a benefit is conferred when the government, freely distributes the

⁴⁴ Art 1 SCM Agreement, Agreement on Subsidies and Countervailing Measures, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization (hereinafter WTO Agreement), Annex 1A, Legal Instruments—Results of the Uruguay Round, 33 I.L.M. 1125 (1994) (hereinafter SCM Agreement).

⁴⁵ Id.

⁴⁶ SCM Agreement Art 2; SCM Agreement Art 1.1 and 1.2, supra note 44

⁴⁷ SCM Agreement Art 5. Bordoff suggests that in addition to being an 'actionable' subsidy if it causes adverse effects, a claim may also be made that it constitutes a 'prohibited' export-contingency subsidy, which is forbidden per-se. SCM Agreement Art 3. While a subsidy may be prohibited if it is contingent de facto or de jure on export, Appellate Body Report, Canada-Measures Affecting the Export of Civilian Aircraft, WT/DS70/AB/R/, 2 August 1999 at para 167, export orientation alone is not enough; the subsidy must be 'in fact tied to actual or anticipated exportation or export earnings'. SCM Agreement n. 4; Supra note 44; Bordoff concludes that Free allocation to carbon intensive industries is unlikely to meet that test; see Bordoff, supra note 2

⁴⁸ Under the Waxman Markey in the form of a rebate s 763, supra note 3

⁴⁹ SCM Agreement Art 1.1(a)(1)(i) and (iii), supra note 44

⁵⁰ de Centra, Javier., *Can Emissions Trading Schemes be Coupled with Border Tax Adjustments? An analysis vis-à-vis WTO Law*, Review of European Community and International Environmental Law 15:2, (2006) at 137.

⁵¹ SCM Agreement Art 1.1(s)(1)(i), supra note 44

⁵³ Congressional Budget Office, Cost Estimate, s 2191: America's Climate Security Act of 2007 (April 10 2008) available at http://www.cbo.gov/ftpdocs/91xx/doc91921/s2191_EPW_Amendment.pdf

⁵⁴ SCM Agreement

allowance. Hence, as stated by Mavroidis “under section 763, the US government will be paying itself the rebates and a benefit will thus be conferred on the recipients, who will be procuring for free what that they should have paid for.”

II.1.3 Specificity

A subsidy, however, is not subject to the SCM Agreement unless it has been specifically provided to an enterprise or industry (or group of enterprises or industries).⁵⁵ It is generally accepted that the outcome of any legal challenge on this issue will depend on the argument regarding the specificity requirement.⁵⁶

The basic principle is that a subsidy that distorts the allocation of resources within an economy should be subject to discipline. Where a subsidy is widely available within the economy, such a distortion in the allocation of resources is presumed not to occur. Thus, only “specific” subsidies are subject to the SCM Agreement disciplines.

Some scholars have suggested that since rebates (free allocation) are granted to a few energy intensive sectors they may be challenged under the *de jure* specificity requirement of the SCM Agreement.⁵⁷ However, it appears difficult to assert that the rebates are *de-jure* specific, since the Waxman Markey bill does not mention by name the beneficiaries and the criteria in section 763 is arguably neutral.⁵⁸

However, even if a subsidy is *de jure* non-specific it may be deemed *de facto* specific, if, for example, certain enterprises benefit disproportionately. This may occur where using explicit criteria, such as gas and trade intensity, leads to the conclusion that the subsidy programme is used only by a limited number of specific enterprises.

The case of *Dutch Flowers*⁵⁹ provides one such example. In this case a subsidy scheme nominally available to all agricultural producers, which was not *de jure* specific,

⁵⁵ Art 21(b) SCM Agreement; supra note 44; If a WTO Member established objective criteria or conditions and grants subsidies based on such terms, the subsidy will, in principle not be considered specific. Objective criteria or conditions are defined as conditions which are neutral, which do not favor certain enterprises over others and which are economic in nature and horizontal in application. Such as the number of employees and size of enterprise. See Mavroidis, supra note 42 at 9

⁵⁶ Mavroidis, supra note 42

⁵⁷ Three types of subsidies are deemed to be specific per se under Art 2. These include (1) export subsidies, (2) local content subsidies and (3) subsidies which are limited to certain enterprises located within a designated geographical region within the jurisdiction of the granting authority. Therefore to the extent that free allowances are targeted at specifically defined sectors adversely affected by carbon price, they would likely be considered specific. Zhong, X, Zhang, and Lucas, Assuncao., *Domestic Climate Policies and the WTO*, Blackwell Publishing Ltd (2003)

⁵⁸ Mavroidis, supra note 42 at 8

⁵⁹ Final Affirmative Countervailing Duty Determination: Certain Fresh Cut Flowers from the Netherlands, 52 FR 3301 (Feb 3, 1987) (hereafter Dutch-Flowers)

was deemed de facto specific because horticulture firms received 50% of the subsidy while accounting for only 24 % of Dutch agriculture production.⁶⁰

Article 2(1) of the SCM Agreement sets out factors to consider in determining de-facto specificity:

- (a) use of a subsidy programme by a limited number of certain enterprises;
- (b) predominant use by certain enterprises;
- (c) the granting of disproportionately large amounts of subsidies to certain enterprises;
- and
- (d) the manner in which discretion has been exercised by the granting authority in the decision to grant a subsidy.

Arguably, if all allowances were distributed using objective criteria, for example based on historical emissions, it would be difficult to assert that the free allocation of allowances constitutes a subsidy.⁶¹ On the other hand, allocation to EITE industries may fall foul of this definition since it targets a ‘sufficiently discrete’ segment of United States businesses.⁶³

However, as argued by some scholars, all US companies are eligible for rebates if they meet the gas-and trade intensity criteria. As such, the subsidy is not limited to a number of enterprises or predominantly used by certain industries.⁶⁴ It is also currently difficult to determine if the rebates will disproportionately benefit or be channeled to specific industries.⁶⁵ Furthermore, there appears no discretion involved by the granting authority. All economic operators that are eligible will receive rebates⁶⁶. Therefore, without further details as to the exact process for distribution of the allowances, a WTO challenge under the SCM agreement appears difficult to substantiate as it fails to meet the specificity requirement.

⁶⁰ Id. See Parker, L., *Carbon Leakage and Trade: Issues and Approaches*, Congressional Research Service, Report R401000,40 (2008)

⁶¹ Bordoff, supra note 2 at 24

⁶³ Appellate Body Report, Final Countervailing Duty Determination with Respect to Certain Softwood Lumber from Canada IV WT/DS257/Ab/RW (hereafter US – Softwood Lumber) at paragraph 7.151

⁶⁴ A successful complainant may need to demonstrate that the gas-and trade-intensity criterion leads to a predominant use by certain enterprises. This concept has not been considered by a WTO panel and remains undefined. Mavroidis notes that a complainant would need to demonstrate that because of the design of the law, some companies will always profit more than others. In doing that, it will have to establish that the mean (average use) and show why (at this stage, that is before the eligibility lists have been shown) certain companies will always make predominant (as opposed to average) use of the rebates. Mavroidis, note 42 at 14

⁶⁵ This is because, at this stage, the complainant, will be challenging the consistency of the legislation as such and not a particular application. At a later stage, when a list of eligible entities exists a member will be able to bring a challenge against particular application.

⁶⁶ Mavroidis, supra note 42

II.1.4 Would it be Actionable?

Furthermore, even if the allocation of allowances was considered a subsidy, the SCM Agreement makes a distinction between actionable and prohibited subsidies: whereas the later is illegal per se, the former is not.⁶⁷ Section 763 does not fall into the category of prohibited subsidies since it does not meet either of the two requirements in Article 3 of the SCM Agreement⁶⁸.

Consequently, the only challenge to section 763 may arise if the subsidy is ‘actionable’ under WTO rules. For a program to be an ‘actionable subsidy’, it must cause ‘adverse effects to the interests of another WTO member.’⁶⁹ The most likely way in which free allocation may be found to do so would be if it caused ‘serious prejudice’ because the ‘subsidy displaces or impedes imports of like products of another Member in the market of the subsidizing Member’.⁷⁰

The US may argue that the subsidy is part of a larger program imposing onerous domestic regulation and is, therefore, non-actionable. The WTO has not as of yet determined the baseline against which displacement or effect should be measured⁷¹ and this argument may carry insufficient weight with the Appellate Body since environmental regulation is no longer an exception under the SCM Agreement.⁷² Burdensome environmental regulation, therefore, is unlikely to preclude environmental subsidies from being actionable.

Another argument that may be raised by the US suggests that in fact free allocation should not change a firm’s pricing and output decisions, and thus foreign firms should not see their sales reduced by artificially suppressed prices for U.S goods.⁷³ Indeed, in Europe, which gave allowances away for free, consumers still saw electricity prices rise and fall

⁶⁷ The remedy for prohibited subsidies requires that they are immediately withdrawn. Article 3 of the SCM Agreement includes two categories of prohibited subsidies: local content and export subsidies; supra note 44.

⁶⁸ Domestic subsidy rebates will be granted irrespective of whether local content is used and are not conditional upon the exportation of the product under the Bill.

⁶⁹ SCM Agreement Art 5; supra note 44

⁷⁰ SCM Agreement Art 6.3, supra note 44.

⁷¹ Hufbauer, supra note 14 at 63

⁷² The original SCM Agreement specifically declared certain environmental subsidies as non-actionable. Unfortunately the WTO exception permitting environmental adaptation and general research subsidies has expired SCM Agreement Art 8.2 (Among the non actionable subsidies were grants to promote adaptation of existing facilities to new environmental requirements imposed by laws “which result in greater constraints and financial burdens on firms...”).

⁷³ Bordoff, supra note 2 at 24, As discussed above, free allocation of allowances does not exempt firms from the carbon price signal created by a cap and trade system. Rather, it acts as a transfer of resources from the government to the recipients. Even if firms received allowances for free, they will still pass along the opportunity cost of using those allowances to their customers in the form of higher prices. See Cong. Budget Office, *Shifting the Burden of a Cap and Trade Program* (2003)

with the market value of allowances, while firms reaped windfall profits.⁷⁴ This argument asserts that free allocation may not adversely affect other WTO Members or be illegal under WTO law, precisely because it would be ineffective in protecting US industries and workers and would merely compensate shareholders.

Despite such claims, WTO members could insist that even if output and pricing decisions are unchanged, they suffered a ‘serious prejudice’ because free allocation has allowed their competitors to invest in R&D or because they have forgone other indirect benefits.

It is difficult to assess the legal legitimacy of such arguments in the absence of WTO guidance on the issue. However, there is strong reason to suspect that a WTO panel would find free allocation consistent with WTO principles given the specificity requirement previously discussed.

II.1.5 Consequences and remedies

Even if free allowances were deemed a subsidy, a WTO member affected may have limited recourse. When a specific subsidy causes injury to the import-competing domestic industry producing a like product, the importing country may impose a countervailing duty on the imported product.⁷⁵ It may also challenge the compliance of the domestic subsidy with the WTO rules before a WTO panel and eventually manage to have the scheme reduced or even withdrawn.

If a countervailing duty is imposed on one of the US industries that are eligible for rebates under Section 763, the US will nevertheless be able to retain its policies. Before such a measure can be instituted, the WTO Member must first challenge the consistency of the measure before a WTO panel.⁷⁶

Although, there is a possibility that the Bill’s free allocation/rebate provisions may be inconsistent with WTO rules (if considered de facto specific and causing injury or serious prejudice to the economic interests of foreign competitors) any such argument

⁷⁴ Bordoff, supra note 2 at 24. Firms set prices based on market forces, such as marginal costs and demand that do not change even if firms received a cash transfer from the government.

⁷⁵ Under Article 15.1 of the SCM Agreement injury is based on positive evidence and involves an objective examination of both (a) the volume of the subsidized imports and the effect of the subsidized imports on prices in the domestic market for the products and (b) the consequent impact of these imports on the domestic producers of such products; supra note 444; see Zhang, note 57 at 263; A country may ultimately require countervailing duties on subsidized imports found to have injured domestic producers in the importing country

⁷⁶ The US may be required to change its policies to comply with a ruling of the Panel.

hinges on the technical characteristics of the eventual beneficiaries and is difficult to ascertain at this stage.

However, a lack of adverse effects on other member may mean that the even if the rebates are a subsidy, they are not actionable by other WTO Members. This may be particularly relevant if most countries instituting cap and trade regulation are themselves freely allocating allowances or providing rebates.

Free allocation of allowances may not ultimately be inconsistent with WTO law but it does represent a large cash transfer to domestic firms, while potentially doing little to reduce job losses in affected sectors.⁷⁸ A question arises whether a better approach may be to auction allowances and use the revenue to assist workers transition to ‘greener jobs’ that new investment incentives will create as opposed to aim to benefit shareholders.⁷⁹ Furthermore, auction revenue can offset the distributional impacts of a carbon price through progressive tax policy, reduce other discretionary taxes and permit greater investment in environmental research and development. Arguably, this is a more effective way to spend government revenue. Such policy proposals are further discussed in section III of this paper.

II.2 Border Tax Adjustment

The second trade option considered by the Waxman Markey bill imposes carbon costs on imports to level the economic playing field, thereby also avoiding carbon leakage.⁸⁰

Under a cap-and-trade scheme, this requirement can be achieved by mandating importers to hold emission allowances corresponding to the embedded carbon in their products⁸¹. This type of trade policy it is argued incentivizes other countries to reduce their greenhouse gas emissions, protecting the global commons.⁸²

⁷⁸ As discussed above, free allocation of emissions, protects profits more than employment levels. Houser et al, supra note 23 at 15; Bordoff, supra note 2 at 26 To some extent, job losses may be an inevitable consequence of reduced demand for carbon-intensive goods, which is a key purpose of the price signal

⁷⁹ Id.

⁸⁰ Section 765(f)(f), supra note 3

⁸¹ Houser, supra note 23 at 30

⁸² Waxman Markey Section 767 (b)(a), supra note 3; UNEP-WTO report, supra note 11 at 101. Importers would have to submit emission allowances or certified emission credits to cover the emissions created during the manufacturing process if the imported good; or they would be allowed to purchase allowances in the domestic emission trading markets on equal terms with domestic industries; see Janzen, B.G., *International Trade Law and the Carbon Leakage Problem, Are Unilateral U.S Import Restrictions the Solution? Sustainable Development Law and Policy, Winter*, 23(2008); Ganasci, M., *Border Tax Adjustment and Emission Trading: The Implications of International Trade Law for Policy Design*, Carbon and Climate Law review 1 (2008) 41; Saddler H., Muller, F and Cuevas C. *Competitiveness and Carbon Pricing. Border adjustments for greenhouse policies*, The Australian Institute, Discussion Paper 86 (2006); and Pauwelyn, J., *US Federal Climate Policy and Competitiveness Concerns: the Limits and Options of International Trade Law*, Nicholas Institute for Environmental Policy Solutions, Duke University Working Paper (2007).

The application of trade rules to this measure has become a topic of much debate and criticism. Problematically, a cap and trade scheme is not strictly imposing a tax on importers. In response, a number of authors have argued that the price paid by an industry to participate in an emission trading scheme (in the form of an obligation to hold emission allowances) could qualify as an ‘internal tax’ under GATT Article 3.2.⁸³ As such, it may be comparable to a carbon/energy tax for the purpose of introducing border tax adjustment.⁸⁴ Accordingly, GATT and WTO rules on border tax adjustment are relevant in determining the legality of the proposed measure.⁸⁵ A border tax adjustment (*BTA*) - a levy (direct or indirect) on imported goods - is only permissible in limited circumstances.

II.2.1 Free allocation an obstacle to border tax adjustment

The key argument for BTA is that a cap-and-trade scheme is the economic equivalent of an emission tax, since both induce an emission price.⁸⁶ However, free allocation may prove an obstacle to such a contention.⁸⁷ Taxes are in nature ‘compulsory, unrequited payments’ to the government.⁸⁸ In the case of free allocation, no payment is made to the government and thus the definition of ‘allowances’ does not conform to the notion of a tax.⁸⁹

Moreover, the mere fact that a regulation increases the price of a product cannot, in and of itself, be sufficient justification for BTA. This prevents an argument, for example, that a ‘higher minimum wage’ in the United States, as opposed to China, which also increases the cost of products, may be adjustable at the border. To prevent this ‘slippery

⁸³ Pauwelyn, *Id* at 21; de Cendra, *supra* note 50 at 135

⁸⁴ For example on indirect taxes may be adjusted at the border. Indirect taxes are taxes that can be passed on to consumers. There is a real question as to whether a carbon tax could be regarded as an adjustable product tax (that is an indirect tax) or would it be classified as a producer tax (a direct tax). Pauwelyn argues that a carbon price is intended to internalize the social costs of carbon and is therefore shifted to consumers. Hence it should be capable of being adjusted at the border. Mavroidis on the other hand, states it is unlikely that a panel would classify a carbon tax as a producer tax adjustable at the border. Pauwelyn *supra* note 82; Mavroidis, *EAERE climate conference in Gothenburg July 2008, cited in Climate Measures and Trade; Legal and Economic Aspects of Border Carbon Adjustment*, Kommerskollegium National Board of Trade 2, Sweden (2009)

⁸⁵ *Id.*

⁸⁶ See Fischer, C., and Fox, K. A., *Comparing Policies to Combat Emission Leakage: Border Tax Adjustment versus Rebates*, Discussion Paper, National Board of Trade (2008); Dorge, Susanne et al., *National climate change policies and WTO law: a case study of Germany's new policies*, World Trade Review (2004)

⁸⁷ According to some authors, how allowances are allocated in an emission-trading scheme will determine if it is classified as a tax; see de Cendra, *supra* note 50.

⁸⁸ OECD Note on the Definition of Taxes by the Chairman of the Negotiation Group on the Multilateral Agreement on Investment (MAI) (DAFFE/MAI/EG (96)(3), April 1996 at 1

⁸⁹ see de Cendra, *supra* note 50. De Cendra concludes that only a trading scheme in which emission rights are auctioned are sufficiently comparable to a domestic tax. Other scholars do not consider an emission trading scheme to be equivalent to an internal carbon tax and doubt if such a wide interpretation of ‘tax’ would be upheld in a WTO dispute. see Howse, R., and Eliason, A., *Domestic and International Strategies to Address Climate Change: An Overview of the WTO Legal Issues*, International Trade Regulation and the Mitigation of Climate Change, ed. Tomas Cottner, Sadeq Bigdeli and Olga Nartova, Cambridge, UK: Cambridge University Press (2008); Beriman, F, and Brohm R., *Implementing the Kyoto Protocol without the USA: The Strategic Role of Energy Tax Adjustments at the Border*, Climate Policy 4, 289-302 (2005).

slope' a close nexus is required between the regulation and the product.⁹⁰ Certainly, it would less raise WTO legality issues if a carbon tax was adopted on all domestic products as opposed to a cap-and-trade scheme.⁹¹

Even if, despite free allocation, an emission-trading scheme can be considered equivalent to an emission tax, any BTA measure must be consistent with Articles II.2 (a) and III.2 as well as the general principles in Article I and III of the GATT in order to be held WTO compliant. The relevant WTO rules and principles are considered below.

II.2.2 Can BTA be imposed on carbon emissions which are only part of the production process?

GATT Article II.2(a) allows a WTO member, at any time, to impose on the importation of any product a charge equivalent to an internal tax.⁹² Article II allows a charge to be placed on articles "from which the imported product has been manufactured or produced in whole or in part". Article III.2 limits the application of the tax to equivalent charges "applied, directly or indirectly to like domestic products."⁹³

Article II.2(a) permits two types of imported charges: (1) charges imposed on imported *products* that are *like* domestic products; and (2) charges imposed on articles from which the '*imported product has been manufactured or produced on whole on in part*'.⁹⁴

Extensive discussion has taken place on the extent to which the energy inputs and fossil fuels used in the production could be considered '*articles from which the imported product has been manufactured or produced in whole on in part*'. It has been argued that, this requirement excludes the possibility of adjusting taxes on inputs that are no longer present or incorporated in the final product.⁹⁵ Although, the Report of the Working Party

⁹⁰ Pauwelyn, supra note 82 at 26; this would not necessarily be impossible in the context of carbon emissions but may prove to be an additional obstacle

⁹¹ Trade law holds a preference for taxes over other regulations on the ground that taxes are more transparent and efficient than an emission trading scheme for example

⁹² "A charge equivalent to an internal tax imposed consistently with the provisions of paragraph 2 of Article III in respect of the like domestic product or in respect of an article from which the imported product has been manufactured or produced in whole or in part" Art II.2(a); Pauwelyn, supra note 82 at 21; Cendra supra note 50 at 135

⁹³ Article III.2 The products of the territory of any contracting party imported into the territory of any other contracting party shall not be subject, directly or indirectly, to internal taxes or other internal charges of any kind in excess of those applied, directly or indirectly, to like domestic products. Moreover, no contracting party shall otherwise apply internal taxes or other internal charges to imported or domestic products."

⁹⁴ The first type could refer, for instance, to charges imposed on domestic fuels and imported 'like fuels'.

⁹⁵ Article II.2(a) may restrict the application of Article II to inputs physically incorporated into, or part of, the final product. Taxes on fuels themselves may be possible; see de Cendra, supra note 50 at 141; UNEP-WTO report, supra note 11; Pitschas, C., *GATT/WTO Rules on Border Tax Adjustment and the Proposed European Directive Introducing a Tax on Carbon Dioxide Emissions and Energy*, Georgia Journal of International and Comparative Law 24, 493 (1995), Droge, S., Trabold, H., Biermann, F., Bohm, F. and Brohm R, *National Climate Change Policies and WTO law: a case study of Germany's new policies*, World Trade Review 3;2

on Border Tax Adjustments⁹⁶ acknowledged that adjustment was not normally made for energy⁹⁷, it did not provide a clear answer to the eligibility of taxes on carbon emissions for adjustment.⁹⁸ The GATT case law, in particular the *Superfund case* of 1987 is also inconclusive, since it does not specifically address the issue of inputs, which are fully consumed in the production process.⁹⁹

However, it has been recently contended, that since the panel in the *Superfund case* determined that a US tax on certain substances¹⁰⁰ was eligible for border tax adjustment,¹⁰¹ in principle the GATT allows BTA based on the quantity of inputs used and consumed in the production process.¹⁰² Furthermore, the word ‘indirectly’ contained in Article III.2 may be interpreted as allowing the use of border tax adjustments on taxes that are charged on inputs used during the production process of a particular product.¹⁰³ According to this reasoning, a tax on energy or fuels used in the production process or the carbon emitted during production (neither of which are incorporated into the final product) may be applied indirectly to products.¹⁰⁴

Even if the measure is permissible under Article II, or if it is simply not a tax at all, it must, nevertheless, not infringe upon the general National Treatment provisions of Article III and the Most Favoured Nation (*MFN*) clause in Article I.

II.2.3 Article I, III and the issue of likeness

The national treatment principle in Article III is relevant were any climate change regulation is applied differently to domestic and foreign producers.¹⁰⁵ GATT Article I (*MFN*) is also violated where a border measure takes a country based approach to

(2004); see also Biermann and Brohm, suggest that Article II.2a means that taxes can only be levied on intermediate products, which are incorporated into the final product, supra note 89.

⁹⁶ Adopted by the GATT membership on 2 December 1970, L3463 at para 4

⁹⁷ Id. Classified as ‘taxes occultates’ para 15

⁹⁸ Veel, P. E., *Carbon Tariffs and the WTO: An evaluation of Feasible Policies*, Journal of International Economic Law 12(3), 749-800

⁹⁹ Panel Report, United States—Taxes on Petroleum and Certain Imported Substances, L/6175 - 34S/136. (adopted on 17 June 1987) (hereafter *Superfund case*) See Quick, supra note 17;

¹⁰⁰ In *Superfund* the United States imposed a tax on inputs in the production process of certain chemicals (The *Superfund Act* of 1986 aimed at financing domestic programmes to clean up hazardous waste sites); Id.

¹⁰¹ *Superfund*, Id, paras 5.2.4, 5.2.7 and 5.2.10

¹⁰² See Goh, G. The World Trade Organization, Kyoto and Energy Tax Adjustments and the Border, Journal of World Trade 38:3 (2004); Pitschas, supra note 95 at 491 it should be noted, however, that the issue of the chemical inputs were physically incorporated into the final product was not examined by the GATT panel.

¹⁰³ See Demaret, P. and Stewardson, R., *Border Tax Adjustments under GATT and EC Law, and general implications for environmental taxes*, Journal of World Trade Law, 28, 28 (1994); Pauwelyn, supra note 82 at 20; Biermann and Brohm, supra note 89 at 293

¹⁰⁴ See WTO report, supra note 13 at 104

¹⁰⁵ Article III.4 requires that the US accord to importers products ‘treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation and use’. In the climate change context a question arises as to whether the same goods may be viewed differently if one is much more carbon-intensive than the other.

distinguish between *like* products on the basis of national origin. The proposal in Waxman Markey, whether a BTA or not, may violate both of these general principles.

In accordance with these principles, a panel would need to determine whether foreign and domestic good are ‘like’. The issue of ‘like products’ is important because Article III and I require that an imported product be treated no less favorably than like products of national origin (i.e. like domestic products) or like imported products. If two products are considered ‘like’, then they should, as a rule, be treated the same.¹⁰⁶ This is, of course, subject to the exception in Article XX discussed below.

Generally speaking, however, the interpretation of ‘like’ products does not permit differentiation based in the way a product is made (so called process or production methods or *PPMs*). Rather only the products physical characteristics can be used to determine likeness.¹⁰⁷ Therefore, there is a significant unanswered question as to whether products produced using less carbon are unlike products that used more carbon during the production process¹⁰⁸. The rationale behind this argument cites national sovereignty and the inherent right of each nation to create their own regulation for production of goods.¹⁰⁹

The GATT does not define the term ‘like products’ and this determination is left to the Appellate Body on a case-by-case basis. In its first landmark decision addressing trade and environment issues, the Appellate body determined that a state could not discriminate between domestic and imported goods on the basis of PPMs.¹¹⁰ Given that steel created in a climate-friendly way is physically indistinguishable from steel created in a climate-unfriendly way, GATT jurisprudence suggests that a measure that distinguishes ‘like’ products based on how much carbon was emitted in their creation may violate Article I and III.¹¹¹

However, the *Tuna-Dolphin*¹¹² case was not entirely adopted in recent case law. In the *US-Gasoline*¹¹³ and *US- Shrimp*¹¹⁴ cases, the Appellate Body ruled that PPM

¹⁰⁶ If they are ‘unlike’, then they can be subject to different tariffs, taxes or other regulatory measures.

¹⁰⁷ Mitsuo Matsushita, *The World Trade Organization; Law, Practice and Policy* 163 (2003); Robert E. Hudec, *The Product-Process Doctrine in GATT/WTO Jurisprudence in New Directions in International Economic Law: Essays in Honor of John H. Jackson* 189, 191 (Marco Bronckers & Reinhard Quick eds (2000))

¹⁰⁸ For example is steel from China made with coal a like product to domestically produced steel using renewable energy

¹⁰⁹ There are also issues of equity since PPM based measures are most frequently used by rich, importing countries, the products that are denied entrance into important markets are frequently those of developing countries; Climate Measures and Trade at 11

¹¹⁰ Panel Report, United States – Restrictions on Imports of Tuna, DS21/R (Sep. 3. 1991), GATT BISD (39th Supp) at 155 (1993) (hereinafter *Tuna/Dolphin*)

¹¹¹ Bhagwati, J., & Mavroidis, C, P., *Is an action against US exports for failure to sign the Kyoto Protocol WTO-legal?*, World Trade Review 6, 299-310 (2007)

¹¹² *Tuna/Dolphin*, supra note 110

restrictions were not necessarily a violation of the GATT principles.¹¹⁵ The Appellate Body in the EC Asbestos dispute also found that products incorporating chrysotile asbestos fibers were not ‘like’ those made from other materials given the public health risks of asbestos.¹¹⁶ This may suggest that importing products can be distinguished on the basis of environmental externalities.¹¹⁷

Pursuant to WTO jurisprudence, consumer tastes and habits may be used to distinguish products.¹¹⁸ According to Bhagwati and Mavroidis a reasonable consumer test would probably lead to the conclusion that consumers who are aware of the environmental hazard that global warming represents, will treat two goods varying in carbon emissions as ‘unlike’.¹¹⁹ However, this issue is far from settled with other scholars arguing that, the criterion of ‘consumer tastes and habits’ cannot be stretched so far as to render physically identical products unlike.¹²⁰

Furthermore, the Appellate Body in the *EC-Asbestos*¹²¹ dispute did not go as far as to state that physically like products can be considered unlike because of their production methods. In this case, the extent of the ‘competitive relationship’ had relevance to the question of likeness. It would certainly be very difficult for the US to argue that adjustment at the border is required because of competitiveness concerns and then assert that high carbon and low carbon products are unlike and do not compete in the first place.¹²²

¹¹³ Appellate Body Report, United States – Standard for Reformulated and Conventional Gasoline, WT/DS2/AB/R (Adopted 20 May 1996) (hereinafter US-Gasoline)

¹¹⁴ Appellate Body Report, United States- Import Prohibition of Certain Shrimp and Shrimp Products, WT/DS58/AB/R (Adopted 6 November 1998) (hereinafter US-Shrimp)

¹¹⁵ Both cases relied on the Article XX exception; In US-Shrimp a ban on imports to protect sea turtles (harmed through the production of shrimp trawling) was provisionally justified under Article XX(g); In US-Gasoline the measure at issue required the use of clean burner gasoline to reduce harmful vehicle emissions. The specific goal was to improve air quality. This was also provisionally justified under Article XX (g); see supra note 113 and 114. Therefore it appears that the exception in Article XX will be required to demonstrate Waxman-Markey’s WTO compliance.

¹¹⁶ Appellate Body Report on European Communities – Measures Affecting Asbestos and Asbestos-Containing Products WT/DS135/AB/R, (Adopted 12 March 2001) (hereinafter EC-Asbestos) at para 99; Although, the panel did not address the specific question whether these chemicals had to be physically present in the imported product.

¹¹⁷ See Howse and Eliason, supra note 89

¹¹⁸ In Panel Report, Japan- Customs Duties, Taxes and Labeling Practices on Imported Wines and Alcoholic Beverages, L/6216-34S/83 (Adopted 10 November 1987) (hereinafter Japan- Alcoholic Beverages) the Appellate Body outlined four factors that have been considered in GATT and WTO jurisprudence for determining whether two products are a like (1) the product’s end uses; (2) consumers’ tastes and habits; (3) the products properties, nature and quality and (iv) similar tariff classification

¹¹⁹ Bhagwati & Mavroidis; supra note 111; Some scholars argue that physically identical products can be considered unlike due to different production methods, see Howse and Eliason, supra note 89.

¹²⁰ See Wiers, L., *Environmentally Motivated Tax Distinctions and WTO Law: The European Commission’s Tax Paper on IPP in light of the ‘Light Product- and PPM debates*, Journal of International Economic Law (2003), p 419; Quick, supra note 17.

¹²¹ EC- Asbestos, supra note 116

¹²² See Pauwelyn, supra note 82

Finally, there is good reason to believe that the WTO would find the provision a violation of the MFN provision if the measure applied only to certain countries.¹²³ This article would also be violated if a carbon regulation imposed requirements on some developing countries and not others, depending on their stage of economic development.¹²⁴

The precise application of the measure contemplated by s765 of the Waxman Markey Bill may be problematic. The main challenge for legislature is, finding a way to impose equivalent requirements on all producers. The difficulty in assessing product-specific emissions and the fluctuations of the carbon price, make this task almost impossible without causing some discrimination. An additional difficulty may arise in cases where imported products are subject (in their country of origin), to other climate change regulations, such as technical regulations, rather than price mechanisms such as taxes. Compliance with certain regulations, such as fuel efficiency standards, involves costs (e.g. investment in more energy efficient technologies) that may be complex to evaluate and transform into an adjustable price or a 'comparable action'.

The legality of the measure in section 765 would, therefore, depend on whether the measure falls within the exception in Article XX of the GATT.¹²⁵

II.2.4 Article XX Exception will it save the Waxman-Markey?

If the border tax adjustment measure is inconsistent with one of the core provisions of the GATT it may, nevertheless, be justified under Article XX. Article XX of the GATT permits limited conditional departures from the principle of non-discrimination. Two subsections of Article XX are particularly relevant. A WTO member may adopt policy measures that are inconsistent with GATT principles, if the measure is *necessary* to protect human, animal or plant life or health (XX(b)) or if the measure *is related to* the conservation of exhaustible natural resource (XX(g)).

The measure must, in addition, satisfy the requirements of the introductory paragraph of Article XX (the *Chapeau*). The Chapeau requires that the measure is not applied in a manner which, would 'constitute a means of arbitrary or unjustifiable

¹²³ Although this would depend on the actual design of the future scheme, the US would presumably want to discriminate between goods from China and India as opposed to those from Africa

¹²⁴ This principle stands in contrast to Article 3.1 of the UNFCCC of common but differentiated responsibilities.

¹²⁵ See Charnovitz, S., *The Law of Environmental PPMs in the WTO: Debunking the Myth of Illegality*, 27 Yale J Int'L L 59 97 (2002); Hudec, supra note 85

discrimination between countries where the same conditions prevail’ and is not ‘a disguised restriction on international trade.’

In past cases, a number of policies have been found to fall within the expectations of paragraphs (b) and (g) of Article XX.¹²⁶ Although policies aimed at climate change mitigation have not been discussed in the dispute settlement system of the WTO, in the *US-Gasoline*¹²⁷ case, the Appellate Body agreed that a policy reducing air pollution resulting from the consumption of gasoline was a measure concerned with the protection of human, animal and plant life or health. Moreover, the panel found that a policy to reduce the depletion of clean air was within the meaning of Article XX as it aimed to conserve a natural resource.¹²⁸ Therefore policies aimed at protecting human beings and plant and animal species from the harmful effects of climate change would appear provisionally justified under Article XX.

It is important to note that Article XX cannot be invoked to justify a measure to offset competitive disadvantage for domestic industry, as Article XX does not cater for economic arguments¹²⁹ A connection needs to be established between the stated climate change policy and the actual measure at issue.¹³⁰ It is unclear whether a border adjustment as proposed in Waxman Markey, would satisfy the connection test of being *primarily aimed at* (Art XX(b)) or *substantially related* (Art XX(g)) to the goal of reducing carbon emissions, when estimates suggest that the policy will do little to actually reduce carbon leakage and world emissions.

It can be contested, that a tax adjustment measure is more focused on competitiveness than preserving the environment or mitigating against climate change and as such does not fall within the Article XX exception. Rather, the measure attempts to level the competitive playing field and does not necessarily prove effective in reducing carbon leakage or emissions globally.

¹²⁶ Including those aimed at reducing consumption of cigarettes, protecting dolphins, reducing risk to human health posed by asbestos, reducing risk to human, animal and plant life arising from accumulation of waste tyres under (b) – and under (g) policies aimed at the conservation of tuna, salmon and herring, dolphins, petroleum and clean air.

¹²⁷ *US-Gasoline*, supra note 113

¹²⁸ *Id.*

¹²⁹ Weirs, supra note 120

¹³⁰ Article XX GATT, (‘either necessary’ or ‘related to’), supra note 17.

II.2.5 Chapeau

Even if the border adjustment satisfies XX (b) or (g), it must also be justified under the Chapeau of Article XX, designed to prevent measures, which are arbitrary, discriminatory or protectionist. The purpose of the Chapeau is to prevent ‘abuse of the exceptions’ in article XX and ensure that they are exercised in good faith.¹³¹

In the *US-Gasoline*, *US-Shrimp* and in *Brazil-Tyres*¹³², the Appellate Body found the offending measures to be provisionally justified by one of the environmental paragraphs of Article XX but then found the measures violated the Chapeau of Article XX.¹³³

A border adjustment measure may violate the Chapeau depending on how it is designed. First, as discussed above, the measure may do little to actually reduce leakage. Leveling the playing field is not a motivation shielded by Article XX. Furthermore, the Waxman-Markey measure presumably would not differentiate between manufactures from the same country regardless of how much carbon each actually emitted during the production process – such a provision may be ruled arbitrary and discriminatory¹³⁴.

As a practical matter, unjustifiable discrimination will be difficult to avoid since assessing the efficacy of climate change policies in the short-term is a complex task. Nations might argue that a variety of policies should be viewed as comparably effective. Especially since, according to WTO jurisprudence, the US cannot require an exporting country to implement similar market-mechanisms, instead permitting flexibility for nations to pursue other approaches ‘comparable in effectiveness.’¹³⁶

The Appellate Body interpretation of the Chapeau requires that before imposing a border tax adjustment, the US must engage in ‘serious, across the board negotiations’ with

¹³¹ Aimed at protecting interests considered legitimate under Article XX and not as a measure to circumvent one Member’s obligations towards other WTO Members. Appellate Body Report, *Brazil-Measures Affecting Imports of Retreated Tyres WT/DS332/AB/R*, 3 (Adopted December 2007) (hereinafter *Brazil – Tyres AB*) at paras 215

¹³² *Id.*, *US Gasoline* Supra note 113; *US-Shrimp* supra note 114

¹³³ *Id.* The Appellate Body focuses on the ‘cause or rationale for the given discrimination’; *Brazil-Tyres*, para 246

¹³⁴ It would also do little to incentivize manufacturers to reduce their emissions since the requirement to hold allowances will be determined on a country basis. In *US-Shrimp* The Appellate body has interpreted ‘arbitrary or unjustifiable discrimination’ to preclude the measure used; supra note 114

¹³⁶ *US-Shrimp*, *Id.* at para 137-144; There are, however, a number of practical difficulties involved in the implementation of a border tax adjustment in relation to carbon or energy tax and further difficulties in designing a mechanism to adjust the cost of emission allowances and calculate the level of adjustment. The main challenges relate to (1) the difficulty in assessing product-specific emissions and (ii) the fluctuations of the carbon price (emission allowances) in the context of an emission trading scheme. An additional difficulty may arise in cases where imported products are subject in the country of origin, to other climate change regulations, such as technical regulations, rather than price mechanisms such as taxes.¹³⁶ Compliance with certain regulations, such as fuel efficiency standard, may also involve cost (e.g investment in more energy efficient technologies) that may be complex to evaluate and transform into an adjustable price or a ‘comparable action’.

other nations that may be the subject of border tax adjustment.¹³⁷ Therefore, greater emphasis is required on reaching a global solution at Copenhagen – a solution which could actually be undermined by the very BTA and competitiveness provisions proposed.

It appears that the BTA measures proposed by the Waxman-Markey bill are likely to violate WTO rules. Interestingly, a recent study by McKibbin and Wilcoxen found that such measures would reduce leakage and emission reductions very modestly and would do little to protect import-competing industries. The study concluded that benefits produced by BTA ‘would be too small to justify their administrative complexity or their deleterious effects on international trade and the potentially damaging consequences for the robustness of the general trading system’.¹³⁸ The lack of effectiveness as well as the number of possible challenges that such a measure would raise, produces strong reasons for the US to exercise caution in implementing a BTA measure.

Finally, it is of note that the trade provisions of Waxman-Markey Bill are sequentially divided into two time periods. The first, prior to 2020, concerns itself only with domestic businesses and their production. Only after 2020, following a study conducted pursuant to Section 767(b)(1) of the Bill, the Act may be extended to cover products originating in foreign countries. Although, both aspects raise issues of consistency with the WTO, it is unclear whether an action can be brought against the US for a policy measure, which has not yet come into being. Since section 765 (f)(f) will only apply after 2020, a complaint cannot be instituted against a specific measure but against the Act as such¹³⁹. Its potential inconsistency with WTO rules is, however, an important consideration in determining whether to proceed with such a policy.

PART III – Suggestions for alternative action / Recommendations

Given the potential inconsistencies of the Waxman Markey provisions with WTO law and at best, the measures modest effectiveness, the following four recommendations are proposed:

III.1 Strong US legislation and an altered view of competitiveness

If the world is indeed heading towards a carbon-constrained future, more efficient practices will be needed. It has been seen that companies profit from a strong regulatory

¹³⁷ US-Shrimp, supra note 114 at 164

¹³⁸ McKibbin & Wilcoxen, supra note 44

¹³⁹ Mavroidis, supra note 23 at 41

environment at home to build a competitive advantage abroad.¹⁴⁰ Uncertain policy structures may shield energy inefficient industries in the short term, however, in the long term they will simply allow other countries to gain a competitive advantage and build a market for products and services more adapt to a low-carbon future. Such concerns have been recognized by some US companies who have called for strong mandatory climate change policy.¹⁴¹ Therefore, it would be in the interests of industry to abandon arguments in favor of border-tax-adjustment and free allocation in order to develop the required competitive advantage in a carbon constrained economy of the future.

III. 2 Protect employment using overall climate change policy

Another possibility, as suggested by Houser, to guard against declines in output and employment, is to reduce the non-carbon related costs for vulnerable industries¹⁴². Such an approach was adopted as part of the United Kingdom's climate change levy, where the economic impact of the tax is offset by a reduction in the amount employers that are required to pay the National Insurance System.¹⁴³

Under a cap-and-trade scheme in the United States, a carbon price of \$20 per tone of CO₂ would create a \$6.5 billion per year in additional costs for the five carbon-intensive industries. Some of that cost would be mitigated through efficiency improvements or passed on to downstream consumers. In comparison, health insurance alone costs the same five industries roughly 10 billion per year, while retirement expenses account for another \$5 billion.¹⁴⁴

Certainly using profits derived from auctioned allowances can be used to address employment concerns more specifically than free allocation which, does not provide direct incentives to expand or even maintain the workforce numbers. A possible solution to protect employment and industry may be to use the funds raised from auctioned allocation and re-distribute them to industry through lower health insurance or retirement costs for employees.

The government could also invest the money in new 'green' infrastructure projects that could assist EITE's in reducing their energy use and therefore lowering production

¹⁴⁰ Houser, supra 23 note 12 citing past experience in renewable energy

¹⁴¹ US Climate Action Partnership's Call to Action, see at www.us-cap.org

¹⁴² As part of an overall climate change policy, this measure can be kept WTO consistent by giving financial benefits broadly and not limiting access to specific industries. See discussion under subsidies of this paper

¹⁴³ Details on the UK climate change levy are available at the website of HM Revenue & Customs at <http://customs.hmrc.gov.uk>

¹⁴⁴ Department of Labor, Bureau of Labor Statistics, National Compensation Survey and Current Employment Statistics, 2008, Washington, available at www.bls.gov. Healthcare and retirement costs are based on manufacturing sector wide averages.

costs. The projects would have the dual advantage of increasing the competitiveness of certain industries while at the same time providing necessary employment opportunities in key 'green' areas.

III.3. Eco-labeling- an alternative less restrictive trade measure

The use of environmental labeling or eco-labeling schemes as an alternative policy tool to protect the environment and mitigate climate change has gained recent attention.¹⁴⁵ Eco-labeling schemes are arguably less restrictive than the alternative trade measures.¹⁴⁶ Eco-labeling schemes harness the market mechanisms and use market incentives to promote environmentally friendly products. Such schemes have been found effective in reducing energy consumption and encouraging conscious consumerism¹⁴⁷.

One of the main objectives of energy labeling is to encourage manufactures to develop and market the most efficient products, by ensuring that the benefits of such products can be recognized by the customer. Labeling schemes also aim to stimulate market innovation in energy-efficient products by 'transforming the suppliers of such energy-efficient products from 'niche markets' to 'market leaders'.¹⁴⁹ Schemes of this nature may prove more effective than a border tax adjustment measure and raise less WTO legality concerns.

III.4. Reaching global agreement

While the bulk of emissions added to the atmosphere over the past century came from the industrialized world, and the United States in particular, over the next century the majority will come from the developed world. Carbon emissions have the same effect wherever they arise and as such, no country can unilaterally solve the problem. International cooperation is needed. As Pascal Lamy, former Director-General of the WTO aptly put it 'the 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. In other words, until a truly global consensus emerges on how to best tackle the issue of climate change, WTO Members will

¹⁴⁵ Lind, N.S, *Eco-Labels and International Trade Law: Avoiding Trade Violations While Regulating the Environment*, 8 Int'l Legal Presp. 113 1996

¹⁴⁶ Voluntary eco-labeling measures fall outside the scope of the WTO since they tend not to restrict market access.

¹⁴⁷ Daphna Lewinson-Zamie, *Consumer Preferences, Citizen Preferences and the Provision of Public Goods*, 108 Yale L.J 377 (1998)

¹⁴⁹ WTO-UNEP, supra note 11

continue to hold different views on what the multilateral trading system can and must do on this subject. Only a consensual international accord can take them forward.’¹⁵⁰

All countries have a responsibility to address climate change. However, as reflected by UNFCCC principle of common but different responsibilities, countries have not all contributed to the same extent to cause the problem, nor should they all equally be equipped to address it. Achieving international agreement will prove difficult. Especially in the face of considerations of economic efficiency, which requires low costs of abatement in the developing world and distributional equity, which demands action from rich nations historically responsible for emitting greenhouse gasses.

Until a truly international approach is adopted, it is critical that the US show real leadership, adopting serious unilateral measures to curb emissions. Simultaneously, the developed world must take collective steps to assist developing countries to reduce their emissions.¹⁵²

Conclusion

At the United Nations Climate Change conference, held in Copenhagen this December, countries reaffirmed their commitment to action on climate change. A number of obstacles, including the current financial turmoil may stand in the way of a comprehensive international agreement. As stated by Sir Nicholas Stern, in his report, the danger of huge future costs can be reduced by incurring relatively modest costs over the next few decades.¹⁵³ It is, therefore, imperative for the United States, ranked first among large greenhouse gas emitters and accounting for more than twenty percent of total world greenhouse gas emissions, to take action even if it is unilateral and at some expense to its trade exposed industries.

Trade measures proposed in the Waxman-Markey Bill could interrupt the broad agenda of trade liberalization that has proven enormously successful in boosting world economic growth since the Second World War and may hinder international negotiations to design a global climate change accord.¹⁵⁴ It is important to find ways to address concerns about competitiveness and leakage without undue damage to the world trading

¹⁵⁰ Pascal Lamy, Preface, *Carbon and Climate Law Review* (2008) cited in Joost Pauwelyn’s testimony before the subcommittee on Trade of the House Committee on Ways and Means, March 2009 at 5.

¹⁵² Bordoff, *supra* note 2 at 27

¹⁵³ Stern, *supra* note 21.

¹⁵⁴ Hubauer, *supra* note 14 at 13

system. This may be achieved through measures such as eco-labeling or use of government revenue to stimulate the economy and protect employment.

Although, certain policy options, such as free allocation and BTA, may shield some domestic producers, they do so at the expense of taxpayers, consumers and downstream industries that rely on those goods. The expected environmental benefits of border tax adjustment for carbon-intensive goods is likely to be quite small compared to the trade and WTO non-compliance risks they pose. Furthermore, any adverse impacts can be mitigated through the well-targeted use of allowance revenue or other broader employment or infrastructure policy.

Finally, protecting US competitiveness in the long run will require not only a regulatory environment but also significant amount of investment in infrastructure, education and research and development. The economic and fiscal costs of protecting carbon-intensive manufacturing must be measured against these longer-term strategic goals.¹⁵⁵ The administration of such measures and their implementation further postpone the introduction of a cap and trade scheme and a comprehensive climate change mitigation policy in the US. Political realism suggests that some form of trade mechanism will be utilized in any climate change legislation passed by the US. Debate continues as to the WTO legality of the proposed measures. This paper concludes that many of the competitiveness and leakage concerns are overestimated. While free allocation provisions in the Waxman Markey appear to be non specific and this is consistent with the SCM Agreement, the BTA measures proposed in section 765 of the Bill are likely to violate the MFN and National Treatment provisions of the GATT. It is doubtful if such a measure can be justified under the exception in Article XX. Consequently, this paper recommends alternate policy measures to address competitiveness concerns. Amidst all this debate one certainty remains – the costs associated with inaction or delay on this issue, are simply too great.

¹⁵⁵ Houser, *supra* note 23 at 12

Bibliography

- Aman A. C.Jr., (2004) *The Democracy Deficit: Taming Globalization through Law Reform*, *New York University Press*.
- Bartenhagen, E.P., (1997) The intersection of trade and environment: an examination of the impact of the TBT agreement on eco-labeling programs, *17 Va. Env'tl. L.J* 51.
- Beriman, F, and Brohm R., (2005) Implementing the Kyoto Protocol without the USA: The Strategic Role of Energy Tax Adjustments at the Border, *Climate Policy* 4, 289-302.
- Bhagwati, J., & Mavroidis, C, P., (2007) Is an action against US exports for failure to sign the Kyoto Protocol WTO-legal?, *World Trade Review* 6, 299-310.
- Bhagwati, J., Afterword: The Question of Leakage, *96 Am. J. Int'l L*, 126, 132 (2002)
- Bhagwati, J., (1993) Trade and the Environment: The False Conflict, *Trade and the Environment*.
- Bordoff, J., (2009) International Trade Law and the Economics of Climate Policy: Evaluating the Legality and Effectiveness of Proposals to Address Competitiveness and Leakage Concerns, *Climate Change, Trade and Competitiveness: Is a Collision Inevitable?* (forthcoming, draft 2009)
- Charnovitz, S., (2002) The Law of Environmental PPMs in the WTO: Debunking the Myth of Illegality, *27 Yale J Int'l. L.* 59 97
- Climate Measures and Trade; Legal and Economic Aspects of Border Carbon Adjustment, *Kommerskollegium National Board of Trade*, Sweden (2009)
- Cole, M.A. and Elliott, R.J.R, (2003) Do environmental regulations influence trade patterns? Testing old and new trade theories, *The World Economy* 26:8, 1163-1186
- Copeland, R.B, & Taylor, M. S., (2004) Trade Growth and Environment, *42 J Econ. Literature* 7,
- Cosbey, A., and Trasofsky, R., (2007) Climate Change, Competitiveness and Trade, *A Chatham House Report*.
- de Centra, J., (2006) Can Emissions Trading Schemes be Coupled with Border Tax Adjustments? An analysis vis-à-vis WTO Law", *Review of European Community and International Environmental Law* 15:2.
- Demaret, P., (1994) and Stewardson, R., Border Tax Adjustments under GATT and EC Law, and general implications for environmental taxes, *Journal of World Trade Law*, 28,
- Dorge, S., (2004) "National climate change policies and WTO law: a case study of Germany's new policies" *World Trade Review*.
- Droge, S., Trabold, H., Biermann, F., Bohm, F., and Brohm, R., (2004) National Climate Change Policies and WTO law: a case study of Germany's new policies, *World Trade Review* 3;2
- Ederington, J., and Minier, J., (2003) Is environmental policy a secondary trade barrier? An empirical analysis, *Canadian Journal of Economics* 36:1, 137-154
- Fischer, C., and Fox, K. A., (2008) Comparing Policies to Combat Emission Leakage: Border Tax Adjustment versus Rebates, *Discussion Paper, National Board of Trade*;
- Folkes, S, V., (1998) Recent Attribution Research in Consumer Behavior: A review and new direction, *14 J Consumer Res.* 548
- Frankel A. J., (2008) Addressing the Leakage/Competiveness Issues in Climate Change Policy Proposals, *Brookings Trade Forum*
- Freeman, J., (2002) Extending Public Law Norms Through Privatization, *116 Harv. L. Rev.* 1292-93

- Furman, J., Bordoff, J., Desphande, M., Noel, P., (2007) An Economic Strategy to Address Climate Change and Promote Energy Security Hamilton Project Strategy Paper, *The Brookings Institution*.
- Gaines, S., (2001) The WTO's Reading of the GATT Article XX Chapeau: A Disguised Restriction on Environmental Measures, *22 U. Pa. J. Int'l Econ. L.* 739;
- Gains, E, S., (2002) Process and Production Methods: How to Produce Sound Policy for Environment PPM-Based Trade Measures? *27 Colum. J. Envtl. L.* 383, 390
- Ganasci, M. (2008) Border Tax Adjustment and Emission Trading: The Implications of International Trade Law for Policy Design, *Carbon and Climate Law Review*, 1
- Gellar, H., Harrington, P., Rosenfeld A.H., Tanishima, S. and Unander F., (2006) Policies for increasing energy efficiency: Thirty years of experience in OECD Countries, *34, Energy Policy*.
- Goh, G., (2004) The World Trade Organization, Kyoto and Energy Tax Adjustments and the Border, *Journal of World Trade*, 38
- Green, A., (2005) Climate Change, Regulatory Policy and the WTO- How Constraining are Trade Rules, *8, 143 JIEL*
- Halvorseen, M. A., (2008) UNFCCC, the Kyoto Protocol, and the WTO-Brewing Conflicts or Are they Mutually Supportive, *Denver Journal of International Law and Policy* 36, 369-379.
- Harris, M.N. K., and Matyas, L., (2002) Modeling the Impact of Environmental Regulations on Bilateral Trade Flows: OECD, 1990-96, *The World Economy*, 25L3, 387-406
- Hoerner, J.A. and Muller, F., (1996), Carbon taxes for climate protection in a competitive world, *A paper prepared for the Swiss Federal Office for Federal Office for Foreign Economic Affairs by the Environmental Tax Program of the Center for Global Change*, University of Maryland College Park, 47
- Houser, T., Bradley, R., Childs, B., Werksman, J., and Heilmayr, R., (2009) Leveling the Carbon Playing Field, *Peterson Institute for International Economics and the World Resource Institute* (forthcoming) 2009;
- Howse, R., and Eliason, A., (2008) Domestic and International Strategies to Address Climate Change: An Overview of the WTO Legal Issues, International Trade Regulation and the Mitigation of Climate Change, (ed. Tomas Cottner, Sadeq Bigdeli and Olga Nartova) *Cambridge, UK: Cambridge University Press*
- Howse, R., and Regan, R., (2000) The Product/ Process Distinction – An Illusory Basis for Disciplining “Unilateralism” in Trade Policy, *European Journal of International Law*, 11, 249.
- Hufbauer G.C., Charnovitz. S., and Kim, J., (2009), Global Warming and the World Trading System, *Peterson Institute for International Economics*.
- Jackson, J. H., (1992) World Trade Rules and Environmental Policies: Congruence or Conflict, *Trade and the Environment*.
- Jaffee, A.B., Peterson, S.R., Portney, P.R., and Stavins, R.N., (1995) Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?, *Journal of Economic Literature*, 33, 132-163
- Janzen, B.G., (2008) International Trade Law and the Carbon Leakage Problem, Are Unilateral U.S Import Restrictions the Solution? *Sustainable Development Law and Policy*, Winter, 23.
- Khan, M.D., (2003) The Logic of Reciprocity: Trust, Collective Action and Law, *102 Mitch. L. Rev.* 71, 72
- Lind, N.S (1996) Eco-Labels and International Trade Law: Avoiding Trade Violations While Regulating the Environment, *8 Int'l Legal Presp.* 113.

- Lodefalk, M., and Storey, M., (2005) Climate Measures and WTO Rules on Subsidies, *Journal of World Trade* 39:1, 23-34
- Mavroidis, C. P., (2009) Take Waxman–Markey to the WTO Court, (presented paper draft)
- McKibbin, J.W., and Wilcoxon, J.P., (2008) The Economic and Environmental Effects of Border Tax Adjustment for Climate Policy, *Brookings Trade Forum*
- McKibbin, J.W., Ross, T.M., Shackleton, R., and Wilcoxon, J.P., (1999) Emissions Trading, Capital Flows and the Kyoto Protocol, *Brookings Institution, Washington, D.C.*
- Parker, L., (2008) Carbon Leakage and Trade: Issues and Approaches, Congressional Research Service, Report R401000
- Pauwelyn, J., (2007) U.S Federal Climate Change Policy and Competitiveness Concerns: The Limits and Options of International Trade Law 12 (Nicholas Inst. for Environmental Policy Solutions, Duke University, Working Paper No 07-02, available at <http://www.nicholas.duke.edu/institute/internationaltradelaw.pdf>)
- Pitschas, C., (1995) GATT/WTO Rules on Border Tax Adjustment and the Proposed European Directive Introducing a Tax on Carbon Dioxide Emissions and Energy, *Georgia Journal of International and Comparative Law* 24, 493
- Quick, R., (2008) Border Tax Adjustment in the Context of Emission Trading: Climate Protection or ‘Naked’ Protectionism, *Global Trade and Customs Journal*, 3, 5
- Rabin, M., (1995) Moral Preferences, Moral Constraints and Self Serving Biases, 3, Berkeley Department of Economics, Working Paper No 95-241, August 16, available at (<http://emlab.berkeley.edu/users/rabin/Moral.Preferences.pdf>)
- Reinaud, J., (2005) Industrial Competitiveness under the European Union Emissions Trading Scheme, *IEA Information paper*.
- Reinaud, J., (2008) Issues Behind Competitiveness and Carbon Leakages, Focus on Heavy Industry, *IEA Information Paper OECD/IEA*
- Saddler H., Muller, F and Cuevas C., (2006) Competitiveness and Carbon Pricing - Border adjustments for greenhouse policies, *The Australian Institute, Discussion Paper* 86
- Stern, N.,(2006) The Economics of Climate Change: The Stern review, 368 (*Cambridge University Press*)
- Stone, V. W. K., (1999) To the Yukon and Beyond: Local Laborers in a Global Labor Market, 3 *J Small & Emerging Bus. L.* 93, 95
- Trade and Climate Change*, A report by the United Nations Environment Programme and the World Trade Organization, WTO Secretariat, Geneva, Switz., DTI/1188/GE, 2009.
- Veel, P. E., (2009) Carbon Tariffs and the WTO: An evaluation of Feasible Policies, *Journal of International Economic Law* 12(3), 749-800
- Wiers, L., (2003) Environmentally Motivated Tax Distinctions and WTO Law: The European Commissions Tax Paper on IPP in light of the ‘Light Product-and PPM debates, *Journal of International Economic Law*
- Xu, X., (2000) International Trade and Environmental Regulation: time series evidence and cross section tests, *Environmental and Resource Economics*, 17:3, 233-257
- Zhang, X. Z., and Assuncao, L., (2003) Domestic Climate Policies and the WTO, *Blackwell Publishing Ltd.*