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CTEI-2012-7

CTEI Working Papers

International Harmonization of Carbon Pricing: A Proposal for the United States[a]

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EXECUTIVE SUMMARY

To date, the Unites States (U.S.) has not committed to a binding federal or international carbon dioxide ("CO2") reduction agreement – an agreement that would signal a willingness and ability to meet CO2 emission reduction targets. Indeed, if the United States were to adopt carbon pricing legislation, several key questions must first be addressed. This includes the question of how best the U.S. could harmonize or link with other systems when: (1) it is concerned with protecting its trade competitiveness; (2) there is a global fragmented carbon market (carbon tax, cap & trade, and non- regulation); and (3) the U.S. must remain compliant with WTO Law?

In light of these complex issues, this brief investigates how the U.S. can best develop a sound greenhouse gas emission reduction policy that effectively reduces carbon dioxide emissions, preserves domestic competition, and is WTO-compliant. In particular, this memorandum proposes the utilization of U.S. border measures. The objective being to have imports bare the same social cost of carbon as domestic firms. This can be done by leveling costs upwards for certain imports and downwards for certain exports as a tool for compensating domestic producers in the applicable sectors.[2] As will be described, this can be linked with other regimes in what is likely a WTO compliant fashion.

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[2] Here, there is a distinction between Border Measures (BMs) and Border Carbon Adjustment (BCAs) measures. With regard to BMs, the WTO-UNEP Report on Trade and Climate Change (2009) defines it as all trade measures imposed at the border by the carbon regulating. This includes BCAs measures, but also other types of BMs such as: import bans, punitive tariff, or imposition of countervailing duties on imports. More limited in scope, BCAs only refers to either (i) border tax adjustments to carbon tax (e.g. carbon tariff on imports) or (ii) border adjustment in relation to a cap-and-trade system (e.g. requirement to buy emissions allowances). Thus the word "adjustment" is associated with price and implies that

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Although there is still some debate, it is becoming well established that greenhouse gas ("GHG") emissions cause climate change.[3] Among the gases, carbon dioxide emissions likely have the largest effect on this atmospheric change.[4] Therefore, mitigating the impact of global warming necessitates effective measures to reduce CO2 emissions. Many economists and politicians agree that the best solution is a market-based measure, such as carbon pricing.[5]

Carbon pricing literally means putting a price on carbon emissions during the production or consumption of a product or service.[6] Through effective pricing,[7]

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the carbon regulating country can "level the playing field" by mirroring the carbon price directly imposed on domestic products to imported products. Although our proposal for the U.S. mainly comprises of BCAs (see Section IV. Specificities of this Proposal below), this memorandum also discusses other types of BMs before coming to the conclusion that BCAs will work best under both US future carbon tax or cap-and-trade system.
See also: Sofia Persson, "Practical Aspects of Border Carbon Adjustment Measures - Using a Trade Faciliation Perspective to Assess Trade Costs," Issue Paper, No. 13, Global Platform on Climate Change, Trade and Sustainable Energy, ICTSD (2010), available at: http://ictsd.org/downloads/2012/03/persson-ictsd-practical-aspects-of-border-carbon-adjustment-measures.pdf [Sofia Persson] ("At the moment, the US seems to be the country that is most seriously considering a BCA as an option.").

[3] See NASA website on Global Climate Change, available at: http://climate.nasa.gov/causes/ ("Most climate scientists agree the main cause of the current global warming trend is human expansion of the "greenhouse effect"--warming that results when the atmosphere traps heat radiating from Earth toward space.)

[4] Id. ("Humans have increased atmospheric CO2 concentration by a third since the Industrial Revolution began. This is the most important long-lived "forcing" of climate change."); see also W.D. Nordhaus, "Economic Issues in a [sic] Designing A Global Agreement on Global Warming," (Copenhagen, Denmark, 2009) ("This analysis focuses on carbon dioxide (CO2) as the most important greenhouse gas (GHG)").

[5] Id. at 1, (Arguing that "a harmonized international carbon tax is likely to be a more effective mechanism for responding to the threat of climate change [than a cap-and-trade approach]," and "[a]ddressing global warming involves not only understanding the science of climate change but also designing effective economic instruments to provide appropriate incentives for nations to join agreement and for market participants.").

[6] See Joost Pauwelyn, "Carbon Leakage Measures and Border Tax Adjustments under WTO Law", in *Research Handbook on Environment, Health and the WTO (forthcoming)*, ed. Geert van Calster and Denise Prévost (Edward Elgar, UK, 2012) – a working paper updating Joost Pauwelyn's *U.S. Federal Comate Policy and Competitiveness Concerns: The Limits and Options of International Trade Law*

this market-based approach seeks to discourage the use of carbon-based products while incentivizing the shift to a low-carbon economy.[8] This theory and approach is endorsed by many nations. The European Union ("EU") and Australia have a cap-and-trade and carbon tax system, respectively.[9] California implements a regional cap-and-trade program.[10] Meanwhile, there are nations with carbon non price-based measures that are separate and apart from a carbon-pricing scheme, such as in India, China and Brazil. Then, there are countries with no national carbon pricing measures such as the United States. At least for the United States, developing a policy requires considering a range of issues that include the: i) purely environmental (how effective can a policy be when there is insufficient global climate change participation), ii) technology (is the technology and innovation strong enough to shift to a green-based economy), and iii) economics (would a policy result in a loss of competitiveness).[11] It appears that Congress is especially focusing on the purely economical concern. In turn, the U.S. should consider implementing a domestic climate policy that alleviates this competitiveness concern. "Such competitiveness provisions would essentially aim at leveling the

(Durham: Nicholas Institute for Environmental Policy Solutions, Duke University, 2007).

[7] For an in-depth analysis of the carbon prices calculation see Frank Ackerman, "Carbon Markets and Beyond: The Limited Role of Prices and Taxes in Climate and Development Policy," G-24 Discussion Paper No. 53 (December 2008) ("If the only tool you have is market liberalization, then every problem looks like a question of getting the prices right. But setting a price for carbon emissions is only the beginning of climate policy, not the end.")

[8] See Joost Pauwelyn, supranote 6.

[9] Under a cap-and trade system, a central authority (usually a governmental body) sets a limit or cap on the amount of a pollutant that may be emitted. The limit or cap is allocated or sold to firms in the form of emissions permits. Those credits represent the right to emit or discharge a specific volume of the specified pollutant. The idea being that the total number of permits cannot exceed the cap, limiting total emissions to that level. Firms that need to increase their emission permits must buy permits from those who require fewer permits. The transfer of permits is referred to as a trade. Failure to reduce emissions is often punishable by a further government regulatory mechanism, such as a fine that increases costs of production. Meanwhile, under a carbon tax system, often it is government regulators that charge a tax depending on the carbon content of fuels.

[10] See California Air Resources Board website: http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm

[11] See Andrew Shoyer, "Proposed U.S. Legislation and Carbon Leakage," (September 2009), available at: http://www.iea.org/work/2009/ghget/Shoyer.pdf

playing field by imposing the same or similar costs on imports, as domestic climate policy imposes on domestic production."[12] This turns on three overarching concerns that will be discussed below: Carbon Leakage, Trade Relations, and Linkage. Approaches that combat all three concerns must remain compliant with WTO law and in particular, the General Agreement on Tariffs & Trade ("GATT"). Especially on point here is the environmental exception provided by GATT Article XX(g) read together with the Chapeau of Article XX, which permits the carbon regulating countries to derogate from its obligation to accord Most-Favoured-Nation Treatment (GATT Article I) and National Treatment (GATT Article III) to products imported from other WTO Members if it satisfies the conditions provided therein.

- **Carbon Leakage**

If the U.S. implements a carbon regime before its trade competitors, it could potentially diminish the production of domestic carbon-intensive products while increasing the competition of countries that do not bear the cost of limitations on CO2 or other GHG emission reductions. If domestic firms lose their competitive edge, the result may be "carbon leakage," meaning domestic manufacturers will simply move their businesses to nations with less stringent carbon policies.[13] In other words, carbon-intensive industries could circumvent the carbon controls and delay green technology improvement by replacing domestic production with imports or shifting their productions and investments to countries with zero or less stringent carbon controls.[14]

Bearing this in mind, the U.S. is particularly keen on having a "carbon equalization system" before any carbon pricing legislation can be put in place.[15] A carbon cost equalization system serves at least three goals: "first, preventing distortion from carbon-intensive imports and preventing domestic production to

[12] Joost Pauwelyn, supranote 6.
[13] See Joost Pauwelyn, supranote 6.
[14] Stéphanie Monjon and Philippe Quirion, "How to design a border adjustment for the European Union Emissions Trading System," *Energy Policy*, 2010. [Monjon and Quirion]
[15] See Susanne Droge, "Tackling Leakage in a World of Unequal Carbon Prices," Climate Strategies, 2008, [Susanne Droge] at 9.

move to uncapped regions; second, keeping up the carbon price signal in a consistent and predicable manner; third, taking account of the international progress under the UNFCCC and under parallel processes (G8 or Major Emitters Forum), which contribute to leveling the carbon pricing field."[16] As previously discussed by Joost Pauwelyn, carbon cost equalization can be executed with competitiveness provisions that "essentially aim at leveling the playing field by imposing the same or similar costs on *imports*, as domestic climate policy imposes on *domestic* production. To level the playing field on world markets, *exports* could also be exempted from domestic climate restrictions."[17]

- **Trade Relations**

In addition to carbon leakage, there are concerns that a carbon equalization system incorporating an anti-competitive trade provision could potentially lead to tumultuous trade relationships. For instance, on June 24, 2009, the *New York Times* reported that the-then circulating greenhouse gas bill with its provisions to levy tariffs on Chinese imports due to carbon emissions, could provoke a trade war.[18] The article highlights United States' double bind. One government alone cannot resolve the negative effects CO2 has on our planet – international cooperation is needed.[19] "Where such cooperation fails or is insufficient, as remains the case today especially after Copenhagen Summit, a government can either resign itself to the problem or do something about it without the support of others."[20] Should the U.S. adopt legislation, there will still be free riders – countries that do not attempt cutting their carbon emissions.[21] On the other hand, if the United States adopts legislation and then seeks to level the playing field with those alleged free riders, it could potentially provoke trade retaliations and break down global climate change negotiations. This is especially the case when foreign countries suspect the

[16] Id.
[17] Joost Pauwelyn, supranote 6 (also discussing four non-economic, and purely environmental reasons, for competitiveness provisions).
[18] "Possible Plan for Tariffs on Imports From China Remains Alive in House Climate Bill," *The New York Times*, June 2009, *The New York Times*, June 24, 2009.
[19] Id. at 3.
[20] Id. at 3-4.
[21] *The Global Climate Change Regime*, Issue Brief (Council on Foreign Relations, 2012).

competition provisions are intended to penalize developing countries without the resources and capacity to meet comparable carbon reductions as the U.S.

- **Linkage**

In addition and related to concerns surrounding carbon leakage and trade relations, is the challenge of linkage. Indeed, "[c]arbon differentials will remain a challenge for international business for mid- to long-term because of the slow process of establishing national emissions trading or carbon tax systems, and the difficulties of linking them."[22] This notion of "linking," should not be confused with harmonization. Harmonization suggests States, in their own jurisdictions enact the same or very similar measures. For example, the US and EU could be harmonized in that both price carbon at similar levels. Although in theory, harmonization is a potential possibility, it is unlikely to happen in the near future as seen by the globally fragmented carbon reduction policies and continuing climate change negotiation breakdowns. Unlike harmonization, the goal of the linkage scheme is in a sense to "level the playing field" between one country with a carbon-policy with other nations that do or do not utilize some type of carbon reduction policy. Therefore, if one ton of carbon costs, say, $30 in the US, linkage realizes and accepts different cost levels but seeks a way to link up these different systems, by for example, making sure that all or certain carbon products consumed in US pay $30., even if they come from abroad (with possible lower prices for poor country imports).

This can be done several ways such as: by agreement between two or more states; by one country unilaterally adjusting carbon price on imports; or accepting variable levels of effort depending on e.g. level of development. This means addressing the competitive imbalance in the costs of producing or manufacturing carbon-intensive products resulting from the difference between:

> (a) direct and indirect costs of complying with a federal carbon pricing legislation, and
>
> (b) the direct and indirect costs of complying with other greenhouse gas regulatory requirements, such as: export tariffs, or other measures adopted or imposed that are related to the reduction of greenhouse gas emissions.

[22] Susanne Droge, supranote 15, at 6.

Such "linkage" must also remain WTO-compliant.[23]

- **Roadmap**

In light of the above, crafting a domestic climate policy with provisions to alleviate competition concerns, link with other world markets, and remain WTO compliant is the subject addressed by this memorandum. This is done in four parts as follows:

First, the paper reviews how past U.S. bills have sought to address the topic of this memorandum.

Second, the paper expands the scope beyond the U.S. and investigates how competition and linkage are, or are not, addressed under other notable carbon limitation systems. In particular, the memorandum reviews: (a) the European Union that fosters a cap-and-trade mechanism; (b) Australia which currently utilizes a carbon tax regime; (c) California's regional cap-and-trade program; (d) EU and California standard-based regulations with respect to biofuels; (e) other nations with carbon reduction policies other than carbon pricing, such as, China, India and Brazil; and (f) nations with no carbon reduction regimes.

Third, in light of the analysis above, this memorandum assesses those varying competition and linkage provisions. Additionally, it suggests other possible linkage mechanisms through border adjustment measures (unilateral linkage) or by increasing the carbon market pool (consensual linkage).

Fourth, after reviewing the range of possible linkage policies, this memorandum proposes how the United States can most effectively regulate carbon emissions through a pricing mechanism and still have it link it with other systems in a manner that preserves U.S. competition levels and would most likely be / stands a high chance of being WTO-compliant. How the policy can be implemented and its anticipated efficacy and non-legal challenges are also discussed.

I. Learning From the Past: Failed Federal Carbon Equalization

[23] There are additional international agreements that national measures must be compliant with, such as the United Nations Framework Convention on Climate Change. This memorandum only discusses the compliance with WTO law.

To better understand how to best address ways of leveling the competition playing field under a carbon reduction scheme, it is instructive to review forms of past measures have already been considered in the United States. More recently, the proposals intended to deal with these concerns include allocation of emission allowances free of charge in emission trading schemes,[24] or border measures. Borders measures are trade measures imposed unilaterally at the border of a country or a custom territory (for convenience, hereinafter also referred to as a "country") in order to offset the competitiveness disadvantage of local firms resulting from the implementation of a carbon pricing mechanism by that country. Questions of what to do with goods at the border becomes highly technical, but often comes down to addressing four key questions, as sketched out below:[25] (1) Triggering the Border Measure Provision; (2) Targeted Products and Industries; (3) Calculating the Carbon Footprint and; (4) Applicable Parties. In fact, some of these issues were previously looked at in connection with the 2007-08 Lieberman-Warner Bill; the 2009, Representatives Waxman and Markey 2009 proposed bill for climate change legislation entitled the American Clean Energy and Security Act of 2009 (the "Waxman-Markey draft"); and Senator Boxer and other committee members' February 3, 2009 six basic principles for legislation on global warming.

A. Triggering the Border Measure Provision

The US could try negotiating a global climate policy (as it arguably already did in the UNFCC context), and if that fails, then enact a national climate bill which immediately implements Border Measures; meaning there would be no lag period before imposing cost on domestic products and imports. Alternatively, it could enact carbon legislation that provides a certain period for negotiations with other countries before implementing Border Measures. This period of negotiations can be seen as a grace period, and the potential failure of said negotiations can be the

[24] Such free allowances undermine the environmental effectiveness of the policy, and therefore are not recommended in this paper.

[25] While this section only sketches out the relevant debates, Section III Merging the Different Carbon Reduction Regimes, discusses possible solutions, and in Section IV A Proposal for the United States, we set forward a proposal that we believe best addresses how the United States can most effectively regulate carbon emissions through a pricing mechanism and still have it link it with other systems in a manner that preserves U.S. competition levels and is WTO-compliant.

means for triggering a competition provision. In both cases, a negotiations period is necessary for the purpose of WTO compliance. It demonstrates that the Border Measures, although potentially contrary to the US's obligations under WTO law, could be justified under the environmental exception of GATT Art. XX(g). In particular, such negotiation period would likely meet one of the conditions under the Chapeau of GATT Art. XX, which requires the implementing country to negotiate with other countries in good-faith before resorting to any unilateral measure, although a concrete result does not have to be achieved.[26] As stated by Joost Pauwelyn in his analysis of the said condition:

> Before imposing the 'unilateral' carbon tax or regulation on imports, did the carbon-restricting country engage in 'serious, across-the-board negotiations with the objective of *concluding bilateral or multilateral agreements' to address climate change?*[27] This does not require the actual conclusion of agreements with, say, China, Brazil or India[28], but at the very least good faith efforts by the carbon-restricting country to bring these countries into the fold of an international effort to combat climate change before making a move to the second or third best option of unilateral border adjustments. Such negotiations must also occur on a non-discriminatory basis with all countries affected.[29]

From a policy perspective, a grace period prior to implementation is desirable because it would grant developing countries "reasonable time to develop and operate national climate policies and measures."[30] This was something considered and acknowledged in the proposed 2009 Waxman-Markey Bill. There, the Bill would have established two mechanisms to safeguard the competitiveness of greenhouse gas emissions-intensive U.S. manufacturing industries. First, it would allocate some emissions allowances to greenhouse gas emissions-intensive

[26] Joost Pauwelyn, supranote 6.
[27]United States - Import Prohibition of Certain Shrimp and Shrimp Products, WT/DS58/AB/R (Appellate Body Report), para. 166.
[28] United States - Import Prohibition of Certain Shrimp and Shrimp Product (Implementation under Article 21.5), WT/DS58/RW (Panel Report), para. 124.
[29] Joost Pauwelyn, note 6 above.
[30] Z. Zhang, "Multilateral trade measures in a post-2012 climate change regime? What can be taken from the Montreal Protocal and the WTO?," *Energy Policy*, 2009: 5105-5112.

and trade-exposed domestic manufacturing industries at no cost.[31] Then, there was a fall-back mechanism that could restrict imports in the event the free allowance mechanism was not adequately safeguarding domestic manufacturing industries from carbon leakage.[32] In particular, the provisions call for the establishment, after 2017, of an "International Reserve Allowance Program" pursuant to which importers of covered goods would be required to surrender, upon importation, international reserve allowances in an amount covering the greenhouse gas emissions associated with the manufacture of the imported goods. International reserve allowances would be drawn from an independent allowance pool and could not be used by domestic entities to comply with their domestic cap-and-trade obligations.[33] This approach was remarkably different from Senator Boxer's Amendment that proposed a border adjustment become effective beginning in 2019.[34]

Indeed, WTO law under the Chapeau of GATT Article XX compels the U.S. to consider the questions related to the negotiation and grace period, which includes:

- Does the implementation and administration of the climate legislation respect basic fairness and due process?
- If there would, for example, be certification or rebates for domestic efforts to fight climate change or developing countries?
- Is the process transparent and predictable?
- Are parties heard and is the system non-discriminatory in its procedures?[35]

B. Targeted Products and Industries

In order to effectively address carbon leakage concerns and maintain the environmental integrity of an emission trading system, a carbon reduction policy

[31], Title IV, Section 721 (f) (2)of the Waxmann-Markey American Clean Energy and Security Act of 2009, H.R. 2998, 111 Congress. Text as of Jun 23, 2009. [ACESA of 2009]
[32] Monjon and Quirion, supranote 14.
[33] Title IV, Sections 724-728 of the ACESA of 2009.
[34] Section 6006 of the Boxer's Substitute Amendement to the Lieberman-Warner Climate Security Act of 2008 (S. 3036),110th Congress.
[35] Joost Pauwelyn, supranote 6.

will need to specify which industry sectors fall under its terms and how the provisions will be applied. This can have a profound effect on competition and linkage. Essentially, the covered products could range from a limited list of products such as steel, aluminum, cement, to a maximalist approach, which includes many products including downstream products. Indeed, "[h]ow to treat downstream products is one issue facing a country considering imposing a BCA. Imposing a carbon tariff or requirement of emissions allowances on greenhouse gas intensive basic products but not on downstream products could lead to a change in trade patterns and carbon leakage. For instance if a BCA on steel in the EU, but not on cars, causes firms to move the production of cars outside the EU to avoid the BCA costs and then import the products instead."[36]

Among the other considerations to bear in mind when determining the products covered under a carbon reduction policy is a sector's ability to pass through the cost of carbon. This depends on a few characteristics, such as "direct and indirect costs, impacts on operational costs, capacity utilization or vertical integration."[37] The EU has already reviewed and come to a relatively large consensus on which industries are most susceptible to carbon leakage using the following criteria: (i) face high cost impacts due to direct CO2 emissions (combustion and process) and/or indirect emissions from electricity and (ii) are very exposed to international competition.[38] Indeed the risk of significant carbon leakage exists only in these sectors. Using that criteria, the EU ETS published a list of 164 exposed sectors, which was later expanded.[39] Meanwhile, according to other reports, limiting the sectors to steel, cement, and aluminum, and some chemicals is likely enough to tackle the bulk of carbon leakage.[40]

Another important factor to take account of is the administrative burden that follows the covered products. The more products subjected to a border measure, the higher the administrative burden will be for agencies responsible for

[36] Monjon and Quirion, supranote 14.
[37] Susanne Droge, supranote 15.
[38] Article 10a of the revised EU ETS Directive 2009/29/EC.
[39] Id.
[40] Monjon and Quirion, supranote 14.

implementing and supervising the measure.[41] Therefore, on one hand, the inclusion of high-carbon finished products would contribute to better achieving the environmental goal of reducing carbon emissions and preventing carbon leakage. On the other hand, retracing carbon footprint in finished goods is highly challenging, especially when inputs might come from different countries of origin using different technologies. Furthermore, the origin of the components might be easily obscured by using importing-reexporting schemes.[42] Notably, unlike Senator Boxer's Amendment, both the Lieberman-Warner Bill of 2008 and the Waxman-Markey Bill of 2009 exclude finished products from covered border measures.[43]

C. Calculating the Carbon Footprint

Challenges also arise in the context of defining the rules on how the greenhouse gas emissions for a product should be calculated. The number depends largely on the production methods used because it is not possible to assess the level of greenhouse gas emissions emitted during the production of a product by merely inspecting the product at the border.[44] Further, while the calculation is certainly necessary for imports, it is not unlikely to be needed for exports as well -- there is the possibility of carbon costs for exports of domestic greenhouse gas intensive

[41] See Peter R. Orszag, "Issues in Designing a Cap-and-Trade Program for Carbon Dioxide Emission," in *Testimony before the Ways and Means Committee, US House of Representatives* (18 September 2008).
[42] Id.
[43] See Sofia Persson, supranote 2. ("If the implementing country opts for the solution with standardized charges, the government would need to define benchmarks for all products covered by the scheme, possibly on a country level. To set these benchmarks, the implementing country would need to gather large amounts of information on greenhouse gas emissions and production methods from domestic and/or foreign producers. The implementing country must also put in place a system for controls at the border. Costs for border authorities are driven up under a [border carbon adjustment ("BCA")] for several reasons, such as if manual intervention is required to clear consignments at the border crossing, electronic submissions are not possible, large resources have to be devoted to prevent evasions, the BCA covers a large range of products, and if many companies are given individual treatment. Costs may also be driven up if the BCA results in a need for major IT development to deal with new processes. For the exporting country's authorities there can also be costs from a BCA. For instance, if an exporting country needs to put in place a scheme for rebates on exports or if the country's agency is responsible for the accreditation of the carbon footprint calculation, the result would be increased costs for border authorities.")
[44] Sofia Persson, supranote 2.

goods being reimbursed for their costs. Some possible options for calculating the carbon footprint includes:

- Adjusting the charges according to the level of CO2 emitted during the production of each specific imported product. (E.g. an imported car must pay $50 because its production emitted 1.5 ton of CO2. Calculation of carbon footprint is made by the importer and must be checked by authorized party).

- An adjustment base that sets a standardized tariff or a number of emission allowances required for each product category to be paid when importing the product, regardless of how "green" its production process has been. The standardized charge could either be based on the carbon content of domestic production or based on an average carbon content. (E.g. all imported cars must pay a standardized charge of $50.00).

- Another option is to set a standardized tariff, or emissions allowance purchase for each product, but also to allow for producers in exporting countries that prove to be more efficient than benchmark levels to bear a lower cost.[45]

The list of options is not exhaustive because in fact there is a range of considerations when determining the amount of emissions imputed to both imported and exported products. It is particularly difficult for imports because many nations "have no obligation to declare – and thus do not know precisely – their CO2 emissions."[46] Further, for a small importer, the administrative burden could be high in proportion for its sales. Additionally, "using the average emission per ton in the exporting country for every product covered by the border adjustment could be difficult to compute, especially if the country is reluctant to participate."[47] An alternative is to use the average emissions per ton in the exporting country – a value that could be difficult to compute, particularly when the exporting country does not want to participate.[48]

Taking account of indirect emission is another key element to consider when developing a carbon reduction policy that seeks to alleviate competition concerns through linkage mechanisms. This is because electricity is an input factor for many products. By increasing electricity prices under a GHG bill, electricity-intensive

[45] Id.
[46] Monjon and Quirion, supranote 14.
[47] Z. Zhang, supranote 30.
[48] Id.

sectors are exposed to international competition. However, "'in integrated electricity systems it is technically impossible to identify the origin of an electric energy delivery . . . .'" An accurate calculation of said indirect emissions presents a fundamental question of whether the resulting effectiveness is worth the related administrative costs.

D. Applicable Parties

Last, WTO law and international policy compels the U.S. to question which parties will be subjected to the border measure. In particular, the US must take into account its obligations to accord Most-Favoured-Nation treatment to all 'like products'[49] imported from other WTO Members (GATT Art. I). Two important issues here are:

First, if the US accords equal treatment to high-carbon imports from China, for example, and low-carbon imports from the EU, it would likely create a *de facto* discrimination against imports from the EU because low-carbon imports would usually bear higher production cost. This situation, in turn, would be inconsistent with GATT I because within WTO context, the concept of 'likeness' also extends to 'directly competitive or substitutable products'. Additionally, such equal treatment is not environmentally effective because it does not constitute a 'stick' for countries with lower carbon standards to improve their climate policy.

Second, the environmental dimension of the US climate policy would compel it to only target countries with high emissions but have limited carbon reduction policy in place. Also, special considerations for low and middle-income countries must be taken, as those nations may not be able to effectively reduce carbon emissions without financial and technological transfer mechanisms.[50] On the other hand, less wealthy nations have recognized that industrial countries cannot bear all the incremental costs of climate mitigation and adaptation and they cannot expect all cost to be borne by industrial nations.[51] An eventual discrimination among like imported products based either on the carbon emissions of the exporting countries or their economic capability would certainly constitute a violation of GATT Article I.

[49] The question of "likeness" among products will be discussed at pages 47-48 of this memorandum.
[50] Z. Zhang, supranote 30.
[51] Id.

Such discrimination would likely be justifiable by the environmental exception under GATT Article XX(g). However, the US must also satisfy the conditions imposed by the Chapeau of GATT Article XX, which requires the domestic climate legislation takes account of local conditions in foreign countries. [52] As stated by Joost Pauwelyn:

> [I]t may force the carbon-restricting country to consider whether a foreign country already imposes emissions cuts or otherwise addresses climate change. […]
> [T]he requirement to take 'into consideration different conditions which may occur' in different foreign countries, may force the carbon-restricting country to consider whether developing countries should, for historical reasons, carry the same burden as other countries. Under the UN Framework Convention on Climate Change (ratified by the United States), for example, protection of the climate system must be pursued 'on the basis of equity and in accordance with [the parties'] common but differentiated responsibilities and respective capabilities'. This, in turn, may oblige (or at least enable) the carbon-restricting country to impose a graduated import tax or regulation depending on the stage of economic development of the foreign country in question.

Indeed, the failed Lieberman-Warner Bill proposed that border measures imposed under the "International Reserve Allowances Program,"[53] exclude certain countries from the compliance list. Those countries were:

- countries that have taken action comparable to that taken by the United States to limit the greenhouse gas emissions of the foreign country;
- countries whose respective share of total global greenhouse gas emissions is below the de minimis percentage of 0.5%; and
- least-developed countries according to the classification of the United Nations.[54]

As part of the implementing mechanisms, the Bill would have given the US President wide discretion to establish an interagency to determine whether a "comparable action" has been taken by a foreign country. Such "comparable action" refers to "any greenhouse gas regulatory programs, requirements, and other measures adopted by a foreign country that, in combination, are comparable in effect to actions carried out by the United States to limit greenhouse gas

[52] See Joost Pauwelyn, supranote 6, at 49.
[53] Section 6006 (c) of the "Boxer's Substitute Amendement to the Lieberman-Warner Climate Security Act of 2008 (S. 3036)," *110th Congress*. [CSA 2008]
[54] Section 6006 (c) (4) of the CSA 2008

emissions".[55] In determining "comparable action," the President would take into consideration the level of economic development of the foreign country and its baseline emissions levels, i.e. the total average annual GHGs emissions attributed to a category of targeted goods of a foreign country during the 2012-2014 period.[56] With this in mind, it appears that any proper U.S. policy must determine criteria for which nations will be subjected to the border measure.

Arguably, a provision that ignores these delicate considerations is simply bad policy – it puts less wealthy nations at an even greater trade disadvantage, does not set realistic goals, and does nothing to encourage climate negotiations. However, this becomes a particularly sensitive topic when it comes to developing countries with large developing economies, such as China, which the U.S. would unlikely want to provide special considerations for. [57]

In sum, developing a carbon reduction policy with provisions addressing competition (and hence some of the element this paper just walked through), is not a concern unique to the U.S. Other nations have also addressed these questions. Yet, no country has implemented a substantive and comprehensive carbon equalization system. Below is a discussion on how other major international trade players approach competition concerns under a carbon reduction regime. The discussion is designed to consider the range of competition measures, or lack therefore, that are being utilized by other major trading partners.

II. International Carbon Reduction Policies

In addition to the proposal made in past U.S. bills, competition and linkage concerns have already been addressed under other notable carbon limitation systems. Below is a discussion of those regimes, which include: (a) the European Union that fosters a cap-and-trade mechanism; (b) Australia which currently utilizes a carbon tax regime; (c) California regional cap-and-trade program; (d) California's and EU's standard-based regulations with respect to biofuels; (e) other

[55] Section 6001 (2) of the CSA 2008
[56] Sections 6001 (1) and 6005 (a) of the CSA 2008
[57] Committee on Energy and Commerce, 2008. "Climate Change Legislation Design-Competitiveness Concerns/Engaging Developing Countries". White Paper, available at: http://energycommerce.house.gov/Climate_Change/index.shtml (stating that "China and the other emerging economies are the source of much of the concern in the US climate policy debate.")

nations with carbon reduction policies other carbon pricing, such as, China, India and Brazil; and (f) nations with no carbon reduction regimes.

A. Policies using Carbon Pricing

Currently nations or regions that implement carbon emission reduction policies by market based approaches do so primarily through either cap-and-trade or carbon tax. As discussed below, the features of the EU cap-and-trade system and the Australian carbon tax system exemplify how carbon pricing mechanisms attempt to address carbon leakage and competitiveness concerns. However, the respective mechanism's competition provisions that are discussed below do not address border adjustments for imports in their attempts at addressing carbon leakage concerns. For the purpose of this paper, therefore, they cannot be said to have comprehensive competition provision.

a) EU Emission Trading Scheme (cap-and-trade)

The EU Emission Trading Scheme ("EU ETS") was launched in 2005 and improved by the ambitious "Climate and Energy Package" adopted by the EU in 2009[58] to implement its 20-20-20 targets by 2020.[59] Based on a cap and trade principle, it sets a maximum quantity on annual carbon dioxide (CO_2) emission from major industrial sources that purchases or receives a quantity of "allowances" or permits to emit one metric ton of CO_2. The system now operates in 30 countries (the 27 EU Member States plus Iceland, Liechtenstein and Norway).[60] At present, the EU ETS covers about half of the EU's CO_2 emissions.

Currently the approach of the EU ETS to trade competitiveness is mainly in the form of free allowances allocation to the "sectors or subsectors that are exposed to a significant risk of carbon leakage" determined by the basis of direct and indirect additional costs induced by the implementation of the Directive

[58] See Table 1: Current Carbon Policies in Top 25 GHGs Emitting Countries for the list of core legislations in the package.

[59] The 20-20-20 targets are: (i) a reduction in EU GHGs emissions of at least 20% below 1990 levels; (ii) 20% of EU energy consumption to come from renewable resources; and (iii) a 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

[60] "Iceland, Norway, Liechtenstein to join EU emissions trading system 2007", *AFP*, October 2007.
Available at: http://www.eubusiness.com/topics/environ/1193418125.05

2009/29/EC (amending Directive 2003/87/EC and extending the EU emission allowances trading scheme).[61] Installations within these covered sectors or sub-sectors receive free allocation of allowances up to 100% of the relevant benchmark until 2020. This provision indicates that 164 out of 258 sectors (at NACE-4 level[62]) meet the criteria and the sectors at the risk of carbon leakage make up 75% of the whole, according to the analysis done by SFS Economics.[63] Regarding export goods, the ETS allows 73% of merchandise exports from the EU up to 100% free permits for their emission. Further, 48% of its manufacturing sector value added will be covered by the ETS provision concerning carbon leakage.[64] All together, the sectors responsible for approximately 8% of EU member states' GDP are protected by potential competitiveness loss.[65]

Such provisions however currently do not include comprehensive border adjustment for imports. Directive 2009/29/EC revised the EU ETS and included some Competitiveness provision addressing carbon leakage concerns. The Directive suggests, although very cautiously, a border adjustment for GHG-intensive imports:

> By 30 June 2010, the Commission shall [...] submit to the European Parliament and to the Council [...] any appropriate proposals, which may include [...] inclusion in the Community scheme of importers of products which are produced by the sectors or subsectors [exposed to a significant risk of carbon leakage].[66]

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[61] Article 10a-12, Directive 2009/29/EC. The list of sectors and subsectors exposed to carbon leakage is included in Decision 2010/2/EU and Decision 2011/278/EU, which were later amended by Decision 2011/745/EU.

[62] Nomenclature statistique des activités économiques dans la Communauté européenne (Statistical Classification of Economic Activities in the European Community).
See http://ec.europa.eu/competition/mergers/cases/index/nace_all.html for the full list.

[63] The criteria for Quantitative Assessment are: 1) the additional costs per gross value added and 2) trade intensity with 3rd countries. Sectors or subsectors that are considered to be exposed to a significant risk of carbon leakage would be: trade intensity over 30% (met by 117 sectors/subsectors) OR additional CO_2 cost over 30% of gross value added (met by 27 sectors) OR trade intensity over 10% AND additional CO_2 cost over 5% of gross value added (met by 2 sectors).

[64] Australian Trade & Industry Alliance, Briefing Note – How the Carbon Pricing Scheme Risks Manufacturing Jobs, September 2011

[65] Id.

[66] Directive 2009/29/EC, Article 10b.

There are several studies concerning choice of design of border adjustment if the EU implements such a system alongside the ETS, such as EU-imposed carbon tariffs on the US.[67] Whichever policy design is adopted, it would address carbon leakage and competitiveness concerns in a manner that follows the Kyoto Protocol notion of "common but differentiated responsibility" and complies with the GATT as expressed in Directive 2009/29/EC:

> Such a system could apply requirements to importers that would be no less favorable than those applicable to installations within the Community, for example by requiring the surrender of allowances. Any action taken would need to be in conformity with the principles of the UNFCCC, in particular the principle of common but differentiated responsibilities and respective capabilities, taking into account the particular situation of least developed countries (LDCs). It would also need to be in conformity with the international obligations under the WTO agreement.[68]

In fact, the EU has begun the preliminary use of a border adjustment measures in order to mitigate the climate impacts of aviation through Directive 2008/101/EC.

With few exceptions, under Directive 2008/101/EC, all planes landing in or leaving from the EU must hold emissions allowances for each ton of CO2 emitted as of January 2012, irrespective of the nationality of the operator or the ultimate destination of the aircraft.[69] In the event that airlines fail to submit allowances to cover their CO2 emissions, they are required to pay a penalty of 100 Euros per ton of CO2, in addition to the cost of purchasing permits to cover their CO2 emissions. There have been fervent debates regarding its effect on the cost of air transport for goods and thus on international trade.[70]

As a result of the new measure, there are concerns of increased plane routes just outside the EU and to the non-EU airlines that serve those airports.[71] Also, one

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[67] See J. Bhagwati and P.C. Mavrodis, " Is action against US exports for failure to sign Kyoto Protocol WTO-legal?," *World Trade Review*, 2007, p. 299-310.
[68] Para. 25 of the Preamble of Directive 2009/29/EC.
[69] Directive 2008/101/EC, para. 16; see also Id., Preamble, para. 18 (stating that an exception to the scheme is small airlines operating less than 243 flights/period for three consecutive four-month periods.)
[70] See, for example, J. Faber and L. Brinke, "The Inclusion of Aviation in the EU Emissions Trading Scheme: An Economic and Environmental Assessment", ICTSD Global Platform on Climate Change, Trade and Sustainable Energy, September 2011. Available at: http://ictsd.org/downloads/2011/11/the-inclusion-of-aviation-in-the-eu-emissions-trading-system.pdf
[71] Id.

of the main questions raised by this Directive is whether the EU has the power to regulate airlines in respect of emissions produced outside the EU by the inclusion of non-EU flights into the ETS scheme. It's a policy following the notion that "extending a domestic carbon price to imports is […] a necessary price for making progress domestically on reducing CO2 emissions."[72] Countries imposing the measure include India, Russia, China, and the US. India is considering its retaliatory steps while the ATAA (Air Transport Association of America), American Airlines, Continental Airlines and United Airlines challenged the High Court the measure taken by the UK to implement the Directive.[73] The case was referred to in the European Court of Justice, which on December 21, 2011 ruled that the Directive with provisions designed to prohibit discriminatory treatment between aircraft operators on nationality grounds was permissible the EU-US Air Transport Agreement.[74] Nonetheless, EU's trade partners have threatened to challenge this measure before the WTO Dispute Settlement Body.[75] The outcome of such a case is uncertain and there are disagreements among scholars on the measure's compatibility with the WTO law. While a recent study published by the ICTSD asserts that the measure is non-discriminatory and treats all airlines (EU and non-EU) the same and therefore arguably compatible with WTO's principle of non-discrimination,[76] another study argues to the contrary, indicating that a WTO member cannot justify discrimination under the Chapeau to Article XX and Article

[72] Joshua Meltzer, "Climate Change and Trade – the EU Aviation Directive and the WTO", Journal of International Economic Law, Volume 15, Issue 1, March 2012.
[73] Opinion of Advocate General Kokott, Case C-366/10, The Air Transport Association of America and Others v. Sec. of State for Energy and Climate Change, 2011, available at: http://curia.europa.eu/juris/document/document.jsf?docid=110742&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&cid=476586. (The parties alleged that the inclusion of aviation in the EU ETS is in violation of international agreements such as the Chicago Convention, the Kyoto Protocol and the "Open Skies Agreement" between the US and various EU Member States.)
[74] Id. (The ECJ also ruled that the inclusion of aviation activities in the EU ETS infringes neither the principle of territoriality nor the sovereignty of third countries.)
[75] Giovanni Bo, The US Challenge to the Inclusion of Aviation Activities within the EU Emissions Trading Scheme: A US-EU Dispute with Global Repercussions, September 2011, Worldbank News. http://go.worldbank.org/R9DWZ1RBC0
[76] J. Faber and L. Brinke, supranote 71.

XIV GATT on the basis that it needs to comply with its international obligation[77] and the measure could incur *de facto* discrimination due to its reliance on geographical facts (distance from the EU).[78]

In addition to attempting to influence CO2 emissions through the aviation Directive, the European Climate Change Programme's Working Group is discussing implementing a similar extension to maritime shipments if no effective global reduction commitments are to be included in the International Maritime Organization and UNFCCC process.[79] One of the topics studied by the Working Group is maintaining and enhancing competitiveness.[80] This study and reviews of Directive 2009/29/EC could in fact inform experts in this area on how best to craft a model global carbon reduction and linkage policy.

b) Australia (carbon tax)

In addition to making informed decisions based on what is happening with the EU-ETS scheme, the U.S. should consider the linkage approaches utilized by nations implementing a carbon tax schemed. In particular, Australia is often noted for its reputable carbon tax regime, and therefore will be the subject of our analysis.

The Clean Energy Legislation in Australia sets a fixed carbon tax of 23 Australian Dollars per ton in the 2012-2013 ($A24.15 in the following year,

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[77] The author cites *Brazil — Measures Affecting Imports of Retreaded Tyres,* WT/DS332/AB/R, Appellate Body Report, to show that WTO prevents Members from seeking to circumvent their WTO obligations by entering into contradictory international agreements.

[78] There could be discrimination between products from countries that are not equidistant from the EU, and between products from equidistant origins if it is relatively easier for products of one of these countries to fly to the EU on an indirect flight, incurring lower compliance costs. See Lorand Bartels, "The Inclusion of Aviation in the EU ETS: WTO Law Considerations", ICTSD Global Platform on Climate Change, Trade and Sustainable Energy, April 2012. Available at: http://ictsd.org/downloads/2012/05/the-inclusion-of-aviation-in-the-eu-ets-wto-law-considerations.pdf

[79] European Commission Climate Action, "Reducing Emissions from the Shipping Sector ", available at: http://ec.europa.eu/clima/policies/transport/shipping/index_en.htm
Also see: http://www.imo.org/ourwork/environment/pollutionprevention/airpollution/pages/ghg-emissions.aspx for the Study by the International Maritime Organization on reduction of GHG emissions through technical and operational measures.

[80] See http://ec.europa.eu/clima/policies/eccp/second/stakeholder/index_en.htm

$A25.40 in 2014-2015) on the top 500 polluters[81] starting from July 2012, but then moves to an emissions trading scheme by July 2015. The government projects the tax revenue of approximately $24.5 billion over three years, of which $15.3 billion will be used to assist households affected by the tax and industries which may be particularly impacted.[82] Specifically, the Jobs and Competitiveness Program under the Clean Energy Legislation is designed as its primary initiative to safeguard Australia's trade exposed industries. Targeted towards "industries that conduct trade-exposed activities and have the most significant exposure to a carbon price," it is to provide $9.2 billion in assistance between 2012 and 2015.[83] The Legislation defined 43 industrial "activities" from 25 sectors that will receive transitional assistance under the Jobs and Competitiveness Program. Also the Program provides Australian firms engaging in "emissions-intensive" and "trade-exposed" industrial process, an initial eligibility for either 94.5% (for the most emissions-intensive trade-exposed activities) or 66% (for less emissions-intensive trade-exposed activities) shielding from the carbon price, with 1.3% reduction of assistance each year to encourage industry to cut pollution.[84] The Australian government will also provide income tax cuts, higher Family Tax Benefits, and increases in pensions, allowances and other Government benefits in order to support households, for whom the cost of living is forecasted to increase 0.7% average.[85] Also 22% of manufacturing value added will be covered by assistance

[81] The preliminary list of companies that will be taxed, as of May 5, 2012, include 248 companies, most of which are power generators, mining companies, and heavy industry firms. See David Wroe, "Carbon tax hit list below expected 500 companies", The Sydney Morning Herald, May 5, 2012.

[82] Chiara Pazzano, "Q&A: How does the carbon tax work?", World News Australia, 16 May 2012. Available at: http://www.sbs.com.au/news/article/1650825/Q&A--How-does-the-carbon-tax-work-

[83] Australian Government (2011). Securing a Clean Energy Future : The Australian Government's Climate Change Plan. *Clean Energy Future*. Retrieved March 20, 2012, from: http://www.cleanenergyfuture.gov.au/wpcontent/uploads/2011/07/Consolidated-Final.pdf

[84] Commonwealth of Australia (2011), Securing a Clean Energy Future: The Australian Government's Climate Change Plan, www.climatechange.gov.au/

[85] Id.

under the Joint Competitiveness Program and approximately 41% of manufacturing exports will be eligible for safeguards. [86]

Arguably, compared with the EU ETS, the Australian competition provisions outlined by the Jobs and Competitiveness Program are not sufficient to protect the country's manufacturing jobs.[87] Under the EU ETS, approximately 8% of EU GDP is covered by its provisions concerning carbon leakage, while the Australian program only covers 2%.[88] The analysis further indicates that while 126 of European manufacturing and mining sectors receive assistance, their direct Australian competitors will be fully exposed to the higher carbon price.[89] Also the share of national employment that receives assistance will be 7% of the EU-27 employees while only 1% of the Australian jobs.

This analysis may suggest that the competitiveness measures under the Australian tax do not provide as much coverage as the EU ETS and may not be adequate to address competitiveness of the country's exporting sectors and import-competing sectors.

B. Policies using Standard-Based Measures

a) EU – Biofuels Standard

In addition its cap and trade program to reduce carbon emissions, the EU has also created a regulatory framework to promote the use of biofuels which has border implications. A part of a the EU energy and climate change legislation package is requiring Member States to introduce legislation and take measures

[86] Regulations to implement the Jobs and Competitiveness Program were made on 22 February 2012, and registered on the Federal Register of Legislative Instruments on 27 February 2012. The Clean Energy Regulator, responsible for the administration of the Jobs and Competitiveness Program, came into effect on 2 April 2012.

[87] Australian Trade & Industry Alliance (2011). "How the Carbon Pricing Scheme Risks Manufacturing Jobs". Available at: http://www.getcarbonpolicyright.com.au/act-now.aspx

[88] Australian Trade & Industry Alliance (September 2011). Briefing Note : How the Carbon Pricing Scheme Risks Manufacturing Jobs. *Minerals Council of Australia.* Retrived March 15, 2012, from http://www.minerals.org.au/file_upload/files/reports/ATIA_Manufacturing_jobs_Sep11.pdf

[89] See Carbon Tax Australian and European Union Comparison at: http://www.getcarbonpolicyright.com.au/act-now.aspx

necessary to ensure that certain country-specific target (ranging from 10% for Malta and 49% for Sweden) of total energy consumption in electricity generation, heating and cooling, and transport. Furthermore, Article 3.4 of the Directive sets a mandatory target of a 10% of energy to be used in the transport sector to be the form of energy from renewable sources.[90] Article 17 of the Renewable Energy Directive sets two criteria based on which biofuels would be deemed sustainable so that they can be counted towards the target: the percentage reduction of GHG emission should be above a certain level (starting at average 35% until the end of 2016), and it specifies criteria the land from which the raw materials are used for producing biofuels.[91]

Because today's current cost of biofuels is higher than fossil fuels, the regulatory target set by each Member State will not be achieved through market forces alone. In order to ensure that biofuels take 10% share of the energy consumption in transport, Member States can: 1) reduce or waive excise taxes for biofuels or 2) set mandatory blending requirements for producers or consumers, or 3) subsidize the production or consumption of biofuels. These measures would help increase consumer demand for biofuel and consequently give an advantage to biofuel producers, both EU and foreign.

Since the imported biofuels, which the European Commission projects would take around 30% of the biofuel demand in the EU, also has to meet the sustainability criteria, this requirement may act as a type of border adjustment of standard to imports based on the production process. This could raise a question whether the standards set in the Directive are consistent with the WTO law.[92]

[90] Renewable energy has various sources but for transport the main source is biofuel.

[91] The land-use requirement includes: Biofuels shall not be made from: 1) raw material obtained from land with high biodiversity value, 2) from raw material obtained from land with high carbon stock in or after January 2008, 3) from raw material obtained from land that was peatland in January 2008.

[92] See Alicia Giraudel and Benedikt Pirker, "Questions of Compatibility with WTO Law of Trade Measures Taken Under a New Climate Change Protocol", IHEID Trade and Investment Law Clinic's legal memo prepared for Oxfam International, 2010, for a discussion regarding consistency of these options with GATT.

b) California

Border measures can even be seen at the state level in the United States. Already California has enacted climate change legislation, although it still has some hurdles to overcome, as reflected in a recent California case, Rocky Mountain Farmer Union, et al. v. Goldstene, et al., Case 1:09-cv-02234-LJO-GSA (E.D. Cal. 2011). That case highlights the issues forthcoming when a state implements carbon reduction policies and tries to link said system with imports from other states that do not have a comparable mechanism.[93] Domestically, such trade measures face at least two major challenges: (1) federal pre-emption and (2) pre-emption that precludes state action that conflicts with U.S. foreign policy. California essentially imposed a unilateral carbon pricing mechanism and a unilateral border measure on transportation fuel. The legitimacy of the measure was challenged and found unlawful, and a preliminary injunction was granted to the biofuel and oil producer plaintiffs.

Rocky Mountain Farmers Union relates back to a state climate change legislation entitled the California Global Warming Solution Act (the "Act"). In particular, the Act requires that 33 percent of consumer energy demand be met by renewable energy by 2020, along with a 10 percent reduction in the carbon intensity in transportation fuels. In connection with the Act, the California Air Resource Board ("CARB") passed the Low Carbon Fuel Standard ("LCFS" or "Program"). The Program was designed to only apply to transportation fuels sourced within California and those sourced outside California (be it in another US state or imported from a foreign country).

Fuel providers were required to calculate the carbon intensity of each fuel component to determine their score. If this score was below a statewide average carbon intensity level (which decreases over time), the provider gets credits. If the score is above that average, credits must be purchased. The full fuel-cycle was considered when determining intensity of transportation fuel in CA. In other

[93] See W.D. Nordhaus, "Economic Issues in a [sic] Designing A Global Agreement on Global Warming," (Copenhagen, Denmark, 2009). ("Within the United States, some regions are energy exporters and resist measures to tax carbon fuels, while others are environmentally oriented and have already enacted local legislation to limit carbon emissions.").

words, the standard related to the total amount of carbon emitted during the entire life cycle of the fuel, including its extraction, refinement and production process, as well as transportation to California. So is similar to what EU does with biofuels whose total emissions from its use includes emissions from the extraction or cultivation of raw materials, processing, transport and distribution, as well as from the fuel in use. Here, California corn-derived ethanol pathways were assigned 10% lower carbon intensity scores as compared to the Midwest counterpart pathways. The higher carbon intensity value to corn value was based on the location of the production facility because of the longer transportation distances than a California based production facility.

The court ruled that the LCFS impermissibly discriminated against out-of-state corn ethanol and impermissibly regulates extraterritorially in violation of the dormant commerce clause. The court's decision did not take issue with CARB's asserted authority to impose carbon dioxide restrictions and stringent reporting requirements. Instead, the decision requires CARB rules to avoid discriminating against fuel sources based on where they are produced. As stated in the decision, " . . . the different treatment between out-of-state providers and identical in-state providers is facially discriminatory and thus must meet strict scrutiny, ... the highest level of constitutional scrutiny," and "in order to survive, a law must not only forward a compelling interest of the state, but it must be narrowly tailored to reach that goal." Therefore, "if there are other methods of accomplishing the goal that do not discriminate, then the law will fail." Further, the Court was weary of a legislation based on a lifecycle analysis of fuels, stating that one of two outcomes may occur:

> Outcome 1:
> The ethanol market would be Balkanized since a producer would have strong incentives to either relocate its operations in the State of largest use, or sell only locally to avoid transportation and other penalties.
>
> Outcome 2:
> There is danger that inconsistent legislation, if adopted by sister states, would cause significant problems to the ethanol market. Ethanol producers and suppliers in any State would be hard-pressed to satisfy the requirements of 50 different low carbon fuel standards which may be required at 50 different levels of reductions over 50 different time periods.

The case illuminates the complexity of implementing some form of a border measure, and the decision can be seen as a precursor for future challenges on border adjustments on an international level. For example, replace "California" with the "U.S." and replace the plaintiffs with "Foreign States" challenging the legitimacy of the border measure. Indeed, the case can already be contrasted with the ECJ aviation decision where the EU is taxing activity outside of its territory (i.e. flight above ocean). The matter also highlights the computational complexity associated with determining a carbon footprint and price/credit when the carbon embodied in any particular goods increases exponentially as the supply chain get longer.

Despite these hurdles, under the Act, California proceeded with something similar but different than the Program but in fact different. Today, California has a regional cap-and-trade program with an enforceable compliance obligation beginning with the 2013 GHG emissions.[94] The cap-and-trade program has a linkage model whereby there is a pool of participants (in this case, with British Columbia, Ontario, Quebec and Manitoba through the Western Climate Initiative).[95] This is discussed in more detail in Section III: Merging the Different Carbon Reduction Regimes, which bullets some viable linkage options.

C. Other Climate Change and Carbon Reduction Policies

China

Although used in limited fashion by EU-ETS and Australia, and attempted to be used by California, other countries are attempting to link the fragmented carbon regimes without border adjustments. These countries include China, India, and Brazil.

Currently China's stance in climate change policy focuses mainly around the goal of energy efficiency to adopt its economy to rapidly rising energy demand and the long-term energy development. This approach is very similar to that of Russia,

[94] See California Air Resource Board website discussing the California cap-and-trade program, available at: http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm
[95] Id.

India and other developing countries (*see Table 1 annexed with this memorandum*). China announced its plan to begin a comprehensive climate change law in November 2010. Its 12th Five-Year Plan in March 2011 includes a target of 40-45% reduction of carbon intensity of its GDP from 2005 levels by 2020.[96] Ministries and provinces will develop the specific policies and mechanisms. Notably, it has announced a pilot ETS program for Beijing, Tianjin, Shanghai, Chongqing, Shenzhen, Hubei and Guangdong.[97] The competition provision in the pilot program is also based on the concept of free allocation of emission quotas by the Municipal Government.[98]

In addition to this trial program, more recently, China has imposed high export tax on carbon-intensive products, e.g. iron/steel and aluminum.[99] In theory this form of indirect carbon pricing can have comparable effect of reducing CO2 emissions as well as mitigating competitiveness concerns of their trade partners while the tax revenue is kept for China.[100] However, arguably, China's export taxes on carbon-intensive products are meant to leverages its position in the world market rather than address climate change.[101] It is unlikely that other developing countries with no carbon mechanism in place would adopt such export tax approach unilaterally unless it is included in a multilateral agreement, which can hardly be adopted in the current context when the post-Kyoto Protocol negotiations are still in deadlock.

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[96] In addition to the reduction of carbon intensity, the Plan also sets increased number of pollutants included in the 'total emission control' system, sets new targets for the energy intensity of GDP, the percentage of non-fossil fuel energy, and an increase in forest coverage.

[97] Inside China, Newspaper, "Beijing to start carbon emissions trading pilot intends to force into 600 units", at http://insidechina.onehotspots.com/beijing-to-start-carbon-emissions-trading-pilot-intends-to-force-into-600-units/24281/ (last consulted on 20 April 2012).

[98] Id.

[99] Circular Fa Gai Jing Mao No. 2595 (2005) provides the legal grounds for such export policy.

[100] Indeed, B. Muller and A. Sharma have pointed out that the use of export duty on carbon-intensive products may be a key element settling the deadlock of developing countries' participation in post-2012 climate negotiations (B. Muller and A. Sharma (2005), Trade Tactic Could Unlock Climate Negotiations, SciDev.Net, 17 June 2005).

[101] Susan Droge, supranote 15, p.65-66.

India

Another country implementing a form of carbon reduction scheme that does not use market prices is India. In the last two decades India has made significant efforts in reducing its energy intensity by improving energy efficiency, increased use of renewable and energy pricing reforms.[102] In 2008 India adopted its first 'National Action Plan on Climate Change' aimed at climate change mitigation and adaptation. The plan's eight "national missions" to promote solar energy, sustainable habitat, increased forest cover and research fund, among others. Additionally, in 2010, India announced a levy on coal at the rate of 50 rupees per ton that applies to both domestic and imported coal. This measure could be considered a limited carbon tax with a competition provision. However, given that it only covers coal products, it probably does not have significant effect on reducing GHGs emissions compared with India's national emissions.

Brazil

Like China and India, Brazil is also developing carbon reduction policies without market-based prices. Brazil passed its National Policy on Climate Change (Law No. 12187) in December 2009, establishing its voluntary emission reduction target of 36.1% to 38.9% of projected emissions by 2020.[103] This seemingly broad policy leaves specific implementation measures to be established by decree. The policy attempts to achieve the target primarily through reducing deforestation and increased use of renewable energy sources in generating its power.[104] The policy further foresees the creation of a cap-and-trade system. However, discussions on the possible implementation of such a mechanism are under way at state level in Sao Paulo.[105]

Due to its particular ecological conditions, Brazil considers forestation as an effective means to reduce GHGs emissions.[106] It is participating actively in the Kyoto Protocol's CDM by hosting a large number of carbon offset projects, especially those

[102] GLOBE Climate Legislation Study, GLOBE International, Grantham Research Institute on Climate Change and Environment, 2011.
[103] Id.
[104] Id.
[105] Section on Brazil, Id.
[106] Id.

with reducing emissions from deforestation and degradation (REDD[107]).[108] Like China and India, Brazil also considers the use of renewable energy as an effective way to reduce GHGs emissions.

D. Countries with no Carbon Reduction Policies

The countries that are least helpful when reflecting on how other nations have crafted carbon reduction policies, and perhaps address how to link its system with the rest of the world, are least developed nations and OPEC countries. It is not surprising that many developing nations cannot, or do not, participate in carbon reduction regimes at this time for a multitude of reasons such as lack of capacity, technology, and financial means, all of which have been highly discussed and documented in connection with the Kyoto Protocol, and post-Kyoto negotiations.[109] With respect to OPEC countries, due to their high dependence on the export of fossil fuels, the realization of reaching the Kyoto targets through carbon tax in OECD countries is believed to bring much loss in their export revenue.[110] Not surprisingly, OPEC called for the use of advanced technology, such as Carbon Dioxide Capture and Storage (CCS), which is based on removing harmful gases from major industrial activities, and storing it or injecting it into mature oilfields to boost reserves. With the "dual benefits of reducing carbon dioxide emission into the atmosphere while enhancing oil recovery", this approach may address their problems associated with reduction in oil and gas consumption caused by the adoption of strict emission standards by industrialized countries.[111] Whether the lack of a carbon policy among these countries is to free ride, maintain profitability on the export of fossil fuels, or due to insufficient technology, the U.S. must address these players when designing its own policy.

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[107] REDD increases GHGs removals from enhancement of forest carbon stocks, forest conservation, and sustainable management of forests.
[108] Townshend et al., supranote 102.
[109] See, for example, Babiker et al., "The Kyoto Protocol and Developing Countries", MIT Joint Program on Science and Policy of Global Change, 1999.
[110] Ghanem et al., "The Impact of Emission Trading on OPEC", OPEC Review, Vol. 23, Issue 2, 1999.
[111] "OPEC Urges Use of Technology to Reduce Carbon Emissions", Terra Daily, Sept 21, 2006. Available at: http://www.terradaily.com/reports/OPEC_Urges_Use_Of_Technology_To_Reduce_Carbon_Emissions_999.html

The above analysis shows that carbon-pricing mechanism is only one among a multitude of options for reducing GHGs emissions. Even if carbon pricing is assumed to be the most effective model and has been already implemented by some of the big emitters such as the EU and Australia, it might not be the best political and economical solution for other emitters like China, Brazil, India and OPEC countries, not to mention the least developed countries which only contribute a small part to the global GHGs emissions.

In light of all of the above, there is a range of options on how to approach competitiveness concerns – some that are executed by other nations, and some that are not. Bearing this in mind, this paper now turns to examine more closely the question of how to merge these different carbon reduction regimes.

III. Merging the Different Carbon Reduction Regimes

A wide range of policy options have been developed to address carbon leakage and competitiveness concerns within the countries regulating carbon emissions.[112] This chapter, however, focuses on the "merging tools" for a domestic carbon pricing mechanism that can actually link up the different carbon reduction regimes discussed in Section II above and pave the way to link global carbon prices. The two essential "merging tools" discussed in this section are "A. Increasing the Pool of Participants to Carbon Markets" and "B. Border Measures through a Unilateral Linkage System". Both measures affect trade and are intended to address competition concerns, and thus may be challenged under WTO law. In addition, each way of linkage has its particular features that may have significant practical implications for domestic competitiveness, as well as the administrative and environmental effectiveness of the carbon policy. Therefore, if either of these linkage approaches is selected by the U.S., it shall be carefully constructed bearing in mind both WTO and policy implications. For that reason, this paper will discuss each type of linkage by looking at its design and considering the practical challenges it may face, then addressing its possibility to pass muster under a WTO-challenge.

[112] See Trevor Houser et al., "Leveling the Carbon Playing Field: International Competition and US Climate Policy Design", Peterson Institute for International Economics and World Resources Institute, Washington DC, 2008, for a detailed discussion on these policies options.

A. Linkage By Increasing the Pool of Participants to Carbon Markets

Under a cap-and-trade system, there are two different ways to addressing competitiveness and carbon leakage concerns through linkage. The carbon regulating countries may either: (i) link to other carbon reduction regimes (carbon tax, cap-and-trade, standard-based measures or other regimes) by unilaterally imposing border measures on imported products (which will be discussed in Section B. below), or (ii) establish a link to other carbon markets. This section deals with the second way of linkage between carbon markets by *firstly*, introducing different types of linkable carbon markets with concrete examples; *secondly*, discussing the types of links between those carbon markets; *thirdly*, discussing the practical challenges to linking carbon markets; and *finally*, addressing WTO implication of linking carbon markets.

a) Linkable Carbon Markets

Here, it should be noted that carbon markets does not only comprise of carbon emissions trading schemes ("ETS") under cap-and-trade systems but also carbon offset markets under emission reduction credit systems, which can be established under the flexible mechanisms of the Kyoto Protocol (Joint Implementation mechanism ("JI") or Clean Development Mechanism – "CDM") or domestic offset programs.

Under the Kyoto Protocol's CDM, certified emission reductions (CERs) are awarded for voluntary emission reduction projects in developing countries that ratified the Protocol, but are not among the Annex I countries subject to the obligatory emission reduction targets. CERs are credits awarded for each ton of CO2-equivalent emission reductions. While CERs can be used by Parties to the Protocol to meet their emission reduction target committed under the Protocol, they also may be used for compliance purposes by entities covered by various cap-and-trade systems, including systems in countries that are not Parties to the Protocol.

Like the CDM, Joint Implementation (JI) was established as a project-based flexibility mechanism under the Kyoto Protocol. But unlike the CDM, the Kyoto Protocol's JI applies to emission reduction projects carried out in an Annex I

country (the host country) that itself has a national emissions target under the Protocol. JI projects generate credits, referred to as emission reduction units (ERUs) that can be used to cover increased emissions in other countries. When these credits are generated, a corresponding reduction is made in the host country's emissions target under the Protocol. This ensures that the use of ERUs to cover increased emissions in another country is, in fact, offset by a net reduction in the host country emissions.

Examples of CDM and JI projects are renewables and energy efficiency projects (i.e. construction of low-carbon energy plants, construction of hydro-power plants) or carbon sinks projects (i.e. forestation projects to absorb carbon emissions through the photosynthesis process or carbon capture and storage projects – using technology to capture CO2 emissions, transport it and ultimately, pumping it into underground geologic formations to securely store it away from the atmosphere).

Domestic offset programs may be established by certain cap-and-trade systems for creating emission reduction credits that can be used by regulated entities to meet compliance obligations. For example, electricity generators covered by the Regional Greenhouse Gas Initiative ("RGGI") can use offset allowances to cover a portion of their emissions. RGGI has established a set of project types that can be implemented to generate offset allowances, and standards for determining the number of allowances that a project will be awarded. Cap-and-trade systems proposed in Australia, Canada and the United States also include offset programs.

Linking occurs when a cap-and-trade system allows covered parties to use emission allowances or emission reduction credits from another system in order to meet their domestic compliance obligations.[113] Indeed, there are some clear considerable benefits that induce governments to move forward on linking, such as increase of liquidity and improvement of market's functioning by bringing more sellers and buyers to the carbon market, i.e. "increasing the pool". Linking also helps to reduce overall abatement cost by allowing emitters to choose lower cost reductions in one cap-and-trade program instead of higher cost reductions in the

[113] Such linkage of domestic tradable permit systems is completely different from the state-to-state trading envisaged under Article 17 of the Kyoto Protocol, whereby signatories to the Protocol can trade their "assigned amounts."

other program. In addition, it may reduce economic dislocation when entities in different programs face the same carbon price (i.e. reduce carbon leakage). Nevertheless, linking carbon markets may involve great practical challenges due to the differences in the design of carbon markets. The next section will introduce the types of links that could be established between existing and emerging carbon markets, and then briefly discuss the practical challenges to linking carbon markets.

b) Types of Links for a Cap-and-Trade System

There are 2 types of links for a cap-and-trade system: direct link and indirect link.

- **Direct link**

(i) between cap-and-trade systems:

A direct link can be established between two or more ETS. Such linkage should permit emissions allowances to be freely traded across different ETS. In other words, two carbon markets are directly linked when a participant in one emission-trading scheme can use an emission allowance issued under one scheme to meet compliance obligations under another scheme. Under a direct linkage, carbon units must be considered equivalent for compliance purposes.

Direct link could be either:

- *Unilateral:* A unilateral link can be established where a system recognizes compliance instruments from another program to meet compliance obligations in its own program but not *vice-versa.* An illustration is the proposed link in the US Lieber-Waxman Bill 2009, which allows a US importer to submit, in lieu of an international reserve allowance issued by the EPA, a foreign allowance or similar compliance instrument distributed by a foreign country pursuant to a cap and trade program that represents a comparable action.[114] This type of link is also provided in the Australia's Clean Energy Bill of 2011, which prepares to

[114] Section 2501 of the US-CSA of 2008.

recognize emissions trading allowances issued by other ETS to which Australia will link, such as the EU-ETS and New Zealand-ETS.[115]

- *Bilateral:* A bilateral link can be established between two ETS. The Australia and New Zealand's proposed linking project is an illustration for this type of link.
- *Multilateral:* A multilateral link can be established between more than two ETS. An illustration for this type of link is the current link between the EU-ETS with non-EU national scheme of Liechtenstein, Norway and Sweden, or the proposed Regional Greenhouse Gas Initiative (RGGI) to set up links between certain states and provinces in the Northeastern United States and Eastern Canada.

(ii) between a cap-and-trade systems and an emission reduction credit system:

The cap-and-trade system includes in their carbon legislation a provision to recognize emission reduction credits from the credit system. Because the credit system does not place requirements on entities to surrender credits or allowances, this linkage can only unilaterally established by the cap-and-trade's regulatory authority. If the price of credits is lower than the price of emission allowances, then regulated firms in the cap-and-trade system have an incentive to purchase credits. This will reduce the price of allowances in the cap-and-trade system and increase the price of credits in the credit system until the two prices converge.[116] A concrete example for this type of link this the EU's "Linking Directive" (2004/101/EC), which enables EU-ETS participants to use CDM CERs to meet compliance obligations beginning in 2005, and JI ERUs beginning in 2008.[117]

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[115] Australian National Registry of Emissions Unit Bill 2011, consequential to the Clean Energy Bill 2011 ("eligible international emissions unit means . . . .a non−Kyoto international emissions unit", the term 'non-Kyoto international emissions unit has been substituted with references to 'prescribed international emissions units' in order to ensure the Registry can account for a range of possible market mechanisms in other countries to which Australia will link. See Clean Energy (Consequential Amendments) Bill 2011, Commentary on Provisions, Chapter 4 Amendments to the Australian National Registry of Emissions Units Bill 2011). See also: Joseph Tohill, Australia's Carbon Price Passes Senate; Seeks ETS Link With EU And NZ, The9billion.com, on 11/10/2011.

[116] Directive 2004/101/EC, para. (2) and (5).

[117] The Directive places restrictions on this linkage, however. CERs and ERUs generated from nuclear facilities, land use change, and forestry activities are not

- **Indirect link**

Under an indirect link, two programs effectively become linked to each other because each has linked to a third program. The third program could be another emission trading scheme or a carbon offsets markets. For example, the Norway and RGGI are not linked directly but they can be linked indirectly if both RGGI and Norway-ETS directly link to the EU-ETS. Alternatively, if both the EU-ETS and CPRS linked unilaterally to the Clean Development Mechanism (CDM), the two programs would still be indirectly linked to each other. In particular, CRPS buying CDM credits would require EU ETS emitters to find other abatement options.

c) Practical Challenges to Linking Carbon Markets

If countries desire to link their emissions trading schemes, they could (i) enact legislation to unilaterally recognize emissions allowances or carbon credits issued under another carbon markets; or (ii) negotiate and enter into an agreement to mutually recognize the carbon units issued under the other scheme. However, there exist certain practical barriers to linkage. Some challenges are easier than others to overcome in the short term, such as differences in monitoring, reporting, and verification, banking, registries, compliance periods, and allocation methods.[118] Meanwhile, other practical barriers such as differences in the stringency of targets and enforcement provisions are more difficult to overcome, because there are variations in the eligibility of offset credits, the use of intensity targets, and cost containment measures. Therefore, although some harmonization of the design between cap-and-trade systems may be necessary to facilitate links between them, great different approaches in allocations methods and monitoring, reporting and enforcement mechanism may prevent the link to be established.[119] Indeed,

recognized, and quantitative limits are placed on the use of CERs and ERUs. The effects of this linkage are already apparent in secondary markets for CERs, where CER prices have closely tracked Phase II EU ETS allowance prices.

[118] Andreas Tuerk et al., "Linking Carbon Markets: Concepts, Case Studies and Pathways", Climate Policy, Vol. 9, No. 4, 2009, p. 341-357.

[119] Judson Jaffe and Robert Stavins, "Linking Tradable Permit Systems for Greenhouse Gas Emissions: Opportunities, Implications, and Challenges", Analysis Group, prepared for: International Emissions Trading Association, November 2007. Available at:

prospects for links between systems are highest where nations already have close economic ties and a history of policy coordination.[120] For example, a link between EU-ETS and Switzerland-ETS is easier to be established than a link between EU-ETS and Australia-ETS, given the higher level of economic and political harmonization between the EU and Switzerland.

Another challenges could arise over time with respect to more ambitious long-term reduction targets, rising compliance costs, and impacts on economic competitiveness resulted from linking systems.[121]

d) WTO Compliance when Linking Carbon Markets

Notably, most commentators have suggested that linking carbon markets arguably falls outside the scope of WTO law because emission allowances would neither be characterized as "products" nor "services" for WTO purposes.[122] Therefore, a challenge to a measure in connection with a linking agreement, based on an argument that allowances warrant this characterisation, would find little support at present.[123]

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http://www.hks.harvard.edu/fs/rstavins/Monographs & Reports/IETA Linking Report.pdf

[120] Christoph M. Meitz, "Towards a Global Carbon Market: Legal and Economic Challenges of Linking Different Entity Level Emissions Trading Schemes", Amsterdam Conference on the Human Dimensions of Global Environmental Change, 2007.

[121] Id.

[122] There is a common consensus in the literature on this issue. See, for example, Werksman, J., "Greenhouse Gas Emissions Trading and the WTO", Review of European Community and International Environmental Law, Vol. 8(3), 1999; , A. Petsonk, "The Kyoto Protocol and the WTO: Integrating Greenhouse Gas Emissions Allowance Trading Into The Global Marketplace", Vol. 10 Duke Environmental Law & Policy Forum, 1999, p.185-220, at 200; Z. X. Zhang, "Greenhouse Gas Emissions Trading and the World Trading System", Journal of World Trade, Vol. 32(5), 1998, p. 219-239, at 225; G.M. Wiser, "Frontiers in trade: the clean development mechanism", International Global Environmental Issues, Vol. 2, Nos. 3/4, 2002, at 293.

[123] M. J. Mace, I. Millar, C. Schwarte, J. Anderson, D. Broekhoff, R. Bradley, C. Bowyer, R. Heilmayr, "Analysis of the legal and organisational issues arising in linking the EU Emissions Trading Scheme to other existing and emerging emissions trading schemes", FIELD-IEEP-WRI, Study commissioned by the European Commission DG-Environment, Climate Change and Air, May 2008. (However, it cannot be said that it would never warrant such characterization, as most WTO provisions are interpreted in a evolutionary manner and the notion of "product" may evolve over

B. Linkage Through Unilateral Border Measures

A border measure would preserve the international competitiveness of energy-intensive producers while maintaining the carbon price signal within the domestic economy. Despite the risk of high administration cost resulted from imposing border measures may undermine the ultimate goal of reducing GHG emission,[124] most existing and proposed carbon tax and cap-and-trade systems tend to incorporate this approach in their competition provisions. As previously discussed, border measures have been used by the EU under Directive 2008/101/EC to include aviation activities into the EU-ETS or under Directive 2003/30/EC setting standard for biofuels, by California under the Low Carbon Fuel Standard, or by India by imposing a fixed charge on both imported and exported coal. Below is a list of some of the existing or proposed border measures:

a) Types of Border Measures

Under a carbon tax regime, border measures can take the forms of:

- A tax on carbon-intensive products imported into the regulating country that are similar to the domestic products bearing the carbon tax (e.g. India's tax on imported coal); *and/or*
- A tax exemption on emissions entailed by the production process of the exported products by the regulating country (i.e., a refund of domestic carbon taxes when the products are exported, which is similar to the principle of Value-Added-Tax refund).

Under a cap-and-trade regime, border measures can take the forms of:

- A requirement to importers to surrender allowances for emissions induced by the production of the imported products – usually the importers have to fulfill this requirement by purchasing the allowances issued by the carbon regulating countries for this purpose[125]; and/or
- An exemption from the requirement to surrender emissions allowances to public authorities for the emissions (or part of the

time due to the absence of a fixed definition. See M. Martin, 'Trade Law Implications of Restricting Participation in the European Union Emissions Trading Scheme' (2007) Georgetown Int'l Environmental Law Review 437-474, available at: http://findarticles.com/p/articles/mi_qa3970/is_200704/ai_n19434218/pg_25).

[124] Laura Nielsen, "Border Carbon Adjustments, the UNFCCC, and WTO Rules", Proceedings of the Annual Meeting (American Society of International Law), Vol. 103, March 25-28, 2009, pp. 369-372.

[125] Examples are the "International Reserve Allowances Program" under the U.S. ACESA 2009 and requirement to airlines to surrender emissions permits by the EU in respect of CO2 emissions from aviation activities under Directive 2008/101/EC.

emissions) induced by the production of the exported products to exporters[126]; or

- A tax on carbon-intensive imports that is comparable to the cost of purchasing necessary emission allowances imposed on like domestic products.

Other types of border measures that have been envisaged by governments and in literature include:

- Imposing an import ban or punitive tariffs on imports from non-carbon-regulating countries[127];
- Imposing anti-dumping duty on imports from non-carbon-regulating countries (products from non-carbon-regulating countries are cheaper as they do not bear the cost for the emissions induced from their production, thus not pricing carbon is considered as a form of "environmental dumping");[128]
- Imposing countervailing duties on imports from carbon-unregulated countries to offset the arguable "subsidies" of not imposing carbon restrictions by those countries;[129]
- Imposing a CO2 charge on international transport based on their evaluated emissions of CO2[130]; or
- Imposing regulation standards in relation to the carbon emitted by the imported products.[131]

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[126] According to the monitoring mechanism of most cap-and-trade systems, companies must annually surrender emission allowances up to the amount they effectively emitted the preceding year. The companies do this themselves, surrendering the permits necessary to cover the emissions reported in the monitoring system of the competent public authority. An electronic system is established to check whether a company has surrendered sufficient emission allowances. Therefore, a company could be exempted from surrendering emission allowances for the products that it has exported in the preceding year if it has sufficient customs documents to demonstrate its actual exportation. The rebate for exported products is however not to be confused with the rebate program for domestic producers in sectors that are exposed to a high risk of carbon leakage based on their trade intensity and their percentage of emissions. Therefore, the respective rebate programs under the EU-ETS and the ACESA 2009 are not border measures for exported products.

[127] See e.g., Bhagwati and Mavroidis (2007), supranote 67, p. 301.

[128] For example, Joseph Stiglitz has proposed that Japan, Europe and other Kyoto parties should impose anti-dumping or anti-subsidy duties on imports from the United States. See Joseph Stiglitz, "A New Agenda for Global Warming", ECONOMISTS' VOICE, July 2006, available at:
http://www.bepress.com/cgi/viewcontent.cgi?article=1210&context=ev

[129] Id.

[130] Reuters, "France's Sarkozy seeks EU carbon tax, truck tax", 25 October 2007; Presentation of the Grenelle Environment Forum conclusions speech by M. Nicolas Sarkozy, President of the Republic, 2 November 2007.

[131] Examples are the EU's and California's biofuels standards.

b) Relevant WTO law

There is a common agreement in the literature that the precise design of any particular border measure will be crucial in determining whether it is WTO-consistent.[132] The design options will be analyzed further in the next section on "Practical Challenges to Implement Border Measures" where WTO compatibility of border measures imposed under selected carbon reduction policies is discussed in more detail. This current section, therefore, provides an overview on the WTO compatibility of all the types of border measures mentioned in the previous section, based on the result of the scholarly discussion on this issue.

The relevant WTO legal framework for evaluation of border measures are the provisions in The General Agreement on Tariffs and Trade (GATT), which underlies the principle of non-discrimination between domestic products and imported products (National Treatment, GATT Article III[133]) as well as among imported products (Most-Favored-Nation Treatment, GATT Article I[134]). In addition, depending on the actual chosen tool (a tax or tariff, an allowance rule or a regulation standard), other WTO Agreements, such as the Agreement on Anti-Dumping or the Agreement on Subsidies and Countervailing Measures, may come into play.

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[132] See e.g., A. Cosbey, "Border Carbon Adjustment", International Institute for Sustainable Development, Winnipeg, 2008; C.L. Weber and G.P. Peters, "Climate Change Policy and International Trade: Policy Considerations", Energy Policy, 37, 2009, p. 432–440; Joost Pauwelyn, supranote 6.

[133] GATT Article III:2 provides that imports 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, according to the *Ad Note* to GATT Article III, the importing country shall not apply internal taxes or other internal charges to domestic or imported products, including the "directly competitive or substitutable" products, so as to afford protection to domestic products. In addition, GATT Article III:4 provides that "all laws, regulations and requirements affecting the internal sale, offering for sale, purchase, transportation, distribution or use" of domestic and imported products must be design in such a way that they do not accord to imported products a treatment less favorable than that accorded to like domestic products.

[134] GATT Article I:1 provides that "any advantage, favour, privilege or immunity" granted by any WTO member to any product originating in or destined for any other country shall be accorded "immediately and unconditionally to the like product originating in or destined for the territories of" all other WTO member. GATT Article I:1 also provides that the scope of this treatment also extends to all matters referred to in paragraphs 2 and 4 of Article III.

Although there are still some disagreement in the detail, the outcome of trade law scholars' analyses concludes that certain border measures (e.g. anti-dumping or anti-subsidy duties) would most likely to violate WTO law while other border measures would be compatible with WTO law as long as they do not discriminate (i) between imported products and "like" domestic products[135], and (ii) among imported products originating from different countries.[136] Moreover, it has been suggested that certain violations of WTO law could be justified under the environmental exception in GATT Article XX(g)[137] *(see annexed Table 2 for a summary of border measures and their compliance with WTO law).*

Accordingly, in order to be justified under this exception, any violation of GATT must satisfy the two-fold test under the conditions of ***GATT Article XX(g)*** and the ***Chapeau of GATT Article XX*** (which sets the general conditions for all types of exceptions in this Article).

Conditions under GATT Article XX(g)

Any measure "relating to the conservation of exhaustible natural resources" but in violation of the substantive obligations under the GATT could be justified by GATT Article XX(g) if such measure is "made effective in conjunction with restrictions on domestic production or consumption". Therefore, for a carbon border measure to meet GATT Article XX(g) exception, three cumulative conditions must be met:

(i) The planet's atmosphere is an "exhaustible natural resource";
(ii) The domestic climate legislation must relate to the conservation of the planet's atmosphere;
(iii) The domestic climate legislation on imports must be "made effective in conjunction with restrictions on domestic production and consumption".[138]

[135] The question of "likeness" among products will be discussed at pages 47-48 of this memorandum.
[136] Joost Pauwelyn, supranote 6.
[137] Id.
[138] See Pauwelyn, supranote 6 for a detailed examination of the compatibility to these conditions of a carbon legislation. See also: Bradly J. Condon, "Climate Change and Unresolved Issues in WTO Law", Journal of International Economic Law, Vol. 12(4), 2009, p. 895-926; Been McGrady, "Necessity exceptions in WTO Law: Retreaded Tyres, Regulatory Purpose and Cumulative Regulatory Measures", Journal of International Economic Law, Vol. 12(1), p. 153-173.

A preliminary look at the carbon border measure would suggest that it would not be too difficult to pass the test under the GATT Art. XX(g). Indeed, earlier case law has affirmed that the atmosphere can be considered an exhaustible natural resource whose deterioration affects all states.[139] The second condition is likely not difficult to be met as the inclusion of border measure in the climate legislation is to prevent the risk of carbon leakage and to encourage other countries to participate in global climate efforts.[140] To satisfy the third condition, the carbon regulating country must ensure that the border measure imposed on imports reflects the restriction imposed on domestic products.[141] In other words, the trade restriction on imports must operate jointly with the restrictions on domestic production or consumption.[142] However, it is not necessary to show that such trade restriction must be aimed at ensuring the effectiveness of domestic restrictions.[143] Furthermore, it could also be argued that the third condition is satisfied by only applying the border measure to countries that have not taken "comparable action" and by exempting countries with low carbon emissions.[144]

Conditions under the Chapeau of the GATT Article XX

The Chapeau requires that a measure in violation of GATT and satisfies the above conditions in GATT Article XX(g) must not be "*applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade*". That is, it should not discriminate "*between countries where the same conditions prevail*".[145] From the previous decisions of the WTO's Appellate

[139] *United States - Standards for Reformulated and Conventional Gasoline*, WT/DS2/AB/R (Appellate Body Report), para. 14. See also Joost Pauwelyn, supranote 6.
[140] Joost Pauwelyn, supranote 6.
[141] Andrew Shoyer, "WTO Background Analysis of International Provisions of US Climate Change Legislation", Sidley Austin LLP, Washington DC, May 2008.
[142] *China - Measures related to the exportation of various raw materials*, WT/DS394/AB/R; WT/DS395/AB/R; WT/DS398/AB/R (Appellate Body Report), para. 356.
[143] Id., para. 360.
[144] Andrew Shoyer, supranote 141.
[145] United States - Import Prohibition of Certain Shrimp and Shrimp Products, WT/DS58/AB/R (Appellate Body Report), para. 181.

Body on environmental disputes, the three following elements would be referred to in order to evaluate the existence of such discrimination:

> (i) Does the domestic climate legislation take account of local conditions in foreign countries or it essentially requires that foreign countries adopt domestic policies?
> (ii) Before imposing the "unilateral" carbon tax or regulation on imports, did the carbon-restricting country engage in "serious, across-the-board negotiations with the objective of concluding bilateral or multilateral agreements to address climate change"?
> (iii) Does the implementation and administration of the climate legislation respect "basic fairness and due process"?[146]

The answers to these questions vary greatly depending on the actual design features of border measures, which will be further discussed in the next sections.

Having traced the WTO boundaries for which any carbon reduction policy seeking to protect competition and prevent carbon leakage must stay within, this paper now turn to an analysis of the unilateral linkage through border measures. Specifically, four important features in the design of a border measures, i.e. (i) Triggering the Competition Provisions, (ii) Targeted Products and Industries, (iii) Calculating the Carbon Footprint and (iv) Applicable Parties, will be assessed in terms of their WTO consistency, administrative feasibility, environmental effectiveness and competitive effectiveness.

c) Triggering the Competition Provision

In order to effectively address competition concerns and carbon leakage, in many cases, the border measures would need to be discriminatory and thus violate the WTO's principle of non-discrimination. However, this could be justified by the environmental exception under GATT Art. XX(g). In order to successfully invoke this exception, the border measures must also satisfy the conditions under the Chapeau of GATT Article XX, which requires, *inter alia*, that the implementing country engage in negotiations with the covered countries in good faith,[147] although a concrete result does not have to be met.[148] Therefore, for WTO purpose, (i) the implementing country should negotiate with other countries before enacting its

[146] See Pauwelyn, supranote 6 for a detailed analysis of the compatibility of a carbon legislation with these conditions.
[147] United States – Import Prohibition on Certain Shrimp and Shrimp Products, Appellate Body's Report, WT/DS58/AB/R, 12 October 1998, para. 156.
[148] Ibid, para. 176.

carbon legislation (which may then provide the implementation of border measures simultaneously with the entry into force of the carbon legislation), and (ii) in case where the implementing country has not entered in negotiations with other countries before enacting its carbon legislation, a grace period should be provided for notifications and international negotiations before resorting to unilateral border measures. For example, take a look at EU's Directive 2008/101/EC, which includes the aviation sector in the EU-ETS. The absence of a provision in this Directive calling for international negotiations and notifications before implementation could make the measure difficult to justify under WTO law, and specifically under the second condition of the Chapeau of GATT Art. XX(g) (*whether the carbon regulating country has engaged in serious, across-the-board negotiations with the objective of concluding bilateral or multilateral agreements to address climate change*).

Although the exact timeframe is difficult to tell, the entry into force of border measures must adequately balance the practical implications from different angles of the carbon policy. For instance, a relatively short grace period is more preferable in order to effectively address environmental and domestic competitive concerns. Meanwhile, from the administrative standpoint, the competent authorities may need more time to undertake multilateral negotiations before implementing a unilateral border measure.

If the U.S. undergoes these negotiations and then determines that it will implement a competition provision, its entry into force can be immediate. However, as a matter of good foreign policy, it is recommended that there should be a grace period between the time that the definite use of a competition provision is determined and when it goes into force. This will permit other countries some lead-time to develop and operate their national climate policies and measures.

Alternatively, the carbon legislation could intentionally omit strict implementation deadlines and delegate such task to the discretion of the Executive to determine whether a competition provision is found to be necessary after (i) X amount of years of a carbon reduction policy being in place or (ii) after X amount of years after no international carbon reduction policy is met. Indeed, such discretion may prevent other countries to challenge the border measures before it is actually implemented. Notably, pursuant to the principle of mandatory vs. discretionary

legislation in WTO case law, a discretionary legislation could not be challenged before the WTO, unless discretion is exercised contrary to WTO rules.[149]

d) Targeted products

In order to effectively address carbon leakage concerns and maintain the environmental integrity of an emission trading system, a carbon reduction policy will need to specify which industry sectors fall under its terms and how the provisions will be applied. This can have a profound effect on competition and linkage. Essentially, the covered products could range from a limited list of products to a maximalist approach, which includes many products including downstream products. S. Monjon and P. Quirion looked at this issue more closely in their study regarding a possible EU-ETS border adjustment. The authors suggested examining whether the downstream products are traded in large volumes between the EU and its trade partners, and to evaluate the extra cost they would support if the primary products they consume were covered by a border measure. Hence, downstream products that are little internationally traded or would bear negligible extra cost should perhaps be carved out.

Among the other considerations to bear in mind when determining covered products is a sector's ability to pass through the cost of carbon. This depends on a few characteristics, such as "direct and indirect costs, impacts on operational costs, capacity utilization or vertical integration."[150] The EU has already reviewed and come to a relatively large consensus on which industries are most susceptible to carbon leakage. Using that criteria, the EU ETS published a list of 164 exposed sectors, which was later expanded.[151] Meanwhile, according to other reports,

[149] *United States – Anti Dumping Act of 1916*, WT/DS136/AB/R; WT/DS162/AB/R (Appellate Body Report), para. 60-61 and para 88-91. In particular, a passage that sums up the GATT panels practice reads: "legislation which mandated action inconsistent with the General Agreement could be challenged as such, whereas legislation which merely gave the discretion to the executive authority of a contracting party to act inconsistently with the General Agreement could not be challenged as such; only the actual application of such legislation inconsistent with the General Agreement could be subject to challenge."

[150] Susanne Droge, supranote 15, at 6.

[151] EU Commission Decision 2010/2/EU.

limiting the sectors to steel, cement, and aluminum, and some chemicals is likely enough to tackle the bulk of carbon leakage.[152]

Another important factor to take account of is the administrative burden that follows the covered products.[153] If the border measures cover too many products, it would be very difficult for the administration authorities to check carbon footprint of each product. Thus, the more products subjected to a border measure, the higher the administrative burden will be for agencies responsible for implementing and supervising the measure.[154]

Therefore, on one hand, the inclusion of high-carbon finished products would contribute to better achieving the environmental goal of reducing carbon emissions and preventing carbon leakage. On the other hand, retracing carbon footprint in finished goods is highly challenging, especially when inputs might come from different countries of origin using different technologies. Furthermore, the origin of the components might be easily obscured by using importing-reexporting schemes.[155] Notably, both the US Lieberman-Warner Bill of 2008 and the Waxman-Markey Bill of 2009 exclude finished products from the border measures.[156]

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[152] Susanne Droge, supranote 15.

[153] See Sofia Persson, supranote 2, ("If the implementing country opts for the solution with standardized charges, the government would need to define benchmarks for all products covered by the scheme, possibly on a country level. To set these benchmarks, the implementing country would need to gather large amounts of information on greenhouse gas emissions and production methods from domestic and/or foreign producers. The implementing country must also put in place a system for controls at the border. Costs for border authorities are driven up under a [border carbon adjustment ("BCA")] for several reasons, such as if manual intervention is required to clear consignments at the border crossing, electronic submissions are not possible, large resources have to be devoted to prevent evasions, the BCA covers a large range of products, and if many companies are given individual treatment. Costs may also be driven up if the BCA results in a need for major IT development to deal with new processes. For the exporting country's authorities there can also be costs from a BCA. For instance, if an exporting country needs to put in place a scheme for rebates on exports or if the country's agency is responsible for the accreditation of the carbon footprint calculation, the result would be increased costs for border authorities.")

[154] Peter R. Orszag, supranote 41.

[155] Id.

[156] Here, a distinction between "finished product" and "manufacture/processed product" must be made. This paper use the term "finished product" to indicate the very final products that are sold to the consumer for purposes other than manufacture of other products. While certain "manufactured products" are also

Apart from the above considerations, the border measures must also respect the national treatment principle under WTO law, which requires treating all imported and domestic like products equally. According to WTO case law, the likeness among products must assessed on a case-by-case basis, using the following criteria:

(i) the physical properties of the products;
(ii) the extent to which the products are capable of serving in the same or similar end-uses;
(iii) the extent to which consumers perceive and treat the products as alternative means of performing particular functions in order to satisfy a particular need;
(iv) the international classification of the products for tariff purposes.[157]

An important question in relation to the application of the above four criteria to carbon border measures is whether the products may be considered "unlike" because of differences in the way in which they have been produced, i.e. the carbon emissions imputed to their production. An application by analogy of the 1987 GATT Panel report in the *US – Superfund* dispute may shed some light on this issue. In this dispute, the US introduced a tax on certain chemicals and applied this tax also to imports that had used the same chemicals as materials in the manufacture or production of these imports. This measure was found to be consistent with WTO rules on National Treatment (GATT Article III:2) by the competent WTO Panel. In particular, the distinction made by the tax between a product produced with the chemicals and a product not produced with the chemicals is presumed by the Panel. If this approach is applied in the case of a carbon tax, the distinction made by a carbon tax between high-carbon and low-carbon products (e.g. steel made with coal and steel made with natural gas) could be similarly taken for granted so that it could at least be presumed that these

considered as "primary products" because they are sold for purposes of further manufacture. Indeed, the Lieberman-Warner Bill of 2008 (version submitted to the Congress) only covers goods which are primary product. It defines "primary product" as: (A) iron, steel, aluminum, cement, bulk glass, or paper; or (B) any other manufactured product that -- (i) is sold in bulk for purposes of further manufacture; and (ii) generates, in the course of the manufacture of the product, direct greenhouse gas emissions and indirect greenhouse gas emissions that are comparable (on an emissions-per-dollar basis) to emissions generated in the manufacture of products by covered facilities in the industrial sector.

[157] European Communities — Measures Affecting Asbestos and Products Containing Asbestos, WT/DS135/AB/R (Appellate Body Report), para. 101-102.

different types of products are not like.[158] As a result, different treatment between imported and domestic products based on their carbon footprint could likely not violate WTO national treatment obligation under GATT Art. III. In the alternative, even if the products are like despite their different carbon footprint, the discrimination based on the carbon emission embedded in the products would likely be justifiable by the environmental exception under GATT Article XX(g).

In sum, including too many products into the scope of border measures would be highly challenging in terms of administrative feasibility of the carbon regulation. In contrast, excluding all finished products from the scope of border measures would undermine the environmental and competitive effectiveness of the carbon regulation. Another conclusion is that differentiation among products based on their carbon footprint is arguably WTO-compatible be it under GATT Article III national treatment itself, or justified under GATT Article XX environmental exceptions. However, the methods used to determining the carbon footprint in the final products that cross the borders may involve other practical and WTO implications. These problems will be discussed in the next section.

e) Calculating the Carbon Footprint

Here, it is also imperative that the carbon-regulating country defines its own rules for calculating carbon emissions of a product because different countries could choose different methods. As a result, "[a] producer exporting to these two markets would then have to do different calculations and this could potentially create trade barriers, increased costs, and less predictability."[159]

As previously discussed in Section I, sub-section C., from an environmental policy standpoint, taking into account of both direct and indirect emissions value on goods is arguably the most effective approach although it may pose some practical challenges for the administration of border measure.

As for calculating an adjustment base, there are often three suggestions as below:

[158] Pauwelyn, supranote 6.
[159] Sofia Persson, supranote 2.

1. *base on level of carbon emissions during the production of each product*;[160]
2. *by setting a standardized charge based on the average carbon footprint of the relevant industrial sector (e.g. steel in China, in US or worldwide) for each product category, regardless of how "green" its production process had been;*[161]
3. *by setting a standardized charge for each product category, but also to allow for producers in exporting countries to prove that they are more efficient to pay a lower tariff.*[162]

In all of the above scenarios, the carbon embodied in the products must be calculated in order to define the exact level of border adjustment on import. Depending on each option that the regulating country adopts, the burden of calculation is shifted either on the importers (option 1) or the importing country (option 2) or shared between the two (option 3). Below is an analysis of the pros and cons of each approach:

*If the burden of calculation is on the **importers***, they may be required to submit an *emission certification* or *carbon labeling* as to the relevant aspects of the productions process used. The carbon tariff, or level of emission allowance, would then be adjusted based on this calculation of carbon footprint.[163] But this may lead to some other practical problems, such as: small importers must bear high compliance cost for calculation of carbon footprint, or certain producers may not be willing to share confidential information on the composition of their products.[164] From the WTO standpoint, this method is most likely to be compatible with WTO law because the differentiation is based on the actual carbon footprint of each product and is not connected with its country of origin. However, the adoption of this method by the US could lead to the highest level of trade restriction as a large portion of US's imports come from countries with lower carbon standard like China.

[160] Id.
[161] Id.
[162] Id.
[163] Id.
[164] For description of implementation at level of best available technology and discussion of WTO compatibility see R. Ismer and K. Neuhoff, "Border Tax Adjustments: A feasible way to support stringent emissions trading," *European Journal of Law and Economics*, 2007, p. 137–164; and Olivier Godard, "Unilateral European Post-Kyoto climate policy and economic adjustment at EU borders," *EDF – Ecole Polytechnique Cahier n° DDX 07-15*, 2007.

*If the burden of calculation is on the **importing country***, they may have several options in calculating the carbon footprint as below:

- *Using the average emissions per sector in the exporting country for every product covered by the border measure*. But this value could be difficult to compute, especially if the country is reluctant to participate.[165] It could also be found WTO-inconsistent because it will lead to discrimination based on the country of origin of the product. Meanwhile, the regulating country could arguably invoke the environmental exception in GATT Article XX(g) to justify this discrimination.
- *Assuming that the imported products has been made according to the "best available technology" ("BAT")[166] currently available and to tax the product accordingly.[167]* In case that the importer does not report voluntary information certified the carbon content of their products, this method would be more feasible. Furthermore, this approach would be likely WTO-compatible because it treats domestic and foreign producers equally. But in many cases, the BAT entails almost zero emissions, such as steel made with sustainable charcoal in Brazil or of aluminum made with hydropower in Canada.[168] Thus it would lead to a very low tax on imports and therefore not effective in both environmental and competitive terms. Monjon and Quirion suggest that the product-specific benchmarks, which are currently being built by the EU for the goods produced by sectors that are covered by the distribution of free allowances, could be a good candidate to define the amount of emissions that would be imputed to imports.[169] However, these benchmarks only cover direct emissions, so if the border measure tends to also cover indirect emissions, a different approach must apply for these indirect emissions.[170]
- *Using the average emissions per sector in the regulating country for every product covered by the border measure*. Similar to the BAT approach, this approach would be likely WTO-compatible because it treats domestic and foreign producers equally.[171]

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[165] Sofia Persson, supranote 2.

[166] Sometimes they are also referred to as the "predominant methodology of production" in the regulating country. See, for example, Olivier Godard, supranote 164.

[167] Demaret, P. and R. Stewardson, "Border tax adjustments under GATT and EC law and general implications for environmental taxes" Journal of World Trade, vol.28, No.4, 1994, pp.5-65.

[168] Monjon and Quirion, supranote 14.

[169] Id.

[170] Id.

[171] This default rate approach has been applied in the *US – Superfund Act* for the tax on imports produced with certain chemicals and has not been rejected by the GATT panel in charge of the dispute relating to this legislation. See *United States - Taxes on*

It should be noted that the use of an standardized charge, regardless of their method of calculation, may not be effective in terms of domestic competitiveness because in most sectors, the average importer would pay less per ton of CO2 actually emitted than the average domestic producer.[172] Furthermore, it is not environmentally effective neither because it does not incentivize producers to improve their production methods.

It results from the above discussion that the most preferable approach in terms of both WTO-compliance, administration feasibility, environmental effectiveness and domestic competitiveness is setting a standardized charge for each product category based on the average emissions per sector in the regulating country or in the exporting country, and at the same time giving the producers the possibility to prove that their products is more environmentally efficient in order to be subject to a lower tariff.

f) Applicable Parties

Who is covered by the border measure can undoubtedly create a number of challenges in terms of both WTO compliance, administrative feasibility, environmental and competitive effectiveness of the carbon regulation. As non-discrimination among trade partners is a core principle of WTO law, imposing the border measures on imports from all countries seems intuitive and the easiest approach. However, as previously discussed in Section I., sub-section D., this approach is too simplistic and could trigger strong opposition, as it is environmentally and economically counter-productive: it ignores (i) comparable carbon policies in other countries and (ii) the economical capacity of certain countries, especially the least developed countries, to comply with the said border measures. In addition, a *de facto* "less favourable treatment", which is also prohibited under GATT Article I (Most-Favoured-Nation Treatment) and III (National Treatment), may be resulted from imposing border measures on imports originating from countries that already have a comparable carbon policies (especially a carbon price-based measure) in place.

Petroleum and certain imported substances (short title: US-Superfund Act), L/6175 - 34S/136 (Panel Report).

[172] Monjon and Quirion, supranote 14.

Therefore, differentiating is necessary to ensure the effectiveness of the carbon reduction policies as a whole. Indeed, the carbon pricing regimes that have been discussed in earlier chapters have taken this approach in implementing their border measures.[173] However, two questions could be raised relating to such differentiation:

(i) It must be based on what criteria? Economic, environmental, or both?

(ii) Could it be justified by the environmental exception under GATT Article XX(g)?

The answers to these questions will be analyzed as follow:

First, excluding the least developed countries from the list of applicable parties could likely be environmentally counter-productive as production will shift from countries with no-carbon pricing and high emissions level such as China to least developed countries in order to take advantage of such exemption. Furthermore, environmentally speaking, both advanced developing countries such as China or India and least developed nations don't have any comprehensive carbon pricing policies in place. It is thus uncertain whether such differentiation could be justified under the exception of GATT Article XX (g) as although it does take into account the local conditions in foreign countries, it is concerned with the level of economic development and not environmental protection. If one takes into account the environmental protection criteria, the measure could therefore constitute a discrimination "*between countries where the same conditions prevail*" and may not be saved by GATT Article XX (g).[174]

[173] See, for example, the CSA 2009, the ACESA 2008 and the EU Directive 2008/101/EC.

[174] In *Brazil - Measures Affecting Imports of Retreaded Tyres* , WT/DS332/AB/R (Appellate Body Report), the Appellate Body ruled that "there is arbitrary or unjustifiable discrimination, within the meaning of the chapeau of Article XX, when a Member seeks to justify the discrimination resulting from the application of its measure by a rationale that bears no relationship to the accomplishment of the objective that falls within the purview of one of the paragraphs of Article XX, or goes against this objective" [emphasis added]. Thus, in the present case, discrimination based on economic criteria would hardly be considered to be connected with the environmental protection objective of a carbon border measure.

Second, the US's approach of "minimis percentage" of emissions under the Liberman-Warner Bill of 2008[175] could be justified both in terms of effectiveness of the allowance requirement provision and the environmental goal of the policy for WTO purposes. Such environmental criteria would be more likely to satisfy the conditions of GATT Article XX (g) and the Chapeau of GATT. In contrast, the attempt of combining economic and environmental criteria may create more administrative challenges. For instance, the Waxman-Markey Bill of 2009 carves out countries emitting less than 0.5% of global greenhouse gas emissions and less than 5% of US imports of covered goods. This may lead to a lack of transparency for both exporters and importers, i.e. a country could suddenly become a part of a Border Measure if their imports to the US increased or if their percentage share increased due to a decrease in imports from other countries.

Third, for WTO purposes, as reflected in the Lieberman-Warner Bill of 2008, whenever the determination of "comparable action" is deemed inadequate, the measure could be adjusted to better enhance its effectiveness.[176] It is noteworthy that such determination of "comparable action" must be based on the effectiveness of the regulations. In other words, foreign regulations do not need to be "essentially the same" in comparison with the domestic regulation in order to be deemed as "comparable".[177] Therefore, this approach would arguably provide a mechanism to ensure the "basic fairness and due process" to meet the conditions in GATT Art. XX (g).[178] Moreover, U.S. carbon legislation could stand a better chance to pass this test

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[175] The "International Reserve Allowances Program" established by under the ACESA 2008 excludes from its scope countries whose respective share of total global greenhouse gas emissions is below the de minimis percentage of 0.5%.

[176] Section 6007 of the CSA 2009.

[177] The Appellate Body's findings in *United States - Import Prohibition of Certain Shrimp and Shrimp Product (Implementation under Article 21.5)* provides a strong support for this approach. Indeed, the Appellate Body accepted the US reformed border measure excluding foreign countries having regulatory programmes that are "comparable in effectiveness".

[178] *United States - Import Prohibition of Certain Shrimp and Shrimp Product (Implementation under Article 21.5)*, WT/DS58/AB/RW (Appellate Body Report), para. 141 ("a measure requiring United States and foreign regulatory programmes to be "comparable in effectiveness", as opposed to being "essentially the same", would, absent some other shortcoming, comply with the chapeau of Article XX." – para. 141 of the report).

if a review or appeal process is available for the applicable parties. The EU-ETS has already proceeded with this notion when crafting its aviation directive.[179]

As summarized in Annex 3, the above discussion shows that differentiation is necessary and must be based on a clear and objective environmental criteria, otherwise it risks becoming arbitrary and unjustifiable under the exceptions provided by GATT Art. XX (g).

IV. A Proposal for the United States

A. Specificities of this Proposal

In light of all of the above, our recommended linkage proposal shall comprise of Border Measures. Border Measures are the most viable option because it accounts for those countries that will not, or cannot practically, join the "pool." Further, granting free allowances to effected domestic companies is counterproductive and contrary to the spirit and goals of a GHG scheme. Moreover, free allowances should not be coupled with a Border Measure as "combining a [border adjustment] with free allocation would mean either that foreign producers would be unduly advantaged, which the WTO would reject . . . ."[180] Additionally, with a border adjustment, the U.S. would not suffer from a competitive disadvantage (or much less so), and therefore there is little rationale for free allocation, which causes economic distortions. [181] Moreover:

> [A Border Measure] has the advantage of generating public receipts, which may be redistributed to exporting countries. The latter would then probably be less likely to interpret the [Border Measure] as a

[179] Para. 18 of the Directive 2008/101/EC provides that if a third country adopts measures to be deemed equivalent to EU's measures, the EU "shall consider options available in order to provide for optimal interaction between the Community scheme and that country's measures", "after ***consulting*** with that third country" [emphasis added]. However, the Directive does not clarify what constitutes an equivalent measure for reducing the climate change impact of flights. Hence, although the Directive does not explicitly require other countries to adopt the same carbon reduction regime as the EU, the lack of clarity in its text could make it harder to pass the discrimination test under the Chapeau of GATT Art. XX, even if the discriminatory measure is justifiable under the GATT Art. XX(g) exception. For a detailed analysis on the WTO compatibility of this Directive, see, for example, Joshua Meltzer, supranote 72.

[180] Monjon and Quirion, supranote 14, at 2.

[181] Id.

> protectionist policy if the revenue coming from the importations are used for instance to finance some projects of mitigation and/or adaptation in the developing countries."[182]

Conveniently, the Border Measure can work regardless of whether the U.S. adopts a carbon tax system or a cap-and-trade. As previously discussed, a Border Measure could apply to imports, exports, or both.

If the US adopts a carbon tax system, the adjustment could take the form of either (i) a tax on applicable imported products, *and/or* (ii) a tax exemption on applicable exported products.[183] If the US is more concerned with the objective of limiting competition distortions within the U.S. between US producers and foreign producers from countries that have no climate action or action that is not comparable to the U.S, it could choose to limit the scope of the Border Measure only on imports.[184] Additionally, if the US is also concerned with the objective of leveling the playing field between US producers and foreign producers in the world market, it could extend the scope of the Border Measure to exports. However, it should be noted that a full tax exemption on exports could lead to a counter-productive effect from the environmental perspective because domestic producers would be less incentivized to reduce CO2 emissions resulting from the manufacture of exported goods from the US. Consequently, the impact of a border measure on exports on world CO2 emissions cannot be know with certainty, which poses a difficulty to invoke the environmental exception under GATT Article XX(g).

If the U.S. adopts a cap-and-trade program, the Border Measure could (i) require importers to surrender emission allowances on imports, *and/or* (ii) apply a rebate of emissions allowances on exports. The analysis in the paragraph above also applies for the consideration of whether to extend the scope of the Border Measure to exports. Alternatively, instead of a border measure on export, the US, through a commission of expertise, may decide whether it is better to implement a program of distribution of free allowances for the sectors that are most exposed to

[182] Id.
[183] See Monjon and Quirion, supranote 14, at 3.
[184] See Monjon and Quirion, supranote 14, at 3 (applying a similar analysis for the European markets).

the risk of carbon leakage.[185] Meanwhile, it should also be noted that if the free emissions allowances received by the affected sectors exceed the total amount of their real emissions, this measure would constitute a prohibited subsidy under the WTO SCM Agreement. At the same time, it could jeopardize the environmental effectiveness of the entire carbon reduction legislation.

As discussed in previous chapters of this paper, the questions of what to do with goods at the border becomes highly technical but often comes down to addressing four overarching key issues: (1) Triggering the Competition Provision; (2) Targeted Products and Industries; (3) Calculating the Carbon Footprint Using An Adjustment Base For Direct and Indirect Emissions and; (4) the Applicable Parties. A table illustrating a range of various options for each of the above issues under four criteria: (1) WTO compliance; (2) Administrative feasibility; (3) Environmental effectiveness and (4) Domestic competitiveness is included in the Annexes of this paper.

This paper recommends the following optimal solution for the design of the US's border measures:

- **Triggering the Competition Provision:** A flexible date of implementation upon the discretion of the Executive is more preferable.
- **Applicable Parties:** the border measure should carve out (i) countries with "comparable action" in reducing CO2 emissions (based on concreted emissions percentage criteria); and (ii) countries whose share of global GHGs emissions is below a "minimis percentage" (for example, 0.5% as suggested in the Lieberman-Warner Bill of 2008).
- **Targeted Goods and Industries:** the border measures should cover (i) raw materials produced by sectors with high carbon intensity (criteria for such sectors are to be further developed by the government); and (ii) finished products that utilize a certain percentage of the covered raw materials (such percentage is set by the government).
- **Calculating Carbon Footprint:** The border measure should be based on a standardized charge for each product category and the carbon footprint must be calculated by using the average emissions per sector in the

[185] As previously discussed in Section II, this is the current approach of the competition policy taken by the EU and Australia.

regulating country or in the exporting country. At the same time, it should give the producers the possibility to prove that their products are more environmentally efficient in order to be subject to a lower tariff.

B. Implementation Planning

Implementation of the carbon reduction and linkage policies would likely fit best under the umbrella of the Environmental Protection Agency (EPA) given its authority to regulate carbon emissions. In fact, the EPA declared on April 17, 2009 that six greenhouse gases, including CO2 are a danger to the environment and to human health.[186] While the EPA's ability to control carbon reduction policies is being challenged, it's authority in this domain seems settled after the major 2007 Supreme Court case, *Massachusetts, et al. v. Environmental Protection Agency et al.*, 549 U.S. 497 (2007).

In that case, States, local governments, and environmental organizations petitioned for review of an order of the EPA denying a petition for rulemaking to regulate greenhouse gas emissions from motor vehicles under the Clean Air Act. The Court ruled that the Clean Air Act permits the EPA to issue regulations for air pollutants that they determine "endanger public health and welfare."[187] Further, the EPA could not avoid taking regulatory action under the Clean Air Act with respect to greenhouse gas emissions from new motor vehicles based on policy judgments that a number of voluntary executive branch programs already provide an effective response to the threat of global warming; that regulating greenhouse gases might impair the President's ability to negotiate with "key developing nations" to reduce emissions; and that curtailing motor-vehicle emissions would reflect "an inefficient, piecemeal approach to address the climate change issue."[188]

Since that case, the EPA has proposed regulations that would in fact seek to limit carbon dioxide. However, in four pending lawsuits in the D.C. Circuit, these regulations are being challenged as erroneous due to lacking scientific evidence that GHG pose a significant risk to human health. Nonetheless, the result of the Massachusetts case gives the EPA "a major role in regulating CO2 emissions and

[186] Susanne Droge, supranote 15.
[187] Massachusetts, et al. v. Environmental Protection Agency et al., 549 U.S. 497, at VII.
[188] Id.

increases the pressure to find a compromise on cap and trade for those who fear a strict regulatory approach." For this reason, it is the regulatory branch that seems most suitable for implementing the domestic carbon reduction policy and linking it with the global markets.

V. Conclusion

In conclusion, we do not think it is realistic for the U.S. to anticipate a universally harmonizing carbon reduction scheme. Nevertheless, the U.S. can likely link with other carbon reduction systems in a fashion that seeks to: (1) protect trade competitiveness; (2) consider the globally fragmented carbon policy (carbon tax, cap & trade, and non- regulation); and (3) remain compliant with WTO Law. In particular, we recommend implementing U.S. border measures pursuant to the guidelines suggested above. The driving forces behind each consideration shall be: WTO compliance, administrative feasibility, environmental effectiveness, and domestic competitiveness. Indeed, all of these considerations must be weighed and balanced when crafting linkage and competition provisions in any potential federally mandated carbon reduction policy in the United States.

VI. Annexes

A. Table 1: Current Carbon Reduction Policies in Top 25 Emitting Countries[189]

Countries	Carbon tax	Cap-and-trade	Non-carbon price based policies	Most relevant legislations	Notes
US			•	- American Recovery and Reinvestment Act (2009) - Food, Conservation, and Energy Act (2008) - Energy Independence and Security Act (2007)	Despite the absence of a federal legislation, state cap-and-trade systems are implemented in California and New Mexico. Current carbon reduction measures under relevant legislations (hereinafter, current CRMs): energy efficiency, renewable energy.
China			•	- National Climate Change Programme (NCCP) (2007) - 12th National Five-Years Plan (2011-2015)	Pilot ETS programme for Beijing, Tianjin, Shanghai, Chongqing, Shenzhen, Hubei and Guangdong. Current CRMs: energy efficiency, renewable energy, forestry, land use, transport.
EU		•	•	The 2009 Climate and Energy Package composes of: - Directive 2009/29/EC (emissions trading schemes) - Decision 406/2009/EC (Effort Sharing Decision, aims to reduce GHGs emissions from sectors not included in the EU ETS such as transport, buildings, agriculture and waste) - Directive 2009/28/EC (promotion of the use of renewable energy) - Directive 2009/31/EC (carbon capture and storage).	EU ETS now operates in 30 countries (the 27 EU Member States plus Iceland, Liechtenstein and Norway). Switzerland is also planning to link its ETS with EU. Current CRMs: carbon emissions trading, energy efficiency, renewable energy, transports.
Russia			•	- Climate Doctrine of the Russian Federation (2009) - Energy Efficiency legislation (2009) - Decree No. 843 (2009) on carbon offsets projects under the Kyoto Protocol Joint Implementation mechanism	Current CRMs: energy efficiency, renewable energy, forestry, carbon offsets trading.

[189] Classification by the World Resources Institute - http://www.wri.org- as of 2005.

India	•		•	- National Action Plan on Climate Change (2008) - Post-Copenhagen announced domestic actions (follow up of the 2008 Climate Action Plan) (2010) - Ethanol Production incentives (2007)	The carbon tax only applies on coal – both domestic and imported, at the rate of Ruppies. 50 (~USD 1) per ton. Current CRMs: energy efficiency, renewable energy, forestry, land use, transport, carbon offsets trading.
Japan			•	- Law Concerning the Promotion of the Measures to Cope with Global Warming (2005) - Law Concerning the Rational Use of Energy (2010) - Law Concerning Special Measures for Promotion of New Energy Use (2002)	The Government is mandated to develop an ETS. Japan has also trialed 2 voluntary emissions trading scheme in 2005 and 2008. Current CRMs: energy efficiency, renewable energy, forestry, land use, transport, carbon trading.
Germany		•	•	Integrated Climate and Energy Programme (2007, 2008) Energy Concept for an Environmentally Sound, Reliable and Affordable Energy Supply (2010) Renewable Energy Sources Act (RESA) (2009)	Cap-and-trade system operated under the EU ETS. Current CRMs: carbon trading, energy efficiency, renewable energy, transport.
Brazil			•	National Policy on Climate Change (2009) Federal Law No. 9985/2000/, Federal Decree No. 4340/2001 – National System of Conservation Units (deforestation policies)	Mechanisms for carbon credits trading have been developed at the state level under the Kyoto Protocol CDM. Current CRMs: forestry, energy efficiency, renewable energy, land use, transport, carbon trading.
Canada			•	Kyoto Protocol Implementation Act (2007) Biofuel Bill C-33: An Act to amend the Canadian Environmental Protection Act (2008) Energy Efficiency Act (1992, amended in 2008)	Despite the absence of a federal legislation, a provincial cap-and-trade system is implemented in Quebec. Carbon tax legislation is also adopted in Quebec, British Columbia and Alberta. Current CRMs: energy efficiency, forestry, land use, transport.
UK	•	•	•	Climate Change Act (2008) Carbon Reduction Commitment Energy Efficiency Scheme (2010) Feed-in Tariffs for renewable electricity (2010) Climate change levy (2001)	Cap-and-trade system operated under the EU ETS. The carbon tax only applies to energy use (electricity, gas, solid fuel and liquefied gases) in business and public sectors. Current CRMs: energy efficiency; renewable

					energy.
Italy		•	•	- Climate Change Action Plan (2007) - Strategy to Cut National Greenhouse Gas Emissions (2002)	Cap-and-trade system operated under the EU ETS. Current CRMs: carbon emissions trading, energy efficiency, renewable energy, forestry, land use, transport.
South Korea			•	Framework Act on Low Carbon Green Growth (2009) The Enforcement Decree of the Framework Act on Low Carbon Green Growth (2010)	The Government is mandated to prepare strategy and legislative framework for a future ETS. Current CRMs: energy efficiency, renewable energy, forestry, land use, transport.
France		•	•	- Framework Law for the implementation of the "Grenelle de l'environnement" (Law Grenelle 1) (2009) - Law Grenelle 2 (2010)	Cap-and-trade system operating under the EU ETS. Current CRMs: carbon emissions trading, energy efficiency, renewable energy, transports.
Mexico			•	- Law for the Use of Renewable Energies and for the Finance of the Energy Transition (2008) - Law for Sustainable Energy Use (2008) - Law for Bioenergy Promotion and Development (2007) - Inter-Secretariat Commission on Climate Change (2005)	Pilot ETS could be launched by the end of 2012. Mechanisms for carbon credits trading have been developed at the state level under the Kyoto Protocol CDM. Current CRMs: renewable energy, energy efficiency, forestry, land use, carbon credits trading.
Indonesia			•	- Presidential Regulation on the National Council for Climate Change (NCCC) (2008) - Presidential Instruction No. 1/2006 on Biofuel Development (2006)	Mechanism and procedure for carbon credits trading is regulated by the NCCC. Current CRMs: forestry, renewable energy.
Australia	•		•	Clean Energy Legislative package (2012) composes of: - Clean Energy Act 2011 - Clean Energy Regulator Act 2011 - Climate Change Authority Act 2011 - Clean Energy (Consequential Amendments) Act 2011 - and other acts dealing with charges under the carbon pricing mechanism.	Australia will shift to cap-and-trade after 2015. Current CRMs: carbon pricing mechanisms, renewable energy, energy efficiency, forestry, land use, transport.
Ukraine			•	- Energy Strategy of Ukraine for period till 2030 (Resolution of the Cabinet of Ministers of Ukraine No.145-p on March 15,2006) - Resolution of the Cabinet of	Current CRMs: energy efficiency, renewable energy, carbon offsets trading.

				Ministers of Ukraine No. 206 (2006) to implement the Kyoto Protocol's JI mechanism.	
Iran			•	- Environmental Protection and Enhancement Act (1974) - Air Pollution Emissions Standards (1998) - Law on exploitation and protection of forestry and rangelands (1967, amended in 1975 and 1997)	Iran's climate change policy operates mainly on government decisions and policies. Several carbon credits projects are currently operating under the Kyoto Protocol's CDM. Current CRMs: energy efficiency, renewable energy, forestry.
South Africa			•	- Vision, Strategic Direction and Framework for Climate Policy (2008) - Taxation Laws Amendment Bill (2009) - National Energy Act, 2008	The Treasury is charged with studying the implementation of a carbon tax. Several carbon credits projects are currently operating under the Kyoto Protocol's CDM. Current CRMs: renewable energy, energy efficiency, transport, carbon credits trading.
Spain		•	•	- Law 13/2010 amending Law 1/2005 (Regulation of trade of greenhouse gas emission allowances) - Spanish Strategy of Climate Change and Clean Energy (2001-2012) - Gas and Electricity Planification (2008-2016) - Spanish Forestry Plan (2002-2032)	Cap-and-trade system operated under the EU ETS. Active participation in Kyoto Protocol's CDM and Green Investment Schemes. Current CRMs: carbon credits, trading, energy efficiency, renewable energy, forestry.
Poland		•	•	- Environmental Protection Law (2001) - Polish energy policy until 2030	Cap-and-trade system operated under the EU ETS. Current CRMs: carbon emissions trading, energy efficiency, renewable energy.
Turkey			•	- Support Scheme for Energy Efficiency in Industry (2008) - Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (2005) - Energy Efficiency Law (2007) - Labeling of Passenger Car Fuel Economy and CO2 Emissions (2003)	Turkey is exploring the establishment of a domestic carbon market as a tool for facilitating crediting and carbon finance from developed countries. Current CRMs: energy efficiency, renewable energy.
Saudi Arabia			•	Royal Decree of 17/04/2010 on the King Abdullah City for Atomic and Renewable Energies (2010)	Highly dependent on the export of fossil fuels, Saudi Arabia has been slow to reduce CO2 emissions. Current CRMs: energy

					efficiency, renewable energy.
Argentina			•	- Renewable Energy Generation Program (2010) Biofuels Promotion Laws (2007) - Argentine Carbon Fund (Decree 1070/05) - Program of Rational Use of Energy (Resolution 415/04) - National Plan for Wind Power	Several carbon credits projects are operating under the Kyoto Protocol's CDM. Current CRMs: energy efficiency, renewable energy, carbon credits trading.
Pakistan			•	National Climate Change Policy (2012)	Current CRMs: energy efficiency, renewable energy.

The table was developed to complement the analysis in Section II. International Carbon Reduction Policies and shed a view on the complex picture of carbon reduction regimes in different countries in the world today. In particular, it shows a summarized view on the current carbon policies in Top 25 GHGs emitting countries (classification by the World Resources Institute - www.wri.org - as of 2005) in a descending order. As our primary subject of discussion is carbon-pricing mechanisms, we divide the current carbon reduction policies into 3 sub-categories: (i) carbon tax; (ii) cap-and-trade and (iii) non-carbon price based policies. The third category regroups all carbon reduction measures other than carbon pricing, such as: forestry preservation and forestation, sustainable land use, promotion of the use of renewable energy (e.g. feed-in tariffs, subsidies or tax breaks), measures to enhance energy efficiency in manufacture and transports (e.g. vehicle emissions standards, fuel standards, carbon labeling) and operation of carbon credits projects. The fifth column lists out the most relevant national legislations relating to this subject. The last column provides additional information highlighting the carbon pricing mechanisms that are already in place or under development, and a brief list of current carbon reduction policies (in all 3 sub-categories) that are provided by the relevant legislations.

B. Table 2: Types of Border Measures and their WTO Consistency[190]

Border measures that would likely be INCONSISTENT	**Relevant WTO provisions**	
Import ban on carbon-intensive products from carbon-unregulated countries	GATT Art. XI:1 (prohibition of quantitative restrictions)	**MAY be justified under the GATT Art. XX(g)**
Punitive tariffs imports from carbon-unregulated countries	GATT Art. I (MFN treatment) GATT Art. II:1(b) (Schedule of Concessions)	
Anti-dumping duty on imports to offset the "subsidy" of not imposing carbon restrictions by carbon-unregulated countries	Anti-Dumping Agreement	**MAY NOT be justified under GATT Art. XX(g)**
Countervailing duties on imports to offset the "subsidy" of not imposing carbon restrictions by carbon-unregulated countries	Subsidies and Countervailing Measures Agreement	
Border measures that would likely be CONSISTENT	**Relevant WTO provisions**	
Tax on imported carbon-intensive products	GATT Art. I (MFN treatment) GATT Article II:2(a) ("a charge equivalent to an internal tax", National treatment) GATT Art. III:2 ("internal tax or charge", National treatment)	**MAY be justified under GATT Art. XX(g) <u>if discriminates</u> among like products based on their origin.**
Importation requirement to importers to surrender allowances for emissions	GATT Article II:2(a) ("a charge equivalent to an internal tax") or GATT Article III:4 (regulation "affecting the internal sale of the products")	
CO2 tax on international transportation	GATT Art. I (MFN treatment) GATT Article II:2(a) ("a charge equivalent to an internal tax" , National treatment) GATT Art. III:2 ("internal tax or charge", National treatment)	
Imposing regulation standards in relation to the carbon emitted by the imported products	GATT Article III:4 (regulation "affecting the internal sale of the products")	
Tax exemption on carbon-intensive exported products	Subsidies and Countervailing Measures Agreement	**COULD NOT be regarded as a prohibited export subsidy under the SCM Agreement**
Rebate on emission allowances for exporters	Subsidies and Countervailing Measures Agreement	

[190] This table is a summary of the main findings in Joost Pauwelyn, "Carbon Leakage Measures and Border Tax Adjustments under WTO Law," in *Research Handbook on Environment, Health and the WTO (forthcoming)*, ed. Geert van Calster and Denise Prévost (Edward Elgar, UK, 2012).

C. Table 3: Design Options for the U.S.'s Border Measures

N.B.: The highlighted rows are the recommended options.

Triggering the Competition Provision				
Options	**WTO compliance**	**Administrative feasibility**	**Environmental effectiveness**	**Domestic competitiveness**
1. Strict deadline & quantitative limits	Mandatory legislation could be challenged beforehand	Would be low if the BMs have immediate effect or will take effect after a relatively short period	Would be high if the BMs have immediate effect or will take effect after a relatively short period	Would be high if the BMs have immediate effect or will take effect after a relatively short period
2. Flexibility & discretion to the Executive	Discretionary legislation could not be challenged, unless the discretion is contrary to WTO law	High	Would be low if the BMs take effect after a relatively long period	Medium (because the time and scope of the protection resulted from the BMs are subject to the Executive's discretion)
Applicable Parties				
Options	**WTO compliance**	**Administrative feasibility**	**Environmental effectiveness**	**Domestic competitiveness**
1. All countries are covered	Low	High	Low	High
2. Countries taking *"comparable action"* are carved out	High	Low	High	Medium[191]
3. Least Developed Countries are carved out	Medium	High	Low	Medium
4. Countries whose share of global GHGs emissions is below a "minimis percentage" are carved out	High	High	High	Medium[192]

[191] But in fact it would have little impact on domestic competitiveness because imports from countries with a "comparable action" may also bear a carbon cost in their home countries.

[192] In fact, it would have little impact on domestic competitiveness because the share of global GHGs emissions would be, in this case, arguably proportionate with

Targeted Goods and Industries				
Options	**WTO compliance**	**Administrative feasibility**	**Environmental effectiveness**	**Domestic competitiveness**
1. All goods with a carbon footprint	High	Low	High	High
2. Carbon-intensive raw materials from sectors that are susceptible to carbon leakage	High	High	Low	Low
3. Option (2) PLUS finished products with a certain percentage of a covered raw material(s)	High	Medium	Medium	Medium
Calculating Adjustment Base and Carbon Footprint				
Options	**WTO compliance**	**Administrative feasibility**	**Environmental effectiveness**	**Domestic competitiveness**
1. Actual Carbon Footprint in every product	High	Low	High	High
2. Standardized charge ("SC") using Best Available Technology	High	High	Low	Low
3. SC using industry average of the exporting countries	High	Medium	Low	Low
4. SC using US's industry average	High	High	Low	Medium
5. Option (3) OR (4) PLUS Producers can prove that their products are more environmental friendly	High	Medium	High	Medium

the quantity of targeted carbon-intensive products imported into the domestic market.

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