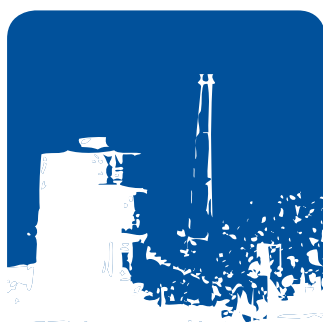


# Climate measures and trade

Legal and economic aspects of border carbon adjustment.



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# Executive Summary

Border carbon adjustment has been frequently discussed in a number of political and legislative fora in both the US and the EU. Three arguments are usually referred to for motivating border carbon adjustment: to level the playing field, to avoid carbon leakage and to create incentives for major emitters to take on commitments in the negotiations over a post-2012 climate regime.

This study focuses on the legal and economic aspects of a border carbon tax or a carbon regulation requiring participation in a domestic cap-and-trade system, referring to both as border carbon adjustment. It examines what literature has to say about the legal implications and looks into the arguments given for introducing border carbon adjustments.

If border carbon adjustment measures are introduced, it seems unlikely that they will improve the chances of reaching a global climate deal. However, the measures may address some concerns related to carbon leakage and competitiveness.

The legal compatibility of border carbon adjustment with WTO rules is uncertain and, if introduced, it is likely that a dispute panel will decide about the legality.

The design of border carbon adjustment will be an important factor both in regard to effectiveness and legality.

A border carbon adjustment scheme would be extremely complex to administer.

# Abbreviations and Terms

**Annex I countries:** Industrialized and transition countries listed in Annex I to the UNFCCC including all EU/EES member states, Australia, Belarus, Canada, Japan, New Zealand, Russia, Switzerland, Turkey, Ukraine, and the United States.

**Bali Roadmap:** The United Nations Climate Change Conference in Bali culminated in the adoption of the Bali roadmap, which charts the course for a new negotiating process to be concluded by 2009 that will ultimately lead to a post-2012 international agreement on climate change.

**BCA:** Border carbon adjustment

**BTA:** Border tax adjustment

**Cap-and-trade:** A regulating entity sets a target level for greenhouse gas emissions (cap) and allows firms to buy and sell (trade) permits under this cap. The European Union's emission trading scheme is a cap-and-trade.

**CDM:** Clean Development Mechanism is one of the flexible mechanisms in the Kyoto Protocol.

**COP:** Conference of the Parties. Meetings of the highest body of the United Nations Climate Change Convention to discuss the convention's developments.

**Embedded carbon:** Carbon emissions associated with the production of a product through the entity of its supply chain.

**Emission leakage:** Any emissions abatement that occurs in one location but is offset by associated emissions growth in another.

**ETS:** The European Union's Emissions Trading Scheme launched in 2005.

**GHG:** Green House Gas. Carbon dioxide (CO<sub>2</sub>) is the most significant of these. The Kyoto Protocol covers six GHG.

**IPCC:** Intergovernmental Panel on Climate Change

**Kyoto Protocol:** International agreement adopted by Parties to the United Nations Framework Convention on Climate Change in Kyoto, Japan, in December 1997. Entered into force in 2005.

**MFN:** Most Favoured Nation

**Non-Annex I countries:** The countries that are not listed in Annex I of the UNFCCC, consisting primarily of developing countries.

**NPR-PPM:** Non product related production and process methods.

**NT:** National Treatment

**PPM:** Production and process methods

**QR:** Quantitative Restrictions

**UNFCCC:** United Nations Framework Convention on Climate Change. A treaty signed at the 1992 Earth Summit in Rio de Janeiro that nearly all countries of the world have joined. See <http://unfccc.int>

# 1. Introduction

## 1.1 Climate change

After decades of debating the evidence, scientists now agree that climate change is for real. It is caused by emissions of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and other greenhouse gases that accumulate in the atmosphere and trap the heat from the sun that otherwise would have radiated back into the space. The main culprit is the burning of fossil fuel that took off at the industrial revolution in the 18<sup>th</sup> century and accelerated after the Second World War. The emissions did not cause any problems as long as they stayed within the natural absorption capacity of the biosphere, including natural carbon sinks such as forests and the sea. The natural threshold was passed during the second industrial revolution in the 1950s and 1960s and current emissions may exceed the natural limit by as much as 80 percent. If nothing is done to curb the emissions, the global temperature will rise by at least 2 degrees and perhaps as much as 6 degrees before the end of the 21<sup>st</sup> century.

## 1.2 Climate negotiations and trade issues

The first international attempt to curb the emissions of greenhouse was the Kyoto Protocol, adopted on 11 December 1997. The Protocol entered into force on 16 February 2005 and has today 183 signatories. All major economies but the United States have ratified the protocol. The Kyoto Protocol sets binding targets for 37 industrialized countries for reducing greenhouse gas emissions. The target for the first five-year period 2008–2012 is a five percent reduction against 1990 levels.

Developing countries<sup>1</sup> are encouraged but not required to cut their own emissions. This is partly recognition of their modest contribution to the emissions in the past and partly recognition of their development needs.

The Kyoto Protocol will expire in 2012. Representatives of 187 countries agreed in December 2007, at the United Nations Climate Change Conference in Bali, on a roadmap which charts the course for a new negotiating process to be concluded by 2009 that will ultimately lead to a post-2012 international agreement on climate change. The "Bali Road Map" includes the Bali Action Plan which provides a basis for a comprehensive process for long-term cooperative action on climate

change, requiring action in several policy areas by using a range of policy instruments and measures. The Action Plan has even called for "enhanced action on adaptation", including consideration of "economic diversification to build resilience."

The economic dimension of climate regimes was also recognized and discussed at an informal meeting among trade ministers, parallel to the global climate negotiations in Bali. It was clear from these discussions, that the participants recognized the importance of trade rules for achieving climate change goals and saw the potential for positive outcomes if the policies relating to trade and climate change can be aligned and made mutually supportive. However, ministers also recognized that climate related issues should be first and foremost addressed through the UNFCCC process, and that the trade regime should at most be supporting to global efforts to address climate change.

## 1.3 The current discussion about border carbon adjustment

The idea of a carbon tax on imports was initially launched by the French parliament in a report on climate change in 2006.<sup>2</sup> The report addressed border tax adjustments on imports, as well as rebates on exports. However, more recently a change of focus can be noted, away from taxes towards a discussion on including importers into domestic cap-and-trade schemes. Given this fact, "border carbon adjustment" (BCA) is a useful term when referring to both carbon taxes and allowance requirements for carbon-intensive goods adjusted at the border. The question of legality and effectiveness of border carbon adjustments has been a frequently discussed issue in press, science and politics, addressed by both European and US institutions.<sup>3</sup>

There are several reasons why border carbon adjustments have become an issue in recent times:

First, there is an underlying problem that there can be free riders on international climate change agreements like the Kyoto Protocol and its successor, a post-2012 agreement. As long as the Convention and the Kyoto Protocol are not signed by all countries, parties taking on binding commitments to reduce the emissions of greenhouse gases (GHG) can be worried about free riding by non-parties, in that any given country could benefit from such an agreement without incurring the costs of participating in it.

Moreover, the concept of “common but differentiated responsibilities”, which is enshrined in the Convention, allows for countries to take on different levels of commitments, in accordance with their historical contributions to the problem of climate change and their ability to respond to it. In practice, this means that even if all countries would *sign* a post 2012-agreement, countries with relatively higher reduction commitments can still worry about distorting effects of varying levels of reduction commitments.

There are mainly two reasons why some countries worry about this situation. Firstly, there is a concern that the position of industries in countries with stringent reduction commitments risks to become undermined in the international competition with industries in non-participating countries or in countries with lower levels of commitment. Secondly, concerns centre on the social and environmental implications of the potential relocation of production to non-parties or to countries with less stringent obligations. Such relocation could lead to parts of the carbon emissions simply moving to countries with less stringent climate regulation, more frequently referred to as *carbon leakage*. Since carbon emissions cause climate change no matter where they occur, carbon leakage reduces the effectiveness of domestic climate policies.<sup>4</sup>

Moreover, there is a development issue at stake. Trade-related rules in the form of border adjustment schemes have gained political support in particular from developed countries because they intend to address the competitiveness issue. Most developing countries however, are far more reluctant to the idea of carbon measures. Some have cautioned that binding measures to tackle climate change would hamper their efforts for economic growth and sustainable development. Instead, they argue, it should be the responsibility of industrialized countries to go ahead with strong efforts to

tackle climate change instead of burdening climate talks with the complicated dimension of competition and trade aspects.

Finally, there are uncertainties concerning the relationship between the UNFCCC, the Kyoto Protocol and the rules of the WTO. Proposals of border adjustment schemes that seem to be most consistent with the objectives and principles of the climate regime could be ruled to be non-consistent with WTO rules. On the other hand, non-discriminatory border adjustment schemes could offend the principle of northern leadership in the climate regime and can be expected to be strongly resisted by developing countries.<sup>5</sup>

## 1.4 Outline of the study

In the light of these political realities, this study will delve into the economic and legal aspects of unilateral border measures.

In the chapter on the legal analysis, we will have a look on the obligations under WTO/GATT law. We will focus on the applicability of border tax adjustment principles on carbon taxes on imports, as well as the legality of requirements to participate in a cap-and-trade scheme.

In the chapter on the economic analysis, we will have a look at the economics of climate change, recalling what economic theory has to say. We will also look closer at the three arguments most commonly referred to for introducing border carbon adjustments, and critically analyse these arguments on their effectiveness in relation to their intention. However, we are not scrutinizing the validity of these arguments *per se*. It does moreover not fall within the scope of this study to estimate the total costs for society or benefits for the environment of the possible introduction of border carbon adjustments.

## 2. Proposals on border carbon adjustment

There are a number of proposals to address the problem of carbon leakage and competitive concerns through border carbon adjustment.

One alternative is the introduction of a carbon tax on imports that is equal to a domestic tax. In this case, a border adjustment would charge imported goods the equivalent of what they would have had to pay for emissions caused by the production process had they been produced domestically. Such a scheme might also rebate the paid tax to exporters, ensuring that they are not disadvantaged in international markets.

Another alternative is the participation in a cap-and-trade scheme. A border adjustment would force domestic importers or foreign exporters of goods to buy emission allowances based on the amount of carbon emitted in the production process, in a requirement analogous to that faced by domestic producers.<sup>6</sup>

### 2.1 EC-regulation 2003/87/EC

The EU currently considers the inclusion of a requirement for importers of carbon-intensive products to buy carbon allocations in a future amendment of the European emission trading system (ETS). One of the reasons was initially the US rejection of the Kyoto Protocol which raised competitiveness concerns in the European Union when it launched the ETS. As the EU has extended the scope and coverage of the ETS, there have been growing concerns over the possible loss of competitiveness among domestic industries. Some European countries have strongly argued for the imposition of carbon taxes towards countries that do not have comparable domestic programs for climate mitigation. The current proposal of the European Commission, EC Regulation 2003/87/EC, however, does not contain any requirement for imports of carbon-intensive products. As an alternative, industries may be provided with free allocation of emissions allowances<sup>7</sup> to help address competitiveness and leakage concerns depending on the degree to which they are vulnerable. Instead, the EU Commission is entertaining the *possibility* of enacting a border carbon adjustment for the most vulnerable industries if a suitable international climate agreement is not reached.<sup>8</sup> According to EU officials there will not be any decision on introducing border measures until after the COP 15<sup>9</sup> in Copenhagen out of concern that the threat of a border measures would negatively prejudice nego-

tiations. The current work of the Commission is therefore concentrating on analyzing the potential impacts of an expanded ETS on carbon-intensive sectors, at the same time appealing for cautiousness when discussing border carbon adjustments.

### 2.2 US climate bills

The participation of China, India and other major emerging economies is a crucial issue for the United States in a post-2012 agreement. The lack of developing countries commitments was a major reason for the US rejection of the Kyoto Protocol. Unlike the European Commission, concerned about to negatively affect the outcome of climate negotiation, in the US many see the option of imposing border carbon adjustments as a useful incentive for major emitters in developing countries to take on commitments in the post-2012 negotiations.<sup>10</sup>

There is now an emerging consensus in Washington that the US should precede with mandatory action at home, with or without developing country commitments, provided the legislation includes trade provisions to protect US industry from competitive harm. Current US climate bills echo this competitiveness concern, and include provisions imposing costs on energy-intensive imports.

There are several bills currently discussed at the federal level. One of the legislative proposals which gained most attention in the Senate was the Lieberman-Warner proposal S. 3036, as amended by the Boxer Substitute Amendment and known as the Climate Security Act. This bill includes provisions that would require importers to purchase “international reserve allowances” for imported goods coming from countries not deemed to have adopted climate policy “comparable” to that in the US by 2014. However, the bill was prevented from getting to the floor of the Senate, when a “cloture” motion failed to get the required 60 votes so that debate could be stopped and a vote taken by the full Senate.

There are also several bills in the House of Representatives, for example the Dingell-Boucher bill which was made public in October 2008 and is likely to be the focal point of interest when the new House convenes in January 2009. The bill proposes the creation of an International Climate Change Commission that would assess, by 1 July 2013, which of the US’ trading partners have taken “comparable action” to limit their greenhouse gas emissions.

Countries defined by the United Nations as among the “least-developed” countries, and countries that emit less than 0.5 percent of total global GHG emissions, would be exempted from this requirement.

There is a consensus among climate experts and Congress-watchers that it is likely that unilateral border measures will be part of a climate bill in case a domestic mandatory cap-and-trade system is passed by Congress. There are, however, also opponents to border measures like the US Trade Council, and increasing concerns about the complexities of administering border measures. In any case, it is not likely that a bill will be passed in 2009. It may come at the earliest in 2010.



## 3. Legal analysis of border carbon adjustment

In this chapter, we will look into the compatibility of border carbon adjustment measures with WTO/GATT law. To illustrate the complexity of the issue, see the scheme in Annex 1.

### 3.1 Carbon tax on imports

This chapter examines first the question if GATT rules on border tax adjustment (BTA) can be applied to address potential competitiveness issues arising from the implementation of domestic environmental taxes. Secondly, border taxes may not discriminate between domestic and foreign producers.

#### 3.1.1 Definition of border tax adjustment

The GATT Working Party on Border Tax Adjustment, a key WTO instrument in the interpretation of the scope for border tax adjustment under the GATT, used the following OECD definition of BTA:

“Any fiscal measure which put into effect, in whole or in part, the destination principle (i.e. which enable exported products to be relieved of some or all of the tax charged in the exporting country in respect of similar domestic products sold to consumers on the home market and which enable imported products sold to consumers to be charged with some or all of the tax charged in the importing country in respect of similar domestic products.)”<sup>11</sup>

The line between prohibited border tariffs and permitted domestic taxes is set out in Article II.2.a GATT. This provision explains that the GATT’s strict rules on tariffs do not prevent a country

“from imposing at any time on the importation of any product...a charge equivalent to an internal tax...in respect of the like domestic product or in respect of an article from which the imported product has been manufactured or produced in whole or in part.”

#### 3.1.2 Applicability of border tax adjustment to carbon taxes

##### a) What kind of taxes can be adjusted at the border?

It is well-established under GATT law that only indirect taxes may be adjusted at the border. Indirect taxes are taxes that can be passed on to consumers.

The distinction between indirect taxes and direct taxes was originally based on economic theory

regarding the extent to which such taxes were passed forward into commodity prices. The burden of indirect taxes was thought to be passed through to consumers, while the burden of direct taxes was thought to be borne by the producer.<sup>12</sup> According to the definition of the OECD and the Report of the Working Party, border tax adjustments are “any fiscal measures which put into effect, in whole or in part, the destination principle”, that is to say, the principle according to which products themselves should only be taxed in the country of *consumption*. Allowing border adjustments only for indirect taxes was estimated to be consistent with the destination principle.

Since not all countries have tax regimes based on the destination principle, and since tax rates differ between countries, BTAs can be introduced to level the playing field in order to avoid either double taxation respectively non-taxation. If products are only taxed in their place of consumption, countries preserve the right to choose their own level of taxation and trade neutrality is maintained as all products in a given market compete on the same competitive terms.<sup>13</sup>

One example is the value-added tax (VAT) or sales tax, which is designed to be paid by consumers in the country of destination. Direct taxes, however, such as income tax, which is imposed on factors of *production* in the country of origin, are *not* eligible for tax exemption.<sup>14</sup>

##### b) Could a carbon tax be regarded as an adjustable product tax (= indirect tax) or would it be classified as a producer tax (= direct tax)?

**Pauwelyn**<sup>15</sup> finds it reasonable to classify a carbon tax as a product tax. He says the idea of the carbon tax is to make carbon-intensive products more expensive and its intention is to internalize the social cost of carbon, so the tax is shifted forward to consumers and therefore could be said to be adjustable at the border. He maintains that there has to be a “nexus” between tax and product which in the case of a carbon tax appears to be tight enough to allow border tax adjustment. According to **Mavroidis**, it would be unlikely that a panel would classify a carbon tax as a producer tax adjustable at the border.<sup>16</sup>

##### c) Can taxes on inputs which are not physically incorporated into the final product be adjusted at the border?

Can taxes on inputs like coal and oil be adjusted at the border even if they physically are not left in the

final product? This issue is very complex and treated by a number of scholars:

**Pauwelyn** admits that it remains unclear whether a tax on inputs which is not physically incorporated into the final product can be adjusted at the border. The reason is that such a tax targets not the physical features of the imported product itself, but rather the process or production method of the product abroad. In the *US – Superfund* dispute<sup>17</sup>, the United States were permitted to impose a domestic tax on certain chemicals also on imports that had used the same chemicals. Importantly, the panel did not specify whether these chemicals still had to be physically present in the imported product.

**Howse and Eliason** disagree with Pauwelyn, arguing that the definition in the Agreement on Subsidies and Countervailing Measures (SCM Agreement) makes clear that the relevant concept is whether inputs are used to create the final product, not whether they are physically embodied in it. Therefore, the language in Article II.2.a GATT “from which the imported product has been manufactured or produced in whole or in part” should be read to include not only products incorporated physically into the imported final product but also that are necessary to its manufacture or production. They therefore estimate Article II.2. GATT to be applicable.<sup>18</sup>

Other scholars<sup>19</sup> argue that the revision in the Uruguay Round broadened the category of adjustable taxes to allow rebates for indirect taxes on goods and services if they were “consumed” in the production of the exported product.<sup>20</sup> They point out the differences between the 1979 SCM Code and the 1994 SCM Agreement which slightly changed the impetus behind these provisions.<sup>21</sup> **Fischer** comes to the conclusion that a gasoline tax, for example, would be adjustable as energy is a qualifying material input in the exported products. On the contrary, an environmental tax on noxious emissions would not be adjustable as pollution is a “disincorporated material output”.<sup>22</sup> Others, however, reject this interpretation of the SCM Agreement.<sup>23</sup> Some scholars find it most unlikely that the 1994 SCM Agreement really intended to widen the scope for border tax adjustments, a step which, in their view, would be entirely contrary to the evolution of the multilateral trading system.<sup>24</sup>

Also **Mavroidis** has serious doubts on extending BTA rules to other fields than those which have been agreed on in the Working Party. He points out

that the GATT contracting parties never went further beyond the noted convergence on some taxes they found to be eligible for border tax adjustment. The understanding in the Working Paper was an exhaustive list and a partial agreement on rather uncontested issues in order to level the playing field. This shows, he argues, even the fact that there have been no disputes on the agreed taxes. The approach to expand the Working Paper to other fields like carbon taxes would open Pandora’s Box.<sup>25</sup> **De Cendra** reminds that the Working Party did not state clearly that the report was the ultimate report on BTA and its compatibility with GATT. The findings of the Working Party have instead to be put in the context of the group’s mandate, namely to examine the parties’ practice in regard to BTA.<sup>26</sup>

**Genasci** points out that the Working Party acknowledged the uncertainty surrounding this question, noting that there was a “divergence of views” on this matter. This divergence of views persists to this day.<sup>27</sup>

*To sum up, border tax adjustment can be introduced to level the playing field for domestic and imported products in order to avoid either double taxation respectively non-taxation. However, only indirect taxes (product taxes) are eligible for tax adjustment. If carbon taxes could be classified as product taxes is doubtful. Moreover, literature is divided whether a tax on inputs – like carbon – which is not physically incorporated into the final product can be adjusted at the border. Existing case law is not conclusive since they do not specifically address the issue of inputs which are fully consumed in the production process. As a consequence, to apply border tax adjustment principles to carbon taxes seems at least to be doubtful.*

### 3.1.3 Compliance with Article III.2 GATT (NT)

Even in the case that rules on border tax adjustment can be applied, a carbon tax may not discriminate between domestic and foreign producers. Consequently, if a carbon tax on imports is not accompanied by a domestic tax, such measure would run afoul the principle on national treatment in Article III.2 in combination with II.1 (b) GATT.

Can an emission trading scheme be seen as an equivalent to a domestic tax?

Article III.2 GATT states that imported products shall not be subject to internal taxes *in excess* of those applied to domestic products. The obligation for domestic industry to participate in an emission trading scheme could imply an equivalent burden as to pay a domestic tax.

**Fischer** estimates that there is an *economic equivalence* of emission tax and emission trading scheme. Both introduce an emissions price as a market mechanism for giving an incentive for pollution reduction. According to **de Cendra** it depends on how allowances of an emission trading scheme are *allocated* to qualify as a tax. Importantly, there has to be a payment to the government as taxes are “compulsory, unrequited payments”.<sup>28</sup> In the case allowances were auctioned, there would be a payment to the government. However, for the ETS, most member states have chosen to allocate all allowances *for free* to existing installations. On the other hand, the ETS foresees the possibility of auctioning allowances up to 10% for the second trading period, and there are increasing calls to introduce auctioning as the single method for allocation. This payment would be unrequited because the benefit provided by the government is not in proportion to the payment.<sup>29</sup>

If we follow the reasoning that allocation of allowances is from an economic point of view equivalent to a tax, then taxes on emissions can apply to allowances as well. In the case of free allowances, however, there is no payment to the government and thus the tax definition does not hold. **De Cendra** concludes that only a trading scheme in which emission rights are auctioned is sufficiently comparable to a domestic tax.

Other scholars do not consider an emission trading scheme to be equivalent to an internal carbon tax and doubt if such a wide interpretation of “tax” would be upheld in a WTO dispute.<sup>30</sup>

*To sum up, expert commentary is divided on the applicability of border tax adjustment on emission trading schemes. To auction allowances instead of handing them out for free assume most scholars at least to be a prerequisite for this.*

### 3.1.4 Discussion

The possibility to apply BTA principles to carbon taxes seems to be doubtful. Climate measures have not been in the mind of the Working Party when interpreting the principles on border tax adjustment in GATT rules. Moreover, only a few scholars seem to be convinced that it would be reasonable to classify a carbon tax as a product tax. Likewise, opinions differ when it comes to the question of treatment of inputs which have not been physically incorporated into the final product. Expert commentary is furthermore divided if emission trading schemes can be seen as an equivalent to an internal tax – an unrequited payment – on domestic products. To auction allowances instead of handing

them out for free assume most scholars at least to be a prerequisite for this.

Hence, there seem today only a few scholars advocating the application of the principle of border tax adjustment for carbon taxes.

## 3.2 Carbon regulation: participation in an emission trading scheme

The focus of the discussion has seemingly shifted away from tariffs towards importers’ purchases of emission allowances.<sup>31</sup> This would imply that climate policy took the form not of a carbon tax, but of a requirement for imports to hold emission allowances. To be in accordance with WTO law the scheme has either to be non-discriminatory according Article III GATT or to fall under the environmental exception rule of Article XX GATT.

### 3.2.1 Compliance with Article III.4 GATT (NT)

Article III GATT contains the National Treatment obligation. In regard to regulations it requires WTO members to treat foreign goods no less favourably than like domestic goods, Article III.4 GATT.

#### a) The scope of Article III GATT

The first stage in the analysis of National Treatment is whether the scope of Article III GATT covers border carbon adjustments.

First of all, the line between generally prohibited quantitative restrictions, Article XI GATT (QR), and generally permitted domestic regulation, Article III.4 GATT, is set out in an *Ad Note* to GATT Article III. This provision explains that, even if domestic (here: climate) legislation were to restrict imports at the border, if it is applied even on domestic products domestically, it should fall under the more flexible Article III GATT, permitting regulations for as long as they are not discriminatory.

The second question is, if a carbon regulation is limited to “product” measures or if it targets the “process or production method” of a product. This is due to the fact that the scope of Article III.4 GATT seems to be limited to regulations that “*affect the product*”.<sup>32</sup>

Two unadopted GATT panel reports – the Tuna-Dolphin cases<sup>33</sup> – found that process measures fall outside the scope of Article III and must, instead, be presumed to be prohibited under Article XI GATT. According to this panel, regulations can only be adjusted at the border if they apply to the product as such; not if they regulate the producer. However,

the Tuna-Dolphin cases were not adopted and more recent case law, like in Shrimp-Turtles, seems to support the application of Article III GATT even on process and production methods.<sup>34</sup> Scholars maintain that “WTO-thinking on the issue of border adjustment has evolved”<sup>35</sup> and that the Tuna decisions “offer the only example of such an argument within the GATT case law and therefore can generally be considered to be simply erroneous on this point.”<sup>36</sup>

Therefore, the prevailing opinion in literature and supported by recent case law is that Article III.4 GATT might be applicable to a border carbon adjustment regulation.

**To sum up**, most voices in literature draw the conclusion that it is likely that even process and production measures are covered by Article III GATT.

### b) like products

Once found to be covered by Article III GATT, the carbon regulation must also meet the substantive test in that provision. The second step in the analysis is therefore whether foreign and domestic goods are “like”.

The issue of “like product” is important because Article III GATT requires that an imported product be treated no less favourably than like products of

national origin. If two products are considered “like” then they should, as a rule, be treated the same. If they are “unlike”, then they can be subject to different tariffs, taxes or other regulatory measures.

Can products be distinguished based on factors not directly relating to the product as such but rather related to the production method?

Are products produced in a climate-friendly manner (“Kyoto-compatible manner”) and products produced in a carbon-intensive manner (“Kyoto-incompatible manner”) “like products”? In case they are not like, border measures treating these products differently, could, *per se*, not be in breach of Article III GATT. A fallback on the exception rule of Article XX GATT would then not be necessary.

However, it is unclear whether it is legitimate under WTO rules to regard two products which were *produced* in a distinct manner as unlike. The issue is complex and usually referred to as Processes and Production Methods (PPMs). Since climate measures do not directly target any particular products, but rather focus on the method by which greenhouse gases may be implicated related to production, PPM issues are critical for the compatibility analysis.

## Why is the use of PPM-based measures controversial?

- The most evident argument is that the implementation of PPM measures can be used to serve protectionist interests. By limiting imports to products produced in a specific manner, a WTO Member may make it more difficult and expensive for exporters from other countries to sell in its market, as they will have to adapt their PPMs to the requirements of the importing country.
- Financial burdens and technical difficulties created by PPM-based measures can be especially hard on smaller producers and on producers in developing countries.
- Critics claim that PPM-based import restrictions intrude the sovereignty of the exporting state because they aim to influence PPMs abroad. The claim regarding national sovereignty is linked to the idea that the importing state is imposing its values or ethical and cultural preferences on the exporting state. This criticism is generally countered with the argument that the importing state is not demanding the use of a particular PPM in the exporting country, but is only regulating what enters its own territory. This argument is based on the idea that countries are encouraged by international instruments such as the 1992 Rio Principles on Sustainable Development to adopt sustainable consumption and production patterns, and the use of appropriate PPM-based measures is one way of achieving this goal.
- Finally, an important critique concerns questions of equity: while PPM-based measures are most frequently used by rich, importing countries, the products that are denied entrance into these important markets are frequently those of developing countries.

To determine if a climate regulation is in breach of Article III.4 GATT, depends consequently on whether products are like or not. For example, is steel from China made with coal a like product to domestically produced steel using renewable energy?

First of all, GATT itself does not define the term “like products”.

Determining whether two products are “like” or “directly competitive or substitutable” has been held judicially to be a matter of a case-by-case examination of the facts, weighing all relevant evidence. The Appellate Body has approved a technique that consists of examining the factors enumerated in a GATT policy document<sup>37</sup>, namely physical characteristics of the products, end-use, consumer tastes and habits and tariff classification.

Some scholars argue that physically identical products can be considered unlike due to different production methods. **Howse and Eliason** assume that the approach in the WTO dispute EC-Asbestos was sufficiently flexible, that non-complying imported products could be distinguished unlike on the basis of the failure to control or internalise environmental externalities in the production process.<sup>38</sup> A reasonable consumer test – underlying an “informed consumer” according to **Bhagwati and Mavroidis** – would probably lead to the conclusion that a consumer who is aware of the environmental hazard that global warming might represent, will treat the two goods (Kyoto-compatible and Kyoto-incompatible) as unlike goods.

However, this seems to be valid only for the case where the process had been “incorporated in the final product”. Others have argued that the criterion “consumer tastes and habits” cannot be stretched so far as to render physically identical products “unlike”.<sup>39</sup>

The Appellate Body in the EC-Asbestos dispute did not go as far as to state that physically like products may be considered “unlike” because of their production methods. In this case, the “extent of competitive relationship” had relevance for the question of likeness. If a country argues that it needs adjustment at the border because of competitiveness concerns, it cannot turn around later under a “likeness” examination and say that high-carbon and low-carbon products do not compete in the first place.<sup>40</sup>

*The prevailing view seems to be that physically like products cannot be considered to be “unlike” because of their production method. Products produced in a Kyoto-compatible manner and products produced in a Kyoto-incompatible manner are according to this view “like products”.*

### c) no discrimination: “less favourable treatment”

Finally, Article III.4 GATT requires WTO members to treat foreign goods no less favourably than like domestic goods:

**Pauwelyn** argues that – even if products were found to be like – for a provision to be found to violate national treatment it must also be demonstrated that somehow the overall group of imported like products is affected more heavily than the overall group of like domestic production.<sup>41</sup> This would require that domestic production was inherently or historically predominantly low-carbon whereas imports were predominantly high-carbon. In other cases the Appellate Body required even a “detrimental effect on a given imported product” for as long as it could be “explained by factors or circumstances unrelated to the foreign origin of the product”.<sup>42</sup> If that finding were applied in an examination of a carbon regulation, Pauwelyn sees a possibility to explain why the regulation relates to environmental concerns of climate change and not to “the foreign origin of the product”. Then a carbon regulation would not discriminate imports and a justification according to GATT Article XX would be avoided.

**Howse and Eliason** agree with Pauwelyn, pointing out that even if the products in question were alike, it would still be possible to show that there is no less favourable treatment of the group of imported products relative to the group of like domestic products. Here, the actual design and operation of the scheme would be important. The first is the determination of what kind of foreign program for control of emissions would qualify as being equivalent to the domestic programme. The second issue is the determination of what kind of per-unit allowance would be required of an imported product where it originates from a jurisdiction that does not have an equivalent emissions control programme. Certain free allowances granted to domestic industry, for example, might be extended to imports.

*To sum up, most scholars today would apply Article III GATT on a carbon regulation targeting the process or production method. The prevailing view seems to be that physically like products cannot be considered to be “unlike” because of their production method. Some scholars assume that less favourable treatment of the group of imported products relative to the group of like domestic products can be avoided, depending on the design of the measure.*

### 3.2.2 Compliance with Article I GATT (MFN)

According to the MFN principle, any advantage granted by any Member to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in the territories of all other WTO members. This requirement is violated if a carbon regulation imposes requirements on the importation of industrial products from a WTO Member that does not engage in the post Kyoto regime, while such a measure is not imposed on the “like product” from another state. This principle is in particular relevant in case the border measure takes a country-based approach basing the distinction on national origin rather than environmental concerns.<sup>43</sup>

Likewise it would be a breach against Article I GATT to exclude developing countries depending on their stage of economic development. This stands, however, in contrast to Article 3.1 UNFCCC which says that any measure must comply with the principle of common but differentiated responsibilities and capabilities. This principle provides for different treatment of developing countries based on special needs and circumstances, future economic development and historical contributions to causing global warming.

*To sum up, the requirement of the most-favoured-nation principle in Article I GATT is violated if a carbon regulation imposes requirements on the importation of industrial products from a WTO Member that does not engage in the post Kyoto regime, while such a measure is not imposed on the “like product” from another state.*

### 3.2.3 Justification according to Article XX GATT

Article XX GATT permits limited and conditional departures from the principle of non-discrimination. Therefore, if a border carbon adjustment measure violates a substantive GATT obligation, it may nevertheless be found to be in compliance with GATT if it falls within one of the general exception provisions of Article XX (a)-(j) and if the application of the measure is not a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade, the so called “chapeau”.

However, it should be noted that Article XX GATT cannot be invoked to justify a measure to offset competitive disadvantages for domestic industry as Article XX does not cater for economic arguments.<sup>44</sup> Current discussions, however, emphasize the competitiveness loss if carbon measures are applied only in countries like the EU and the US, though combining it with environmental reasons such as carbon leakage would result in increasing greenhouse gas emissions globally. In order to justify

a measure under Article XX, the environmental argument needs to be made.

#### a) Article XX(g) GATT: relating to the conservation of exhaustible natural resources

Art XX(g)GATT reads as the following:

“relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.”

#### Is the planet’s atmosphere an “exhaustible natural resource”?

In **US-Gasoline** both the Panel and the Appellate Body determined that clean air was an exhaustible natural resource within the meaning of GATT Article XX(g). Most scholars find it uncontroversial that the earth’s atmosphere constitutes an “exhaustible natural resource”, mainly referring to **Shrimp – Turtle**.<sup>45</sup> **Pauwelyn** considers that international importance given today to the problem of climate change, it would be surprising if the WTO would not accept that the planet’s atmosphere is an exhaustible natural resource. The world’s atmosphere is, he states, a global commons; and carbon emissions are, because of their global impact, a collective action problem.<sup>46</sup> **Wiers** believes that discussions on the degree of certainty as to whether climate change is human-induced would resurface here, and the reports of the IPCC would play a major role in helping a WTO panel to interpret paragraph (g).

Another question and one yet to be answered is whether a territorial nexus should exist between the natural resources to be protected and the state imposing the measure. To date, there has been no clear-cut case in which the AB has been asked to rule on this issue; in **Shrimp-Turtle**, it avoided the question. According to **Wiers**, however, for climate change, “a global problem par excellence”, such a nexus could be argued to exist.<sup>47</sup>

#### Do import restrictions “relate to the conservation of the planet’s atmosphere”?

The “related to” test requires that there has to be a “substantial relationship” between climate legislation and the conservation of the plane’s atmosphere and climate. This relationship must be a “close and genuine relationship of means and ends”.<sup>48</sup> According to **Pauwelyn** there have to be “blatant inconsistencies or protectionist features in the legislation” for not passing the “related to” test.

Others are much more doubtful: According to the **OECD** it would be conceivable that a panel could adopt a restrictive construction of Article XX GATT. It could construe the primary objective of

the carbon adjustment measure as a discriminatory measure designed to protect domestic industry from the actual or perceived impact of the tax, rather than to mitigate the effects of climate change.

**Wiers** concludes that the measure really should contribute to attaining its environmental goal. Therefore, the imposing country would have to show that the import measures directly motivate foreign producers to lower emissions, or that it indirectly helps achieving the goal by keeping industry in the country and preventing it from moving abroad where its emissions are not restrained.<sup>49</sup> This could be doubtful having in mind the consequences of the Shrimp-Turtle decision on the environment, as countries like Malaysia rather reacted in contrary. Instead of changing its fishing methods they, annoyed with the US action – and in this case the US indeed tried to protect the environment – looked for other markets with the result of even more accidental catch of turtles.<sup>50</sup> Therefore it would be even more doubtful if the introduction of BCAs could motivate other countries to lower their emissions.

#### **Are import restrictions “made effective in conjunction with restrictions on domestic production and consumption”?**

Finally, the measure must be taken in conjunction with restrictions on domestic production or consumption. This is according to **Wiers** an important and not yet extensively elaborated issue in those cases where domestic measures are taken at production level – PPMs –, while for reasons of jurisdiction the exact same measures cannot be applied to foreign producers.<sup>51</sup> In Shrimp-Turtle and US-Gasoline, an “even-handedness” between domestic and import restrictions was required. According to **Wiers**’ interpretation this requirement would be less restrictive for production requirements than for product requirements. For import-restrictive measures for climate reasons a conjunction with domestic production restrictions could, according to him, convincingly be demonstrated in the case for the EU. The ETS, its sectoral EU-wide caps and the legal obligation for large emitters to have enough emission rights each year to balance their real emissions could, according to **Wiers**, satisfy this requirement. However, it would be a problem if part of the emission rights were given away for free domestically in a sector while no similar arrangements were made for imports in that sector.<sup>52</sup>

*To sum up, most scholars find it uncontroversial that the earth’s atmosphere constitutes an “exhaustible natural resource”. A number of scholars assume, however, that it will be difficult to demonstrate the environmental purpose*

*of the measure. Another problem could be to show an “even-handedness” between domestic and import restrictions in the case of free allowances to domestic industry.*

#### **b) Article XX(b) GATT: necessary to protect human, animal or plant life or health**

Most scholars find it more likely to resort to Article XX(g) since the qualifier “necessary” in Article XX(b) is generally perceived as more difficult to meet than the requirement of “relating to” in Article XX(g) GATT.<sup>53</sup> The imposing country has however to take recourse to Article XX(b) GATT if action against climate change is not considered synonymous with promoting clean air, and the measures are:

“necessary to protect human, animal or plant life or health”

The challenge here is to show that the measure is “necessary”. Moreover, the causal link requirement seems to be tougher than the “relating to” requirement in paragraph (g).<sup>54</sup> Leading decisions by the Appellate Body, including the recent Brazil-European Union retreated tyres case<sup>55</sup>, have developed guidelines to determine “necessity”. These guidelines can be summarized under three headings:

- how trade restrictive is the challenged measure?
- what is the value of the objective that the measure designed to protect?
- what contribution does the measure make to the stated objective?

**Hufbauer/Kim** finds that many more WTO cases need to be adjudicated before the contours of these guidelines can be reliably applied to climate measures. However, they point out, that in “retreated tyres”, the AB reaffirmed that the “necessity” of measures can be assessed both qualitatively and quantitatively, and the results from certain actions may only be evaluated with the benefits of hindsight. This time window may allow members considerable discretion when taking measures that they consider necessary to protect human life or health – such as greenhouse gas (GHG) controls. They find that the AB’s ruling to mark a further step in extending the flexibility afforded by Article XX. An extension of the “necessity” tests enunciated by the AB in the retreated tyres case to GHG emission controls would seem almost automatic.<sup>56</sup> **Hufbauer** and **Kim** draw the conclusion that, in the light of the AB’s ruling in key cases, many forms of GHG emission controls stand a good chance of passing WTO scrutiny. However, when it comes to the necessity-test under GATT Article XX(b), decided cases do not create a landscape of “anything goes” provided only that the measure purports to address

climate change. They foresee that some countries will enact their own unique mix of import bans, border taxes, and other mechanisms to force action.

The same arguments as in paragraph (g) are applicable to paragraph (b), too. Do the measures contribute to the achievement of the objective of protecting humans, animals and plants? Could the rather counter productive consequences after Shrimp-Turtle influence a panel decision? On the other hand it can be argued that the intention of the import measure is to directly motivate foreign producers to lower emissions, and indirectly by preventing carbon leakage. If this causal link were to be satisfactorily established, a weighing exercise would follow of the measure's contribution against its trade restrictiveness, taking into account the importance of taking action against climate change.

*To sum up, most scholars find it more likely to resort to Article XX(g) since the qualifier "necessary" in Article XX(b) is generally perceived as more difficult to meet. A positive outcome will depend on the weighing between the contribution to the protection of the environment and its trade restrictiveness.*

### c) Chapeau of Article XX GATT

Finally, even if all three conditions under the specific paragraph of GATT Article XX(b) or (g) were met, the legislation that was found to violate any other GATT provision would also have to fulfil the introductory phrase of GATT Article XX, the "chapeau", which declares:

"Measures are not 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."

The Appellate Body has developed criteria in previous environmental disputes and is likely to refer to at least the following three elements:

#### **Does climate legislation take account of local conditions in foreign countries or does it essentially require that foreign countries have to adopt their own policies?**

To be in compliance with WTO rules, any carbon regulation on imports has to be "sufficiently flexible" and "takes into consideration different conditions which may occur" in different foreign countries. This means that the country imposing the import measure may consider whether a foreign country already imposes emission cuts or otherwise addresses climate change. Consequently, this may oblige the country to impose lower or no requirements on imports from countries that have their own climate policies in place.

The requirement to take "into consideration different conditions which may occur" in different foreign countries, may force the imposing 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, 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".<sup>57</sup> According to **Pauwelyn** this may oblige the imposition of a graduated import regulation depending on the stage of economic development of the foreign country in question. This means the chapeau of Article XX may force the imposing country to have lower or even no carbon restrictions on imports from developing countries, especially the very poor ones. As a result, border carbon adjustment probably cannot fully be applied to developing countries, e.g. India or China.

**Bhagwati and Mavroidis** come to a different result, referring to the jurisprudence of *EC-Tariff preferences*. In this case the Appellate Body was facing a challenge against EU legislation according to which one-way preferences granted to developing countries were conditioned on the prior adoption of anti-drug policies. The Appellate Body held that, assuming such policies are based on *objective* criteria, such discriminatory preferences can be lawfully accorded. Bhagwati and Mavroidis find that it was not inconceivable that the signing of the Kyoto Protocol would be treated by the Appellate Body as providing such an objective criterion for discriminatory action against Kyoto-non-signatory nations. They assume that this case opens the door a little wider for those seeking to restrict the market access of products from member nations that do not satisfy a unilaterally specified PPM requirement.

#### **Before imposing the "unilateral" carbon legislation, did the imposing country engage in "serious, across-the-board negotiations with the objective of concluding bilateral or multilateral agreements" to address climate change?**

According to US-Shrimp, this does not require the actual conclusion of agreements, but at the very least good faith efforts by the imposing country to bring the foreign countries into the fold of an international effort (here: 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.

### **Does the implementation and administration of climate legislation respect “basic fairness and due process”?**

If the legislation foresees certain rules of certification or rebates for domestic efforts to fight climate change, transparency and predictability is important. The system has to be non-discriminatory in its procedures.

*To sum up, the chapeau to Article XX may force the imposing country to have lower or even no carbon restrictions on imports from developing countries, especially the very poor ones.*

### **3.3 Conclusions and discussion of the legal analysis**

Would the introduction of border carbon adjustments be legal? It can be noted that the consistency of border carbon adjustments with WTO law is to date highly unclear and would need more clarification.

Scholars are much divided on the possibility to widen the scope of the GATT's rules on border tax adjustment to even entail carbon taxes. This alternative is proposed by some scholars, arguing mainly with the GATT Working Party's interpretation of GATT rules from 1970. Is it possible to expand principles of border tax adjustment as they have been interpreted by the Working Party forty years ago to other fields like carbon taxes? According to our analysis this seems at least doubtful.

If emission trading schemes can be seen as equivalent to an internal tax on domestic products is uncertain as well. This seems to be particular the case as long as emission trading schemes allocate allowances for free.

Most scholars agree that the provision on non-discrimination, Article III GATT, is applicable even on production and process methods, PPM. However, it is uncertain if products made in a Kyoto-compatible manner and products made in a Kyoto-

incompatible manner would be found to be like products. Even if the products were alike, some scholars assume that less favourable treatment of the group of imported products relative to the group of like domestic products can be avoided, depending on the design of the measure. Then a carbon regulation would not discriminate imports and a justification according to GATT Article XX would not be necessary.

A justification according to the environmental exceptions of GATT Article XX would be necessary in case the carbon adjustment would not be seen to fall under the border tax adjustment rules or would be found to discriminate imports against domestic products.

Article XX GATT should be applied restrictively as it is the exception rule from the principle of free trade. Therefore, in order to justify a measure under Article XX, the environmental argument would be decisive for the legality of carbon adjustment measures. The WTO is sensitive to uncovering measures that allege to be for environmental reasons but serve in fact other interest, such as protection of domestic producers. In contrast to the groundbreaking case Shrimp-Turtle, where the US had a case for the environment, the introduction of border carbon adjustments have a much closer link to protectionism than it was the case in Shrimp-Turtle.

Moreover, Article XX GATT requires taking into account local conditions in foreign countries. This may force the imposing country to consider whether other countries have adapted comparable measures and if developing countries should carry the same burden as other countries. This may lead to that border carbon adjustment could not fully be applied on developing countries. As a consequence, this might question the appropriateness of introduction of border measures which is mainly focusing on emerging economies from developing countries. In any case, the design of a carbon measure will be crucial.



## 4. Economic analysis of border carbon adjustment

In this chapter, we will have a look at the economics of climate change, recalling what economic theory has to say. We will also look closer at the three arguments most commonly referred to for introducing BCAs, and critically analyse the current discussion regarding these arguments. However, we are not scrutinizing the validity of these arguments *per se*. We do also in section 4.3.3 introduce and briefly discuss some other arguments, political or practical rather than economic in their nature, for or against BCAs. It does however not fall within the scope of this study to estimate the total costs for society or benefits for the environment of the possible introduction of BCAs.

### 4.1 The economics of climate change

#### 4.1.1 Climate change is a market failure

According to economic theory, the climate is a pure example of a public good. The definition of a public good is a good that is *non-rivalled* and *non-excludable*. This means, respectively, that consumption of the good by one individual does not reduce availability of the good for consumption by others; and that no one can be effectively excluded from using the good.

The problem with public goods is that uncoordinated markets often fail to provide them. A *market failure* is the condition where the allocation of goods and services by a free market is not efficient.

*“Climate change is the greatest market failure the world has ever seen”.*

Nicholas Stern

Climate change is caused by the emission of greenhouse gases (GHG). The emission of GHG constitutes what an economist would call an external cost caused by for instance transports or the production of energy-intensive goods. An external cost is a cost imposed on any party not directly involved in an economic decision. In other words, the producers and consumers in a market do not bear all of the costs of the economic activity. As a result, there will be over-production of the good causing the external effect, in this case GHG.

#### *“The tragedy of the commons”*

The classic example for illustrating this situation is herders sharing a common parcel of land on which they are all entitled to let their cattle graze. It is in each herder's interest to put as many cows as possible onto the land, even if the common land is damaged as a result. The herder receives all the benefits from the additional cows but the damage to the commons is shared by the entire group. If all herders make this individually rational decision, however, the common land is destroyed and all herders suffer.

#### 4.1.2 The first best solution

The classic solution to dealing with external costs is to *internalize* them, that is, to make those responsible for causing the costs pay for them. In environmental economics this principle is often referred to as the “polluter-pays principle”.

The way preferred by economists for internalizing costs is through what is called a *Pigouvian tax*. Pigou treatment of externalities points to taxes based on the marginal damages caused by the external effect, in this case GHG emissions. Faced with such a tax, emitters would choose the appropriate level of abatement of emissions. The reason why this solution is preferred by economists is that a tax is transparent and predictable.

According to Stern, modern theory of risk does however indicate that long-term quantity targets may be the right direction for policy, with trading within those targets or regular revision of taxes to keep on course towards the long-run objective. This solution, in the form of a cap-and-trade system, is also one that has already been introduced or is being discussed by several countries. A major difference compared to a tax is that a cap-and-trade system is a better guarantee that the target be respected. Another important difference is that a tax applies equally to all emitters, whereas a cap-and-trade system will lead to emissions being cut by those who can do it at the lowest relative cost. The reason for this is that an emitter who can reduce emissions in a relatively cheap way will do this rather than purchase an emissions allowance. Emitters for whom emissions reductions are more difficult and thus expensive will on the other hand prefer to buy allowances than to reduce emissions.

The reason why economists generally are less fond of this solution than of a Pigouvian tax is that it is not possible to know in advance how much the emissions allowances will cost, contrary to a tax.<sup>58</sup>

#### 4.1.3 The need for collective action

When it comes to climate, it is a particular public good in the sense that it is global in its nature. Climate change, in turn, is a particular externality distinguished from other externalities in that

- it is global in its causes and consequences
- the impacts of climate change are long-term and persistent
- uncertainties and risks in the economic impacts are pervasive
- there is a serious risk of major, irreversible change with non-marginal economic effects.<sup>59</sup>

Furthermore, emissions in one country have the same impact as in any other country, and abatement efforts in one country can be nullified if emissions simply move to another country. Therefore, there is a strong need for handling the issue of climate change globally, through collective action.

“International collective action to tackle the problem is required because climate change is a global public good— countries can free-ride on each other’s efforts— and because co-operative action will greatly reduce the costs of both mitigation and adaptation.”<sup>60</sup>

Efforts are currently being made to handle climate change through global, collective action. Ministers from all over the world will meet in Copenhagen in 2009, with the aim of negotiating a new climate-deal. If negotiations are to succeed in defining a target level for future emissions as well as in leading to parties taking on binding reduction commitments, the world will have managed to choose the first best solution to handle the problem of climate change. However, there are today strong concerns about the outcome of the negotiations. As has been explained above, a deal in which not all major emitters participate will risk being inefficient, since the mitigation efforts of some can be nullified if others continue to emit GHG. These concerns have led to a number of alternative solutions being proposed and discussed.

#### 4.1.4 A possible second best solution?

One alternative solution that has been put forward is thus that countries taking on commitments to reduce their own GHG emissions would introduce

trade measures at the border against imports from countries not having taken on reduction commitments.

As has been mentioned above, under both the EU ETS and the potential cap-and-trade system being discussed in the US, trade measures would most likely occur in the form of a requirement that importers of carbon-intensive goods purchase emission allowances for goods sourced abroad, equal for those required for domestic producers.<sup>61</sup> Another possibility would be a border tax adjustment, which would mean an extra tariff at the border, based on the amount of emissions produced during the production process of the imported products.

According to economic theory, there are two major reasons why import tariffs are not as effective as a Pigouvian environmental tax. Firstly, unlike a Pigouvian tax, a tariff does not directly affect the cost of the polluting product as it works indirectly by influencing demand. Economic theory generally advocates that problems be tackled at their source. Secondly, a tariff by an importing country could possibly reflect only those detrimental effects that fall within its borders and hence does not take into account the overall externality generated by the production process.<sup>62</sup>

Theoretical analysis does however point to a role for trade restrictions in a second-best setting.<sup>63</sup> However, the arguments given are difficult to apply to climate change, which is global in its nature. Focus in the theoretical literature<sup>64</sup> coming to these conclusions has rather been on a two-way country setting where transboundary pollution in one affects the other, as opposed to global pollution like GHG-emissions.

*To sum up, economic theory sees trade restrictions as a less preferred solution to environmental problems than a Pigouvian tax or long-term quantity targets with trading. The few arguments that do give some support to trade restrictions as a tool to achieve environmental goals do not seem to apply to the particular issue of climate change, since it is global in its nature.*

## 4.2 Rationale for border carbon adjustment

Three arguments are usually referred to as support of the introduction of BCAs: to level the playing field between industries subject to reduction commitments and industries without such commitments, to avoid carbon leakage, i.e. that emissions simply move to countries not having taken on reduction commitments, and to persuade other

countries to take on commitments. Below, we will look further into these three arguments.

The two first are very closely linked together, in that they both deal with different kinds of relocation of production. What separates them is that they focus on different aspects of the relocation; the first one concentrates on economic interests whereas the other focuses rather on environmental concerns. As has been shown in the legal analysis above, which aspects of relocation that are targeted has implications for the applicability of WTO rules. In this section, we will try to look at them separately.

#### 4.2.1 Level the playing field

One of the arguments for imposing border measures is to level the playing field, as countries having taken on emission reduction commitments would otherwise lose in competitiveness compared to countries without reduction commitments. This would be a consequence of the increased costs caused by the reduction commitments. Below we will have a closer look at the competitiveness argument.

##### a) Defining competitiveness

Firstly, let us define what is meant by “competitiveness”. When listening to the debate about how to address the climate threat, one can get the impression that countries are competing against each other. However, to begin with, the economic success of one country does not come at the expense of other countries; there is no zero-sum contest between nations. Instead, it would make sense to look at competition at the firm- or sectoral level. According to Cosbey and Tarasofsky (2007), competitiveness at this level can be defined as *capture of market share*.

However, when choosing this definition, we still need to keep in mind the broader picture of the competitiveness of the whole economy. Discussions today focus much on the competitiveness of a few industrial sectors, in particular those who risk suffering from climate regulation. Governments may therefore be tempted to shield these concerned industries from the risks of losing competitiveness. However, doing that will be done at the expense of other economic actors, such as downstream industries, consumers and taxpayers.

##### b) Background

In our globalized world of today, in many sectors firms in one country are competing for market shares with firms in the whole world. Even products that traditionally have been considered more or less as non-tradables, such as cement, are today being

traded globally. This has put producers in developed countries under an increased pressure from competing firms, not least in emerging economies such as China. Over the last decades, we have therefore seen declining market shares for industries in developed countries.

According to Houser et al (2008), the manufacturing sector’s share of US GDP has declined from 23.3 percent in 1975 to 12.1 percent in 2005. Employment in manufacturing has seen both a relative and absolute decline, with the sector shedding 5 million jobs since the late 1970’s. The past decade has been particularly rough on US manufacturing, with overall output stagnating and employment falling by 17 percent.

Concerns about competitiveness, and demands coming from the industry and trade unions for protection against adverse effects from emission reduction commitments, should be seen against this background.

##### c) Which are the competitiveness concerns?

The traditional view upon taking on more ambitious reduction commitments than other countries is that countries risk losing competitiveness.<sup>65</sup> The reason for this would be that production becomes more costly or requires new investment, which may crowd out traditionally productive investment.

According to Cosbey et al (2007), competitiveness concerns in the climate change context can be divided into three categories:

- Varying degree of impact in different countries  
This problem, which Cosbey merely touches upon, relates to the fact that even under similar targets for action on climate change, and even given a harmonized approach to implementation, firms in some countries will suffer more than in others. Countries which have already pursued far-reaching policies for reducing carbon emissions, or that have a preponderance for clean energy, will have a harder time meeting a given target for emissions reduction than countries with large amounts of “low hanging fruit”. Cosbey states that more research is needed on this particular competitiveness concern.
- The non-Party problem  
The “non-Party problem” is the most relevant one in BCA discussions. It refers to the fact that industrial and energy sectors in Parties of a climate agreement will have to make expensive adjustments, something that is likely to imply a competitive disadvantage relative to the sectors of non-Parties. This is generally considered a very realistic scenario, and is also one explicit reason

why the US has refused to ratify the Kyoto-protocol so far.

- **The implementation problem**

The implementation problem relates to a fear that countries might distribute domestic-level obligations in a way that benefits particular sectors. This concern has been expressed especially in the context of the EU.

**d) Which sectors are the most likely to be concerned?**

The bulk of the economy is not vulnerable to foreign competition as a result of energy price rises. Different sectors will be affected differently by emission reduction commitments. Three main variables that influence the competitiveness impacts of climate policy can be identified<sup>66</sup>:

- **Energy intensity:** the more energy a sector uses in its production process, the more it will be vulnerable to energy price increases
- **Ability to pass cost increases along to consumers** as increased price of the sector's final product. This ability depends on availability of substitutes (the degree of competition)
- **Opportunities for abatement:** firms or sectors operating in an environment in which there are unexploited low-cost opportunities for abatement will have an advantage over those without "low hanging fruit" or where these have already been harvested. This concern is particularly relevant if the target is defined relative to current emissions levels.

Several studies have examined which sectors that have a potential to being concerned by a loss of competitiveness as a consequence of climate policy actions.<sup>67</sup> The general picture that emerges from these studies are that the sectors potentially concerned are iron and steel, aluminium and copper, cement and glass, paper and pulp and chemicals. Aluminium seems to be the most vulnerable of these.

According to Houser et al<sup>68</sup>, these five sectors together account for more than half of all CO<sub>2</sub> emissions from the manufacturing sector but less than 6 percent of US total emissions. At the same time, they represent no more than three percent of US economic output and two percent of nationwide employment. Put in this perspective, it is not the competitiveness of the entire American economy which is at stake.

**e) Are the concerns founded?**

Cosbey et al<sup>69</sup> state that with respect to the non-Party problem, there have been several recent sec-

toral studies from the EU, assuming non US-ratification of Kyoto. The main results of these are that there are only minimal non-Party competitiveness impacts. For example, Reinaud<sup>70</sup> has looked into the effects of the European trading system, ETS, on competitiveness in four vulnerable sectors: steel, pulp and paper, cement and aluminium. Her study finds little concerns for leakage, except perhaps in the aluminium sector, which acts on a highly global market with high energy input costs.

According to Cosbey, the key lesson is that there are competitiveness impacts associated with environmental regulation, that in most but not all cases are moderate. He also underlines that sectoral characteristics do matter when considering competitiveness impacts of environmental regulations.

When it comes to the implementation problem, Cosbey draws the conclusion that there seems to be potential for significant impact, particularly in the longer term, under more ambitious targets and in sectors where high energy prices can be passed on. However, in the medium term, the non-Party problem seems to be of bigger concern.

Houser et al refer to two studies by "Resources for the Future", quantifying the impact of US climate policy on output from the concerned industries. The results show that unilaterally imposing a 10\$ per ton charge for CO<sub>2</sub> in the US would mean 0.5 to 6 percent decline in output from the carbon intensive concerned industries. Work done in Europe on the impact of the ETS shows a slightly lower decline in output, in part due to the free allocation<sup>71</sup>, from 0.3 to 2.1 percent.<sup>72</sup>

The World Bank and the ICTSD on the other hand finds no evidence that industries' competitiveness is affected by carbon taxes.<sup>73</sup> When a carbon tax is imposed only by an importing country, then it adversely affects the competitiveness by exporting countries. This could be due to the off-setting measures applied by importing countries to mitigate the effect of such taxes. The analysis moreover suggests that exports of most energy-intensive industries increase when a carbon tax is imposed by the exporting countries, or by importing and exporting countries. According to the World Bank, this result would confirm the assumption that recycling taxes back to industry by means of subsidies and exemptions may be over-compensating for the disadvantage to those industries. The only exception in OECD-countries according to the World Bank study is the cement sector. In the paper-industry, trade actually increases as a result of taxes.

It can be discussed why the estimations of competitiveness impacts from carbon taxes vary from

no effect to a small but negative effect. One reason may be that compensation schemes employed make it difficult to measure competitiveness impacts at the national level. In fact, the OECD states that environmental taxes to date have not been identified as causing significant reductions in the competitiveness of any sector, which in part would be due to partial or total exemptions for energy intensive industries.<sup>74</sup>

According to several scholars, although competitiveness impacts so far have been moderate, it is likely that more ambitious commitments in the climate area will trigger more significant behavioural changes throughout the economy than most other environmental policies.<sup>75</sup>

#### **f) Can it be an advantage for competitiveness to move ahead?**

Whereas the traditional view is that there are potentially negative effects on competitiveness from carbon taxes, there is also another view claiming that on the contrary it can be a competitive advantage to move ahead and to take on more ambitious reduction commitments than other countries. One hypothesis within this view is the Porter-hypothesis, which says that stricter regulation would lead to more efficient companies developing new products and production processes.<sup>76</sup> According to Porter, the right policies must be chosen in order to get this effect. Porter cites a few examples of situations in which producers have won international market-shares following stricter environmental regulations, but he does not put his hypothesis through a formal test.

Subsequent theoretical research on the Porter-hypothesis has mainly focused on what preconditions must prevail in order for the initial costs related to environmental regulations to be neutralised as Porter states. The conclusion from the theoretical research is that it takes additional market failures to the one relating to the environment in order for the costs related to environmental regulations to be neutralised. Besides, this additional market failure must be addressed by the environmental regulation. Indeed, the assumptions necessary in order for costs being neutralised are very specific and are not generally present. Therefore, there is no general support from the theoretical research that environmental regulation is not associated with costs, nor with negative effects for competitiveness.

According to Brännlund, the very extensive empirical research that has been carried out in the area gives similar conclusions. It shows that environmental regulation does affect investment and

the modernisation of the capital stock negatively. Neither is there any general support of a positive correlation between environmental regulation and the development of productivity. On the contrary, the relation seems to be negative, that is, either regulation affects the development of productivity negatively or not at all.

Sweden is one example of a country that has moved ahead when it comes to climate regulation. If the Porter-hypothesis were true, it should therefore be possible to verify it in Sweden. Brännlund has analysed whether this can be done. His results do not confirm that Swedish carbon taxes have contributed to an increased productivity and profitability. On the contrary, the results rather indicate that the tax has contributed to a lower development of productivity in certain energy-intensive sectors.

Although particular examples can be found of situations in which companies have profited from strong regulatory environments at home to build competitive advantage abroad<sup>77</sup>, the overarching conclusion by Brännlund when it comes to the relationship between environmental regulation and competitiveness is that there is a cost related to moving ahead.

*To sum up, there is theoretical support for the fear that environmental regulation would reduce the competitiveness of some industries in countries moving ahead, that is taking on unmatched GHG reduction commitments. The empirical evidence so far does however not give much reason to worry; if there has been any impact at all on competitiveness, it has been moderate and seems in many cases to have been compensated for by complementary policies. However, many scholars agree that more ambitious reduction targets may change trade patterns in the future.*

#### **4.2.2 Prevent carbon leakage**

The second argument in favour of BCAs, closely linked to the previous one as explained in section 4.2, is to prevent the risk of carbon leakage.

##### **a) Defining carbon leakage**

Carbon leakage can be defined as the situation when the imposition of climate related taxes in one country results in the relocation of production, and hence of carbon emissions, to other countries. This can happen through the actual migration of carbon-intensive industries or through a transfer of market shares in carbon-intensive goods from countries with emissions caps to those without. These leakage routes qualify as “competitiveness driven” carbon leakage.<sup>78</sup>

##### **b) What does theory say?**

Climate regulation that includes putting a price on the emission of GHG will mean that relative prices

will change. This will lead to a reduction in demand for GHG-intensive products. Sectors that are energy-intensive and open to competition from countries with less ambitious abatement policies will not be able to pass on costs to consumers without risking market share. The short run response to such elastic, or price-sensitive demand, is likely to be lower profits. In the long run, with capital being mobile, firms are likely to take this into account when making location decisions.<sup>79</sup>

However, theory further suggests that country-specific factors, such as the skills of the workforce, access to technology and infrastructure, proximity to large consumer markets and trading partners, and other factor endowments, are likely to be the most important determinants of location. In addition, the business tax and regulatory environment, agglomeration economies, employment law and sunk costs are also key determinants. These factors will in most cases be more important than climate policies, maybe with the exception of the situation of the most energy-intensive industries.<sup>80</sup>

Relocation is furthermore less likely the stronger the expectation of eventual global action. One reason for this is that firms take long-term decisions when investing in plant and equipment intended for decades of production. Stern illustrates this by an example, aluminium production taking place in Iceland. Over the last few years, Iceland has become the largest producer of primary aluminium in the world on a per capita basis and the existing plants have plans for large expansions in the near future. Iceland's main advantage is the availability of water and emission-free renewable energy. Expectations of future globalisation action to mitigate GHG emissions is thus already acting as a key driver in attracting investment of energy-intensive sectors, away from high GHG energy suppliers.

According to Stern, the impact on location decisions is likely to be more substantial for mitigating countries bordering large trade partners with more relaxed regimes, such as currently Canada which borders the US. However, even in such cases, firms tend to be reluctant to relocate across borders, when they have markets in the home nation.

Cosbey et al (2007) point to a rich body of literature regarding "pollution havens", discussing whether stringent environmental regulations decrease competitiveness and drive firms to relocate to countries with less stringent standards. In the 1990's, the most common view was that environmental costs were too small relative to other factors influencing the decisions of firms to have a real effect. However, Cosbey claims that today recent studies criticize this work, based on method-

ological grounds. Methods used are likely to have underestimated the pollution haven effects.

According to Cosbey, newer studies instead find that increases in compliance costs due to environmental regulations do affect location. There is also new evidence showing that environmental stringency affects greenfield plant location and investment decisions, particularly for heavily polluting firms. When it comes to the question of whether the pollution haven effect is strong enough to induce industrial migration, results are less clear. It seems however that at current levels, pollution abatement costs inherent in stringent regulation are not as significant as a host of other determining factors: access to markets, labour costs, access to resources etc. Costs can be influential at the margin, though.

All in all, it seems that although climate regulation can be expected to have some influence, particularly on greenfield plant location and new investment, but less on relocation of existing plants, factors other than climate related taxes can be expected to have a relatively larger influence on location decisions. However, it is possible that environmentally related taxes may speed up inevitable restructuring processes.<sup>81</sup>

### c) How much leakage could occur?

There are a number of studies simulating the risks for carbon leakage. Reinaud refers to the IPCC Third Assessment Report, which shows results of simulations that indicate leakage rates of 5-20 percent in economy wide models.

How much leakage that can be expected varies between sectors, though. Reinaud presents some figures from simulations:

- A carbon tax of 21 USD introduced in Japan and EU 15 on steel and iron gives a leakage rate of 55 percent.
- A 20 Euro/ton carbon price achieved through a cap-and-trade scheme in the EU 27 gives leakage rates between 0,5 and 25 per-cent on iron and steel and 40-70 percent in the cement sector, depending on for example how allowances are distributed.
- None of the simulations in existing research focusing on sectoral leakage indicate a leakage rate near 100 percent.<sup>82</sup> In other words, carbon leakage would never entirely wipe out an effort to reduce emissions in an industry.

Generally, higher leakage rates would be expected for more trade-intensive sectors. It can also be expected that with a broader set of countries

engaged in mitigation, the leakage rate would decrease. Lastly, it is important to mention that estimated results vary greatly depending on the model chosen and the assumptions made.

#### **d) Is carbon leakage actually happening?**

In practice, it remains unclear how significant a risk leakage presents to the overall effectiveness of climate policy.<sup>83</sup> Stern claims that overall, empirical evidence supports the theory, and suggests that environmental policies do affect pollution-intensive trade and production on the margin, but there is little evidence of major relocations.<sup>84</sup>

The ICTSD states that the import-export ratio of energy intensive production in high-income OECD countries shows an increasing trend, mirrored by a decreasing trend in low-and middle-income developing countries.<sup>85</sup> This could be a reflection of some relocation of energy-intensive industries to developing countries, which were not imposing any additional constraints on their industries on account of climate change. According to the ICTSD, there is indication of some relocation of industries from the US to mainly East Asia and in particular to China.

Reinaud on the other hand claims that experience to date with the EU trading scheme does not reveal any leakage for the sectors that theoretically are at risk.<sup>86</sup> However, according to her, this is no guarantee that there will be no carbon leakage in the future.

The World Bank claims that there is some evidence of relocation of carbon intensive industries to developing countries, climate change measures in developed countries being one of many reasons. Developing countries do however continue to be net-importers of energy-intensive products. According to the World Bank, the lack of strong evidence of relocation suggests that while the overarching objective of climate-policies is to reduce emissions, these policies have been designed to shield sectors exposed to competition of industrialized economies.<sup>87</sup> However, the Bank states that in the medium to long run, more stringent policies in developed countries and increased growth in some developing countries could accentuate the risk of carbon leakage.

An interesting fact is that the US, albeit its non-ratification of the Kyoto-protocol, has experienced a more pronounced movement or leakage of energy-intensive sectors than the EU, which has taken on binding reduction commitments.<sup>88</sup> Three possible reasons can help to explain this fact according to the WB:

- industries have taken decisions to circumvent future policy shifts
- other factors such as cheap land, labour and growing markets in developing countries could be the primary cause for the movements
- movements within the EU are not being reflected

Other explanations could be that even in the US, there are a number of regional cap-and-trade schemes in place to reduce emissions, although these have not been bound internationally. Moreover, the price of energy can have increased due to other reasons than climate policy, something that may lead to industries relocating. This, however, should not be mistaken for carbon leakage.

#### **e) What happens to the total level of emissions?**

As stated earlier, the discussion of carbon leakage has its causes mainly in environmental concerns. Therefore, the relevant question is whether leakage happens and, in that case, what the effect is for climate change? Does leakage lead to new investment in clean production in non-party countries, simply because new plants are more modern than old ones or because investors plan for future reduction targets also in countries that do not have such today? Or, does leakage lead to an increase in GHG-emissions because production is being located to countries with lower requirements and less efficient technology?

Reinaud has looked into these questions. She claims that "... none of the existing simulations focusing on sectoral leakage indicate a leakage rate near 100%: in other words, carbon leakage would never wipe out entirely an effort to reduce emissions in one industry. The general notion that a cap in a country or region will result in even more emissions globally is contradicted by all quantitative studies."<sup>89</sup>

*To sum up, there is a certain theoretical risk for carbon leakage. This risk may be bigger than what was commonly believed up until recently. In practice, it still remains unclear how significant a risk leakage presents to the overall effectiveness of climate policy. Like in the case of competitiveness concerns, the relatively small effects that have been observed so far do however not mean that more ambitious reduction targets in the future may not lead to a more important prevalence of carbon leakage.*

#### **4.2.3 Creating incentives for climate commitments**

Depending on which GATT-article border adjustments would rely upon, measures can be directed at all countries (Art. III, II.2.a GATT) or countries

with similar conditions (Art. XX GATT). In practice, however, developed countries are expected to take on emission reduction commitments in Copenhagen in December 2009, why measures would be directed at certain developing countries. Discussions going on in the run-up to Copenhagen regard mainly important emitters in the developing world, and focus is generally on China and India. Other countries that are sometimes mentioned are for instance Brazil, Mexico and South Africa. It does not seem likely that proponents of BCAs would mean to address smaller and poorer developing countries.

Below we discuss why developed countries feel they need a carrot or a stick to persuade developing countries to take on commitments, and why developing countries are reluctant to do so. This argument is different from the two discussed above in that it is more political in its nature and that it aims at promoting the first best alternative, i.e. collective action (see section 4.1.3).

#### **a) Why do developed countries need border carbon adjustments to per-suade developing countries to act?**

As has been discussed in section 4.1.3, it is crucial to get also major emitters among the developing countries to participate in the fight against climate change considering their growing share of global emissions; indeed, even if developed countries were to stop emitting GHG today, that still wouldn't be enough to mitigate climate change. Today, China is the world's largest emitter of GHG in absolute terms.<sup>90</sup> Moreover, most future emissions growth will come from today's developing countries, because of more rapid population and GDP growth than developed countries, and an increasing share of energy-intensive industries.<sup>91</sup>

Although recognising that developed countries have the historical responsibility for climate change, proponents of BCAs in the developed world refer to the argument of "*carbon tax comparability*". This argument states that additional billions of tons of GHG do the same damage no matter where they come from. Therefore, major nations in the developed and developing world would need to impose very similar limits to GHG emissions. Stakeholders in developing countries do on the other hand refer to the opposite argument, the "*per capita comparability*". This argument says that the developed countries emitted billions of tons of GHG during their phase of industrialization, and that they are therefore the main responsible ones for the situation of today. As a consequence, these countries must heavily reduce emissions, while developing coun-

tries actually can increase theirs.<sup>92</sup> According to Hufbauer, the existing US proposals on BCAs try to address the concern that countries such as China and India insist on the per capita comparability.

Countries having proposed BCAs have different strategies towards the argument of influencing developing countries. The EU has suggested waiting to make a decision on BCAs until after the summit in Copenhagen in December 2009 out of concern that the threat of a BCA would negatively prejudice negotiations.<sup>93</sup> In the US, on the other hand, many see the option of imposing BCAs if countries do not sign onto a global deal or do not adopt policy deemed "comparable" to that in the US as an instrument for getting large developing countries to agree to reduce emissions.<sup>94</sup>

#### **b) Why are developing countries reluctant to participate?**

Developing countries will be particularly badly hit by the effects of climate change, for three reasons: their geography, their stronger dependence on agriculture and because with fewer resources comes greater vulnerability.<sup>95</sup> In fact, according to Stern, all development aspirations could be affected by climate change.

In spite of this, developing countries have so far been reluctant to taking on reduction commitments. Their reasons for doing so vary of course; the term "developing countries" refers to countries with very different levels of development, different policies and agendas etc. Therefore, it is difficult to talk too broadly of the agenda of developing countries as a group. Some features are however common for many countries. In this section we therefore try to depict some common arguments given by developing countries.

#### **The polluter pays principle**

Developing countries have contributed very little to causing climate change and therefore consider that they're not the ones that should pay. The industrialized world of today, on the other hand, has been able to build up their economies for centuries without worrying about emissions of GHG. They are therefore responsible for *historical emissions*. Still today, when it comes to GHG emissions per capita, the developed world has the major responsibility.

## India and climate change

According to the Economist, India's reaction to the threat of climate change has been rather haphazard. Recently India has shown signs of changing attitudes towards climate change, but up until that the country has had an "ugly reputation on the global front against climate change".<sup>96</sup> The country argues that its total emissions are relatively low and that it is relatively energy efficient; while GDP has risen by 9 percent annually the last couple of years, emissions have increased with 4 percent a year, to be compared with the Chinese score of one to one. Moreover, India argues that its people has the same right to wealth as anyone, and has reacted with fury to the American position that India and China should take on emissions cuts comparable to the American ones.

### Whose emissions?

Today, emissions from production in developing countries are higher than from consumption. This means that developing countries are in effect emitting GHG to meet the consumption needs of developed countries. For example, between 7 and 14 percent of Chinese total carbon emissions is a result of producing for exports to the US, according to Shui and Harriss.<sup>97</sup> Estimations also show that as much as one quarter of Chinese carbon emissions can be directly attributed to the production of goods that are exported—many to consumers in developed countries that no longer are engaged in such manufacture.<sup>98</sup> According to Shui and Harriss, US carbon emissions would have increased between 3 and 6 percent between 1997 and 2003 if goods imported from China had been produced in the US.<sup>99</sup>

In other words, developed countries do not only have the major responsibility for historical emissions, but are also responsible for some of the emissions *currently* coming from developing countries.

### Focus on growth and poverty reduction

Generally, economic development and poverty eradication are the overriding priorities for developing countries, whereas environmental goals simply are not at the top of most developing countries' agendas.

In general, economic growth is seen as a prerequisite for poverty reduction. For example, according to Ravallion, poverty is estimated to decline on average by two percent for a one percentage point

rise in economic growth across countries.<sup>100</sup> An annual growth of more than seven percent will be needed to halve severe poverty in Africa by 2015, and a five per cent annual growth is required just to keep the number of poor people from rising.<sup>101</sup> An economy such as India is dependant on an annual growth rate of on average 7 percent of GDP in order to pursue the current pace of poverty reduction.<sup>102</sup>

### Lack of institutional and technical capacity and financial resources

Developing countries generally lack both the institutional, technical and financial capacity to adopt their process and production measures in order to reduce GHG emissions. Therefore, developing countries often state that the effective participation by developing countries will depend on financial and technological assistance from developed countries.<sup>103</sup> Also Stern argues that although it is necessary for developing countries to take action, they should not be required to bear the full costs of this action. In fact, developed countries have undertaken commitments in the UNFCCC to transfer additional financial resources and climate friendly technologies to the developing countries.

### Actions taken although so far no binding commitments

Reluctance to take on binding commitments does not mean that developing countries do not take the climate threat seriously. China for instance has a comprehensive programme for reducing GHG emissions. According to Houser et al (2008), Chinese policy actions to curb the growth and improve the efficiency of its carbon-intensive industries include changes in tax policy equal to the imposition of \$50 per ton carbon tariff applied to exports of Chinese steel. India has adopted a National Action Plan on Climate Change, which seeks to promote sustainable development through the use of clean technologies.<sup>104</sup>

One reason commonly given for not taking on binding commitments is the language of the UNFCCC, which says that actions should be based on the principle of "common but differentiated responsibilities". Parallels can probably also be drawn to trade negotiations, where countries usually are willing to bind less market access and other reforms than they apply in reality, in order to preserve policy space.

## China and climate change

In the past couple of years, Chinese officials have begun recognising the problems related to climate change, and admit that coping with global warming presents severe challenges. China also admits its own contribution to the problem.<sup>105</sup> However, China is a major emitter and its energy consumption is increasing at the same pace as its GDP. The Economist reports that during the last four years, both China's GDP and its energy consumption has grown by an average of 11 percent per year. China has shown no inclination to commit to specific emissions cutting targets in Copenhagen, but is however anxious not to be seen as a global-warming villain. The country is working to try to curb the use of fossil fuels and promote renewable energy and has set a goal to reduce its energy intensity by 20 percent by the end of this decade. One way of doing this is by actively searching to attract investment from rich countries, not the least through the Clean Development Mechanism<sup>106</sup>; last year, 73 percent of all CDM projects took place in China, to be compared with six percent in India.

### c) A stick or a carrot?

By discussing the introduction of border measures way in advance of the Copenhagen meeting, developed countries have chosen the stick rather than the carrot to get developing countries on board. Whereas one consequence might be that developing countries decide to make reduction commitments to avoid being targeted by BCAs, another may be to create a bad negotiating climate in Copenhagen as well as in free trade negotiations in the WTO or other fora. Should that be the case, costs can be high for the world; the first best solution to mitigate climate change must be global action directed directly towards climate change. BCAs can be no more than a second (or third, or fourth...) best solution as it would target only traded goods, instead of overall global emissions, and come with a cost of restricted trade resulting in production taking place in countries that may lack competitive advantage.

*To sum up, it is crucial that developing countries participate in the battle against climate change. Efforts made only in the developed world will not be sufficient to prevent global warming. However, developing countries have a number of arguments for being reluctant to taking on binding reduction commitments. Some are political to their nature, and some are very concrete ones, such as a lack of capacity and resources.*

## 4.2.4 Discussion

The discussion above has shown that there is so far no strong evidence for substantial losses of competitiveness, nor for major carbon leakage, due to climate policy. The reasons for this may vary; the details of the instruments and policies applied are crucial when it comes to their final effects. The prevalence of compensation schemes also blurs the picture. However, there is a possibility that future, more ambitious measures taken to protect the climate will induce stronger effects on location of production and thus emissions.

In the light of this, it seems appropriate to advice governments to further analyse the risk for competitiveness impacts on the domestic industry, sector by sector, rather than basing any decisions about eventual border measures on mere perceptions of negative impacts. This is true also for the risks for carbon leakage. When doing this, consequences for developing countries must also be analysed.

It should also be kept in mind that reducing demand for emissions-intensive goods is part of the solution. Climate policy does aim at changing patterns in the economy that damages the climate through *inter alia* reducing the production and thus exports from relatively more polluting industries on behalf of relatively cleaner ones. Therefore, some changes in competitiveness, where relatively polluting industries lose markets shares to relatively cleaner ones, should even be welcomed.

When it comes to compensation schemes, it can be problematic if these are strong enough to nullify the effects of the climate policy. However, also in this case more thorough analysis is needed; if an industry actually reduces its emissions, and then is being compensated for its costs for doing so through complementary policies, then competitiveness can be protected whereas the positive climate effect is still valid.<sup>107</sup> However, if an industry is being compensated for its increased costs before any reduction has taken place, then competitiveness concerns is put ahead of climate concerns, and there will most likely be no effect on the level of emissions.

The developing countries will be the most badly hit by climate change. It is therefore likely that they would be willing to act according to their ability, even if it is not in terms of binding commitments. In order for this to happen, it is however necessary to find mechanisms to encourage action by these countries. Choosing to focus on BCAs is likely to be interpreted as a stick rather than a carrot by developing countries, and thus undermining the positive negotiating spirit that would be necessary in Copenhagen 2009.

## 4.3 Are border carbon adjustments an effective tool?

The underlying concerns usually referred to for justifying the introduction of BCAs in different forms have been discussed above. In this chapter, we will discuss whether BCAs could be an effective tool to address these three concerns. We will also introduce some other arguments for or against BCAs. In the end, we will summarize our discussions and draw some conclusions. However, it is not within the scope of this report to estimate the total cost for society for BCAs.

### 4.3.1 Economic modelling of border tax adjustments

The OECD has made a number of simulations of border tax adjustments. These will be presented briefly below.

#### a) The steel example

Firstly, the OECD simulates an OECD-wide carbon tax of USD 25 per ton of carbon emissions in the steel sector, *ceteris paribus*.<sup>108</sup> The results of the simulations give a total fall in steel production in the OECD-area by nine percent, with a greater reduction in more polluting plants. Steel production outside the OECD would rise by almost five percent, implying a fall in world steel production of roughly two percent.

Global emissions from the sector are estimated to fall by over 4,6 percent, or more than twice the percentage reduction in global steel production. This is explained by a substitution towards a cleaner input mix and cleaner production processes in the OECD.

In short, there is a loss in competitiveness as well as some carbon leakage, but the total environmental impact is still positive.

Thereafter, the OECD simulates the imposition of a border tax adjustment in the steel sector. If both import taxes and export subsidies would be implemented and differentiated across steel types, and if the border tax rates would be linked to emission levels in non-OECD countries, the decline in OECD steel production stemming from an OECD-wide tax might be as small as one percent.

At the same time, reduction in global emissions would be 5,1 percent, which is to be compared with the 4,6 percent without BTA. This is because BTA keep a higher share of world steel production within the OECD area, thus making more steel producers subject to the OECD-wide carbon-tax. Thus, imposing the BTA would mean a relatively smaller loss in competitiveness and a slightly better

effect for the climate. However, both practical and legal issues related to their implementation need to be solved.<sup>109</sup>

#### b) The cement example

In a second example, the OECD simulates the introduction of a carbon tax on cement at 15 Euros per ton in Annex B-countries<sup>110</sup>, without revenue recycling. This would lead to a decrease of emissions from Annex B-countries of about 20 percent, due to both less and cleaner energy being used in the production as well as to a decrease in cement consumption.

Part of these reductions would be compensated by an emissions increase in the non Annex B-countries, that is the developing countries, that export to Annex B. These countries are initially less CO<sub>2</sub>-efficient than Annex B-countries and the gap would increase with the implementation of the climate policy. World emissions would decrease by less than two percent.

The impact on cement production in Annex B-countries would be significant, -7,5 percent, because of both a cut in domestic consumption levels and a loss in competitiveness. Production and thus emissions in the rest of the world would increase; the corresponding leakage rate would be around 25 percent, a result in the upper range of leakage estimates in the IPCC third assessment report.

The OECD thereafter simulates two BTA scenarios, the first one using a complete BTA scenario and one WTO scenario.<sup>111</sup> Under the complete BTA, the loss in production of Annex B-countries would be limited to two percent instead of 7,5 percent. Annex B emissions would decrease by 13,5 percent thanks to a production drop plus an improvement of CO<sub>2</sub> efficiency. Emissions from the rest of the world would also decrease, very slightly, due to the decrease in production. World emissions would decrease by two percent, slightly more than without the BTA. However, non-Annex B price-competitiveness would decrease a little and the countries concerned would lose market shares and could claim a distorted competition in favour of Annex B-countries. In other words, the BTA would give a competitive advantage to Annex B-countries because they use cleaner production techniques.

Under the WTO BTA-scenario, Annex B-countries would suffer from a slightly higher cost increase than their competitors, which would lead to a small increase in imports. Exports would however rise despite this, because some production capacities would become available for exports. Total production actually would rise a bit in non-Annex

**Table 1. Summary of simulation results of a carbon price levied on the cement sector, 15 EUR/ton CO2**

	Cement prod. 2010, Annex B	Cement prod. 2010, ROW	Cement prod. 2010, globally	Cement prod. 2030, globally	CO2 emissions 2010, Annex B	CO2 emissions 2010, globally	Main losers, competitiveness impacts
<b>Annex B carbon tax/ETS</b>	▼ 7,5%	▲	▼	▼	▼ 18% (▼ 22% in 2030)	▼ less than 2% (▲ ROW)	Annex B producers: ▼ dom. consumption: ▼ competitiveness:
<b>Annex B carbon tax+ BTA</b>	▼ 2%	▼ 1%	▼	▼	▼ 13,5%	▼ 2% (▼ larger than non-BTA) (▼ ROW)	
<b>Annex B carbon tax+ WTO BTA</b>	▼ 3% (2010) ▼ (2030)	▲	▼	▼	▼ 15%	▼ (▼ smaller than BTA) (▲ ROW)	Consumers in Annex B: ▲ Cement price

B-countries, which would reduce the rationale for attacking this scenario as distorting competition. Emissions from Annex B-countries would decrease by 15 percent, which is more than the 13,5 percent in the complete BTA scenario. Emissions from non-Annex B would increase though, causing a leakage of around four percent.<sup>112</sup>

One must always be careful when using the results of economic modelling. The models describe an extremely simplified world, and simulations are always based on a number of assumptions that are more or less realistic. Having taken that into account, it is nevertheless interesting to study the simulations and to discuss the results.

In both the steel and the cement example, a mere unilateral carbon tax does result in a reduction in the total level of emissions. However, a loss in competitiveness in the countries imposing the carbon tax can be identified, as well as some leakage. In other words, two of the concerns brought forward by proponents of BTAs find support in the OECD-simulations. When introducing the BTA, global emissions decrease slightly more than in the unilateral scenarios. The negative impact on competitiveness is also less important, or even turned into a gain in competitiveness, suggesting that the BTA was set too high. There is in other words some support for BTAs as an instrument to deal with both competitiveness concerns and concerns for carbon leakage.

Lessons the OECD draws from its simulations are that economic instruments will not affect different firms within a given sector the same way. This is explained mainly by the different input combinations and the resulting differences in emission profiles. Secondly, protecting the competitiveness of energy intensive sectors in the OECD area through the recycling of tax revenues to the given sectors

are likely to lower the environmental effectiveness of the policy as a whole (see also the discussion in chapter 4.2.4).

In addition, we would like to draw attention to the fact that the OECD-simulations look at particular sectors in isolation from the rest of the economy. Effects on competitiveness do therefore not include the situation of other sectors in the economy, such as processing industries using steel or cement as input in their production.

Moreover, from a developing country perspective, it must be seen as problematic that the BTA would favour production in Annex B-countries because they have cleaner production techniques.

#### 4.3.2 Effectiveness related to the three arguments for BCA

As stated earlier, three arguments are often cited in order to motivate the need for BCAs. Below we will discuss how BCAs relate to these arguments. Competitiveness concerns and carbon leakage will be discussed in parallel, as they are closely linked.

At this point, it is necessary to underline that the design of BCAs is crucial; the purchase of emissions allowances can have different effects than paying an additional tax at the border. Similarly, whether exports are rebated or not change the impact, etc. Therefore, the discussion below shall be seen as a more general discussion, rather than as an answer to the question of the effectiveness of BCAs. Every concrete proposal needs to be analysed on its own merits.

##### a) Competitiveness and carbon leakage

In the previous chapter, we could show that several studies point to negative competitiveness impacts related to unilateral measures to climate change. In most cases these are moderate, and only a few sec-

tors are potentially concerned. Regarding carbon leakage, we showed that factors other than climate related taxes can be expected to have a relatively larger influence on location decisions.

However, it is also considered likely that more ambitious commitments will trigger more significant behavioural changes, and thus more important effects for competitiveness as well as for carbon leakage.

The OECD simulations gave some support both to the risk of carbon leakage and to competitiveness concerns related to unilateral measures.

Would then BCAs be an effective means of mitigating the competitiveness and carbon leakage impacts?

### Recalling and using economic theory

When it comes to the problem of climate change, there is a need for collective action. Even if countries individually introduce “pigouvian taxes” or cap-and-trade schemes, these will be too low from a global perspective since they will only take account of the climate change costs that falls on them. Moreover, as we have seen above, there may be a risk that countries actually lose economically in the form of reduced competitiveness, and the positive effects on climate will not correspond to the domestic effort because of the risk for carbon leakage.

As a consequence, there is a risk that countries that otherwise have high ambitions regarding environmental protection are discouraged, and thus lower their own level of ambition.

Thus, acting locally will not be optimal for the climate.

Introducing measures at the border, could, if constructed optimally, address the problem of the lowered domestic ambitions. Countries could adapt climate policies that correspond to their own values (and these can be expected to vary depending on national income: richer countries are generally prepared to pay more for environmental protection than poorer ones, which have other priorities) without risking that their efforts will be partly undone.

In other words, BCAs could address parts of the *domestic problems* with climate change, making sure that one country bears as much as corresponds to its values of the costs of its emissions, induced both by its own production and its imports. However, they can not address the *global problem*, since BCAs can never address emissions in other countries except for those related to import to the country introducing the BCA.

### Preconditions for BCAs to be effective

Reinaud has studied whether BCAs could be an effective instrument for addressing the competitiveness driven carbon leakage. According to her, there is some theoretical analysis that suggests that BCAs can fully address leakage in a scenario where a country or region unilaterally cuts GHG emissions and traded products are subject to equal treatment.<sup>113</sup> However, the design details of any particular BCA are decisive in determining its effectiveness. For example,

- the allocation mode at the domestic market has a considerable effect
- whether or not exports are rebated or not is also of importance. If the purpose is to mitigate the competitiveness leakage channel for a given sector in a given country, the BCA should also exempt exports from the climate policy costs. Only under this condition would, according to Reinaud, the CO<sub>2</sub> playing field for trade exposed sectors be levelled and the effectiveness of the BCA ensured.<sup>114</sup>
- BCAs would need to cover both direct and indirect costs, something that would be extremely complicated to manage
- Ideally, BCAs would cover all goods from a given emission-intensive trade exposed sector. However, given that this would be nearly impossible to carry through, targeting the BCA into the most emissions-intensive traded products in a sector could be one solution. Many practical issues remain to be solved also if choosing this alternative.

Reinaud also raises a number of practical and administrative issues that would need to be solved in order for BCAs to function.

### What trade could be affected?

BCAs, as they are currently being discussed in existing proposals in the EU and the US, would target imports only in a few energy-intensive sectors. Discussions usually focus on China and India. Therefore, it is of interest to look at how much imports that comes from these countries.

Existing research suggests that BCAs confined to those sectors whose competitiveness can potentially be affected by climate measures, would cover a fairly limited subset of Chinese and Indian exports to the US and Europe.<sup>115</sup> To verify this statement, we have looked into import statistics for the countries and sectors concerned. The figures below present the share of Chinese and Indian imports into the EU and US relative to total imports.

**Table 2. Imports from China and India to the EU and the US relative to total imports in the respective sectors 2007**

	EU imports from China	EU imports from India	US imports from China	US imports from India
Pulp and waste paper	0,2%	0,0%	0,2%	0,0%
Paper/paperboard/article	2,0%	0,1%	12,4%	0,3%
Chemicals/products n.e.s	1,5%	0,6%	4,9%	1,8%
Lime/cement/constr mat <sup>1</sup>	18,4%	4,7%	18,1%	6,9%
Glass	6,3%	0,4%	25,1%	0,4%
Iron and steel	5,8%	1,4%	13,8%	3,4%
Copper	1,3%	0,2%	4,9%	0,2%
Aluminium	1,5%	0,3%	6,1%	0,5%

Source: UN Comtrade

Import figures from India to the EU can be said to confirm the statement above; for most products, imports from India represent only a very small share of total imports, less than 1,5 percent. The only exception is lime/cement to the EU. The share of imports from India to the US is somewhat more important, particularly for chemicals, cement and iron and steel, but can still be considered as rather moderate.

Imports from China are more important both for the EU and the US. Again, the share is generally more important in US imports than in the EU. Indeed, imports from China seem to be more important than what could have been expected following the statement cited above.

When looking at these trade statistics, a number of facts should be kept in mind. For example, other countries than the EU and the US can decide to impose BCAs, making the effect of BCAs more noticeable for exporters in the targeted countries. Furthermore, other countries than China and India could possibly be targeted (depending *inter alia* on how WTO-rules are interpreted), and thus BCAs would cover a larger share of world trade.

When it comes to exports, these are generally not rebated in the existing proposals. Yet nearly all growth in demand for carbon-intensive goods like steel and cement is in the developing world. Addressing imports only will do nothing to prevent loss of market-share in uncapped export markets.<sup>116</sup> Moreover, if imports need to purchase emissions allowances on the carbon market, they would increase CO<sub>2</sub> prices and worsen even further the competitiveness of exports and trigger higher indirect costs.

### **b) Creating further incentives for countries to participate**

As in the discussion above, it is of interest to see how important exports to the EU and US are for the countries that could be the targets for BCAs. If only

small fractions of total production are exported to countries having introduced BCAs from countries without binding reduction commitments, it is unlikely that the BCA will have any significant effect on production methods in the countries against whom BCAs are directed.

Focusing on the American situation, Houser *et al* state that “The threat of losing access to the US market for carbon-intensive goods alone provides little leverage in inducing a change in the policies of other countries. While China accounts for 32 per cent of global steel production, only 8 percent of the 353 million tons produced in 2005 was exported. Less than 1 percent was sold to the United States. The US market accounts for 3 percent of Chinese aluminium production, 2 percent of paper production, and less than 1 percent of both basic chemicals and cement.”<sup>117</sup>

According to Houser *et al*, most of the demand for carbon intensive products comes from developing countries, China in particular. Therefore, policies in these countries could be of greater importance when it comes to influencing the decisions on production processes of exporting countries.

At the same time, Stern says that if effective, BCAs could have detrimental effects on developing countries with high export dependency on carbon-intensive goods.<sup>118</sup> In light of Housers analysis, this seems contradictory. The reason why different scholars come to such different conclusions is probably that it is not yet clear against whom BCAs would be directed, nor on which products. As has been shown in the legal analysis above, it is not even clear whether it would be compatible with WTO rules to raise BCAs towards developing countries. If it would be so, it is moreover not clear which countries the EU or US or other countries imposing BCAs would like to direct the measures against; China and India are the ones most commonly discussed, but at this stage it is probably premature to exclude that other countries could be

concerned as well. Moreover, even in the case of China or India, adverse effects of BCAs can be significant for certain producers, if not for the economy as a whole. The uncertainties however do give reason for governments to carefully analyse potential impacts on developing countries, before considering introducing BCAs.

All in all, it does not seem very likely that BCAs would be an effective tool to persuading large developing country emitters to take on binding emission reduction commitments. On the contrary, the introduction of BCAs could even make it considerably more difficult to build the trust necessary for future international co-operation. (See also chapter 4.2.3).

### 4.3.3 Other arguments

We have now discussed the three arguments commonly used to motivate the introduction of BCAs. Following the debate on BCAs, there are a number of other arguments, political rather than economic, in favour or against, that can be mentioned.

One important political argument for BCAs, maybe the most important one of all, is that introducing BCAs is by many seen as a prerequisite for passing a cap-and-trade system in developed countries, in particular the US, and for getting the US to participate at all in a coming deal on climate change. This aspect relates to the discussion in section 4.3.2 a about addressing the domestic problem. The importance of this argument should not be underestimated, particularly against the background that the US has already once chosen to stay out of a global climate deal when not ratifying the Kyoto Protocol. However, the potential benefits of such a scenario must be weighed against the risk that the measure would prevent major emitters among developing countries from taking on binding reduction commitments (see chapter 4.2.3).

On the positive side, Nobel Laureate Joseph Stiglitz has advocated BCAs. His motivation was though that they should be addressing the US emissions, since he argues that the American industry is being subsidized as it does not have to pay the full price of its carbon emissions.<sup>119</sup>

Proponents of BCAs are otherwise more frequent among politicians than among scholars in economics. One obvious reason is that they want to get re-elected, and that probably becomes easier if they give their voters the impression of doing good for the climate, at the same time as reducing costs for the homecountry and working against free-riding by competing countries. Leading French politicians are to be found in this group (Jacques

Chirac, Dominique de Villepin, Nicholas Sarkozy), as are many American ones (Joe Lieberman, John Warner, Jeff Bingaman, Arlen Specter).

Also many lobbyists do, for obvious reasons, support the idea of BCAs. Examples are the American Electric Power and the trade union International Brotherhood of Electrical Workers.<sup>120</sup>

On the negative side, the most important argument is that BCAs would be inefficient in the sense that they would only touch small fractions of total emissions. Production that is intended for domestic consumption in the targeted countries or for exports to other countries than those imposing BCAs would not be concerned. This is one main reason why BCAs are clearly a less preferred option than a global Pigouvian tax, which would concern all the emissions taking place in a country.

Secondly, several of the current BCA proposals would assess the embedded carbon of a good based on a nationwide average. Such a calculation would therefore not reward individual firms for reducing emissions.

Thirdly, many fear that using trade instruments for climate purposes could be the beginning of a trade war as it would open up for various arguments of why protective measures could be motivated.

Last, but definitely not the least, there is the issue of feasibility of border carbon adjustment. Scholars agree that assessing carbon at the border is complicated. Giving the same treatment to domestic as to foreign producers requires an accurate assessment of the amount of CO<sub>2</sub> emitted during the production of a specific good. For the most carbon-intensive intermediate products like steel, aluminium, chemicals, and cement, this is a “daunting task”, given the enormous variety of production processes employed and fuels used. The amount of carbon “embedded” in a ton of steel varies greatly both by country and individual company. For final goods like electronics or vehicles, accurately assessing embedded carbon at the border is, according to the Peterson Institute “next to impossible.”<sup>121</sup> Moreover, as we could see in the legal analysis, it is unclear whether it is legitimate under WTO rules to set up requirements on production methods.<sup>122</sup>

For this reason, discussions on BCAs mainly focus on raw materials or low processed goods. This motivates us to recall the discussion in the previous chapter regarding whose competitiveness we are talking about. Protecting a few commodities or low-processed goods would mean passing the costs on to the processing industry. Thus, the competitiveness of other downstream industries could be negatively affected as a result of the BCA.

#### 4.3.4 Discussion

BCAs could theoretically be a means of addressing *parts* of the *domestic* problems with climate change, meaning that they could help countries with high environmental ambitions to take on measures for internalizing the costs for climate mitigation at home. They can never be expected to address the *global* problem, though. In order for BCAs to be effective with respect to levelling the carbon playing field, a number of prerequisites need to be fulfilled. For instance, exports need to be rebated and both direct and indirect costs need to be covered. Even if this is done, a range of practical and administrative issues that are extremely complicated need to be dealt with. One important example in this respect is the issue of how to measure the carbon content of a product.

Existing research suggests that BCAs applied in those sectors whose competitiveness can potentially be affected by climate measures, would cover a fairly limited subset of Chinese and Indian imports to the US and Europe. At the same time, exports are generally not rebated in the existing proposals, consequently BCAs would not deal with competitiveness concerns on the export market. BCAs would therefore not be the key to address all competitiveness problems that touched industries may have.

Only small fractions of the production of the concerned countries are actually exported to the EU and the US. Therefore, BCAs do not seem to be an effective tool to persuade large developing country emitters to take on binding emission reduction commitments.

### 4.4 Conclusions of the economic analysis

Putting a price on GHG emissions globally through a global Pigouvian tax or possibly a cap-and-trade system would be the preferred solution to the issue of climate change. The introduction of border carbon adjustment measures is not likely to improve the chances of reaching a global climate deal.

Three arguments are usually referred to for motivating the introduction of border carbon adjustment: to level the playing field, to avoid carbon leakage and to create incentives for important emitters among the developing countries to take action against climate change.

Economic modelling gives some support to the effectiveness of BCAs. While there is only a slightly positive impact on the environment compared to unilateral action, adverse effects on competitiveness and carbon leakage are reduced. These models do however look at particular sectors in isolation from the rest of the economy, which means that possible adverse effects regarding competitiveness of other sectors of the economy are not included.

Theoretically, there is some support for BCAs as a means to manage risks for loss of competitiveness as well as carbon leakage, induced by unmatched climate regulation. BCAs could however only address the domestic problems with climate change by helping countries with high environmental ambitions to take on measures for internalizing costs for the climate.

In order for BCAs to be effective in this respect, a number of prerequisites need to be fulfilled. One is that exports must be rebated. This element is however usually not included in existing proposals on BCAs. In addition, there is a range of practical and administrative issues that need to be solved, something that seems extremely difficult to achieve.

When it comes to the argument of influencing important emitters among the developing countries, BCAs do not seem to be an effective tool. The main explanation is that only very small shares of total production of the concerned goods are being exported to the EU and US, whereas most of the demand for carbon intensive products comes from developing countries. Besides, the negotiating spirit could be worsened if countries that are historically and perhaps even currently the main responsible ones for climate change, threaten others with BCAs on imported goods.

## 5. Conclusions

Climate change is a global problem; greenhouse gas emissions have the same adverse impact wherever they come from. Even if developed countries bear a historical responsibility for today's situation, reducing emissions only from the developed world will not be sufficient, nor efficient, to address the problem of climate change. To reach a global deal for mitigating climate change is crucial to solve the problem. Such a deal should ideally include putting a global prize on greenhouse gas emissions.

There are, however, concerns about the outcome of climate negotiations in Copenhagen in the end of 2009. In order to improve the chances of reaching a global climate deal, other measures to mitigate climate change are currently being discussed, one of which is the option of introducing border carbon adjustment measures. This would mean imposing either a carbon tax at the border or a requirement that allowances are bought for carbon-intensive imports in a domestic cap-and-trade system. Several questions of legal and economic nature arise from this.

Firstly, and most importantly, would such measures increase or worsen the chances of reaching a global deal? Secondly, although not being an optimal solution, could the measures proposed be effective with respect to their intention? And thirdly, would such a measure be compatible with WTO rules?

This report focuses mainly on currently ongoing discussions about border carbon adjustments, which centre much on existing proposals from the EU and the US. Departing from these discussions, we examine firstly what the literature has to say about their legal implications, and secondly look into and analyse the arguments given for introducing border carbon adjustments.

In practice, developed countries are at this stage expected to take on binding commitments in a post-2012 agreement to reduce carbon emissions. Major emitters among the developing countries, on the other hand, seem to be much more unwilling to do so in a post-2012 deal. Border carbon adjustments would therefore target mainly major emitters among the developing countries. The two countries most commonly referred to are China and India. Apart from being major emitters of greenhouse gases, they are also important competitors to the EU and the US. Other countries sometimes mentioned are for instance Brazil, Mexico and South Africa. It seems unlikely that countries imposing

border carbon adjustments intend to target smaller and poorer developing countries.

Having said this, let us turn back to our first question: would border carbon adjustments give an incentive to major emitting countries among developing countries to take on binding reduction commitments? According to our analysis, this seems unlikely. To begin with, it is unclear whether it would at all be compatible with WTO rules to raise border carbon adjustments against these countries. Moreover, exports from China and India to the EU and the US of the products likely to be touched by border carbon adjustments constitute only a small share of the total production in these countries. In fact, most of the demand for carbon intensive products comes from developing countries, China in particular, and not from the EU or the US. If only small fractions of total production are exported to countries having introduced border carbon adjustment, it is unlikely that the border measures will have any significant effect on production methods in the targeted countries. In the contrary, introducing border carbon adjustments could actually rather risk worsening the negotiating spirit before Copenhagen, and would in that case be counter-productive.

Our second question concerns the possible effectiveness of border carbon adjustments with respect to their motives. Two other arguments are usually referred to in favour of introducing border carbon adjustments: to level the playing field between industries having to face costs for reducing emissions and industries in countries without such requirements, and to avoid carbon leakage, that is the simple relocation of emissions from one country to another as a consequence of the environmental regulations.

So far, there is no strong evidence for substantial losses of competitiveness, or for major carbon leakage, due to climate policy. The reasons for this may vary; the details of the instruments and policies applied are crucial when it comes to their final effects. The prevalence of compensation schemes also blurs the picture. However, there is a possibility that future, more ambitious measures taken to protect the climate will induce stronger effects on location of production and thus emissions.

Theoretically, there is some support for border carbon adjustments as a means to manage risks for loss of competitiveness as well as carbon leakage, induced by unmatched climate regulation. Indeed,

border carbon adjustments could help countries with relatively high environmental ambitions to internalize costs for emissions induced for their own domestic consumption. In order for border carbon adjustments to be efficient in this respect, a number of prerequisites need to be fulfilled. One is that exports must be rebated. This is, however, usually not included in existing proposals on border carbon adjustments. In addition, there is a range of practical and administrative issues that need to be solved, something that seems extremely difficult to achieve.

Now, let us have a look on the legal implications of border carbon adjustments. Our conclusion is that the consistency of border carbon adjustments with WTO law is unclear and will fundamentally depend on the design of the scheme.

Mainly three lines of argumentation can be found in literature:

The first line of argumentation is that principles in GATT on border tax adjustment could be applied on carbon taxes. In this respect, it is debated if a carbon tax could be classified as an indirect product tax and if border tax adjustment is applicable for taxes on inputs – like carbon – which are not physically incorporated into the final product. This alternative is proposed by some scholars, arguing mainly with the GATT Working Party's interpretation of GATT rules from 1970. Is it possible to expand principles of border tax adjustment as they have been interpreted by the Working Party forty years ago to other fields like carbon taxes? According to our analysis this seems at least doubtful.

The second line of argumentation is that as long as imported products are not treated less favourably than like domestic products, there would be no discrimination and, hence, no breach of WTO rules. This would require that products made in a Kyoto-compatible manner – domestic products – and products made in a Kyoto-incompatible manner – that means coming from countries without comparable climate measures – are not “like products”. Most scholars seem, however, to conclude that these products are like products and the way they have been produced does not give any excuse for treating them differently. Some scholars assume that less favourable treatment of the group of imported products relative to the group of like domestic products can be avoided, depending on the design of the measure. Then a carbon regulation would not discriminate imports and a justifica-

tion according to GATT Article XX would not be necessary.

The third line of argumentation is to justify border carbon adjustment under the environmental exception of Article XX GATT and its chapeau. This would be necessary in case the principles of border tax adjustment could not be applied to carbon taxes or a border carbon adjustment would be found to discriminate against imports or between different sources of import.

The environmental argument could, according to some scholars, be decisive for the legality of carbon adjustment measures. The WTO is sensitive to uncovering measures that allege to be for environmental reasons but in fact serve other interests, such as the protection of domestic producers. In contrast to the ground-breaking case *Shrimp-Turtle*, where the US had a case for the environment, the introduction of border carbon adjustments seems to have a much closer link to protectionism than in the case of *Shrimp-Turtle*.

Moreover, the environmental exception of Article XX GATT requires that the measure takes into account local conditions in foreign countries. This may force the imposing country to consider whether other countries have adapted comparable measures and if developing countries should carry the same burden as other countries. This may lead to that border carbon adjustment could not fully be applied on developing countries. As a consequence, this might question the appropriateness of introduction of border measures which is mainly focusing on emerging economies from developing countries.

To sum up, it is not likely that the introduction of border carbon adjustment measures improves the chances of reaching a global climate deal, involving all major emitters. However, the measures may address some concerns related to carbon leakage and competitiveness.

The legal compatibility of border carbon adjustment with WTO rules is uncertain and, if introduced, it is likely that a dispute panel will decide about the legality.

The design of border carbon adjustment will be an import factor both in regard of effectiveness and legality.

A border carbon adjustment scheme would be extremely complex to administer.

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# Endnotes

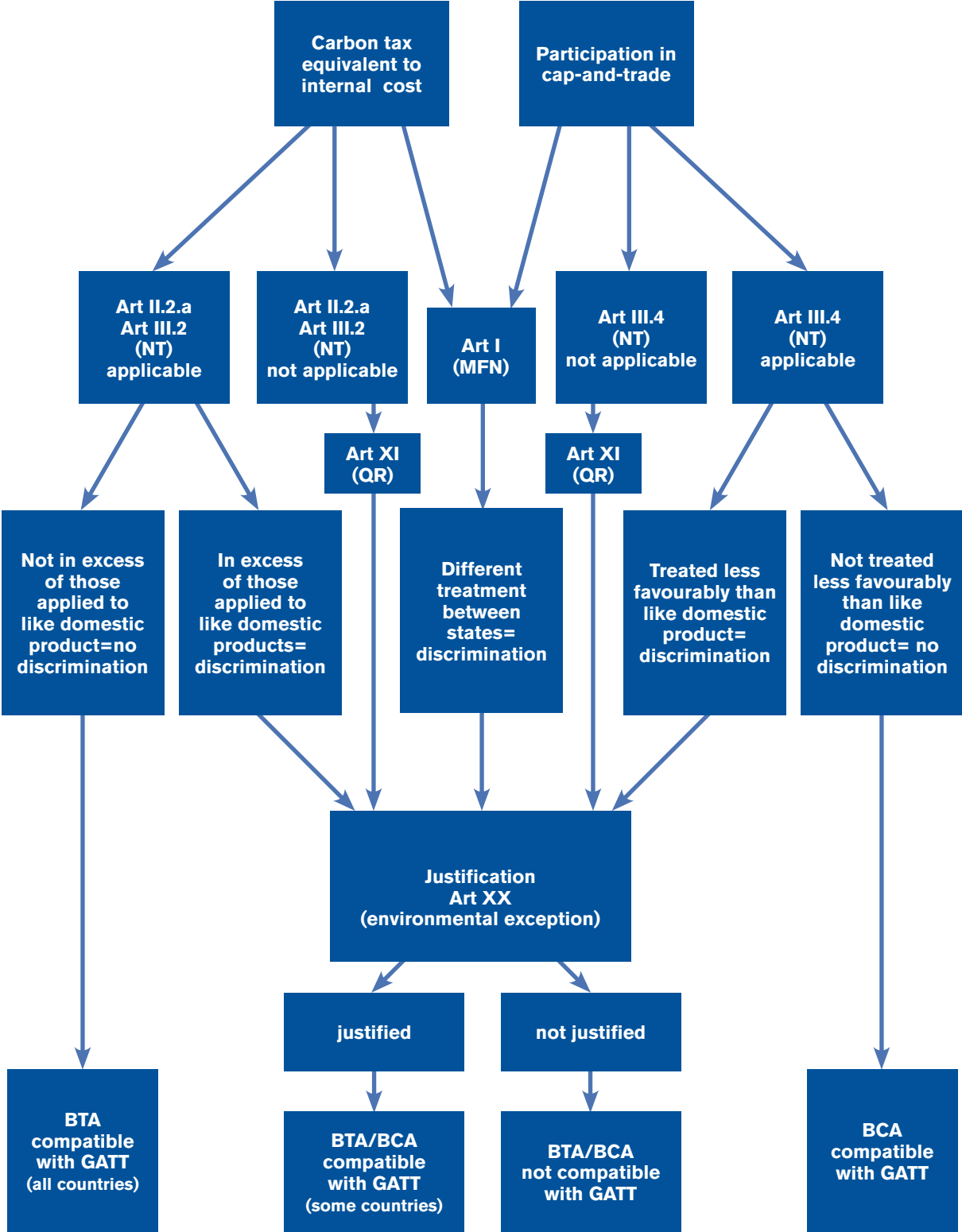
- 1 "Non-annex I countries" according to UNFCCC.
- 2 Report available at [www.assemblee-nationale.fr](http://www.assemblee-nationale.fr). The idea put forward at the time by De Villepin was a carbon tax on the imports of industrial products from countries refusing to engage in the Kyoto Protocol after 2012.
- 3 European Parliament, NFTC
- 4 Ismer, "Carrots and sticks: unilateral trade measures in post-2012 scenarios". Backgroundpaper, prepared for the International Workshop on Post-2012 Climate and Trade Policies in Geneva, September 2008.
- 5 Eckersley, "Understanding the interplay between the climate regime and the trade regime", prepared for the International Workshop on Post 2012 Climate and Trade Policies in Geneva, September 2008; National Board of Trade, "Climate and Trade Rules – harmony or conflict?", 2004.
- 6 Two other approaches have been discussed, however gained less attention. The first is a requirement that all imports meet a standard for carbon intensity equivalent to that applied to domestic producers. The other is the application of countervailing duties based on "embedded carbon" and imposed on products from energy-intensive industries originating in countries that have implicitly "subsidized" these industries by failing to regulate greenhouse gas emissions.
- 7 Free allocation refers to the fact that some emissions allowances have been distributed free of charge.
- 8 See Article 10 a 2003/87/EC.
- 9 Conference of the Parties.
- 10 Summary notes Copenhagen, June 2008.
- 11 Report of the Working Party on Border Tax Adjustments, adopted on 2 December 1970, L/3464.
- 12 Genasci, Matthew, "Border Tax Adjustments and Emissions Trading: The implications of international trade law for policy design", CCLR 1/2008, p. 35.
- 13 Pauwelyn (2007).
- 14 The eligibility for tax adjustment has initially been discussed by the Working Party on Border Tax Adjustments. The Working Party concluded that there was convergence of views to the effect that taxes directly levied on products were eligible for tax adjustment, L/3464, 20 November 1970.
- 15 See also Dröge, Susanne et.al. "National climate change policies and WTO law: a case study of Germany's new policies", World Trade Review (2004).
- 16 Mavroidis, EAERE climate conference in Gothenburg July 2008.
- 17 US – Superfund, United States – Taxes on Petroleum and Certain Imported Substances, Panel Report, adopted 17 June 1987, L-6175.
- 18 Howse and Eliason, "Domestic and International Strategies to Address Climate Change: An Overview of the WTO Legal Issues", 2008.
- 19 Fischer, "Comparing Policies to Combat Emissions Leakage: Border Tax Adjustments versus Rebates", (2008); Dröge et.al., (2004).
- 20 Note, the argument is related to rebates on exports, not tax on import.
- 21 Under Annex II SCM Agreement it is now permitted for countries to remit taxes on exports, if the taxes are "prior-stage cumulative indirect taxes on inputs". Annex footnote 61 defines these inputs as "physically incorporated, energy, fuels and oil used in the production process and catalysts which are consumed in the course of their use to obtain the exported product". This seems to change how the eligibility of energy taxes for border tax adjustments can be interpreted and may imply that an indirect tax on a production input would be eligible for adjustment if the inputs included energy, fuels or oil that were used or consumed in the production process.
- 22 However, whether footnote 61 clearly allows BTA on energy is the subject of ongoing discussion and could according to Dröge be item to a multilateral understanding.
- 23 See Brack et.al., Biermann and Brohm (2003), OECD (2006), see also Genasci (2008), Hoerner/Muller (1996).
- 24 They point out that Annex II relates to "prior-stage cumulative indirect taxes". However, carbon or energy is taxed only once, at the point of its inclusion in the production process and not – like cascade taxes – once again for the final product. The fact that footnote 61 addresses only the specific case of a prior-stage cumulative indirect tax means that it has quite a limited scope, especially where the prime example, a cascade tax, is no longer found in industrialized countries.
- 25 Mavroidis, EAERE climate conference in Gothenburg July 2008.
- 26 De Cendra, "Can emissions trading schemes be coupled with border tax adjustments? An analysis vis-à-vis WTO Law", Review of European Community and International Environmental Law 15:2, 2006.
- 27 Genasci (2008).
- 28 OECD, Note on the Definition of Taxes by the Chairman of the Negotiating Group on the Multilateral Agreement on Investment (MAI) (DAFFE/MAI/EG/(96)3, 19 April 1996), at. 1.
- 29 Even if the allowance could not be defined as a tax, in case we consider that the government is in fact providing some kind of benefit to the installations because they need the allowances in order to emit carbon dioxide, we still could define it as an unrequited charge.
- 30 Biermann, Wiers, Howse/Eliasson.
- 31 Brewer, Michael Morris, American Electric Power.
- 32 The Ad Note limits border adjustable regulations to any law, regulation or requirement of the kind referred to in Article III.1 GATT. Article III.1, in turn, is limited to "laws, regulations and requirements affecting the internal sale, offering for sale, purchase, transportation, distribution or use of products."
- 33 In these disputes, the panels decided that the US law prohibiting the import of yellow-fin tuna caught with purseseine nets unless the government of the harvesting country proved that its programme regulating dolphin kill rates was comparable to that of the US, violated Article XI GATT.

- 34 See Annex 4.
- 35 Pauwelyn (2007).
- 36 Potts (2008).
- 37 Border Tax Adjustment report of the Working Party.
- 38 Howse and Eliason (2008).
- 39 See fn 36 in Wiers: Quick/Lau "Environmentally Motivated Tax Distinctions and WTO Law: The European Commission's Green Paper on IPP in Light of the 'Like Product'- and 'PPM'-Debates", *Journal of International Economic Law* 2003, p. 419 ff.
- 40 Pauwelyn (2007).
- 41 Pauwelyn (2007), EC-Asbestos, *supra* note 80, at para.100.
- 42 Dominican Republic – Cigarettes and EC – Biotech Products.
- 43 Like this seems to be the case in the French proposal, apparently wishing to influence countries' willingness to engage in international agreement: "from countries refusing to engage...", Wiers, *French Ideas on Climate and Trade Policies*, 2008.
- 44 Wiers (2008).
- 45 See f.ex. Howse/Eliason (2008), Pauwelyn(2007), Hufbauer/Kim(2008).
- 46 The Appellate Body has referred to the "contemporary concerns of the community of nations about the protection and the conservation of the environment".
- 47 Wiers (2008).
- 48 US-Shrimp, *supra*, note 35, para. 136.
- 49 Wiers (2008).
- 50 Speech of WTO representative in Brussels, 15 sept 2008.
- 51 The US in Shrimp – Turtle prescribed how US fishermen should fish shrimps. As it could not directly regulate foreign fishermen fishing in foreign waters, it resorted to making imports dependant on whether countries were certified, an approach the AB accepted.
- 52 Wiers (2008).
- 53 See for example Howse/Eliason, Bhagwati/Mavroidis and Wiers.
- 54 Wiers (2008).
- 55 See Brazil – Measures Affecting Imports of Retreaded Tyres, Report of the AB,WTO DOc. WT/DS332/AB/R.
- 56 Hufbauer/Kim (2008).
- 57 See also Article 3.4 of the UN Framework Convention on Climate Change: "Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change."
- 58 For a more elaborate discussion of advantages and disadvantages of the two alternatives, see Garnaut (2008).
- 59 Stern (2006).
- 60 *Ibid.*
- 61 Summary notes, Copenhagen Seminar on Trade and Climate Change.
- 62 WB (2007).
- 63 For further information on this, see the World Bank (2007).
- 64 The World Bank refers to Baumol and Oates 1988, Copeland 1996, Ludema and Wooten 1994, Mani 1996 and Markusen 1975.
- 65 Brännlund (2008).
- 66 The Carbon Trust (2004), OECD (2006).
- 67 See for instance The Carbon Trust (2004) and Houser et al (2008).
- 68 Houser et al (2008).
- 69 Cosby (2007).
- 70 Reinaud (2005).
- 71 Free allocation refers to the fact that some emissions allowances have been distributed free of charge.
- 72 McKinsey & Company and Ecofys (2006), Carbon Trust (2007) Hourcade et al (2007) referred to by Houser et al (2008).
- 73 World Bank (2007) and the ICTSD (2008).
- 74 OECD (2006).
- 75 See for example the OECD (2006), Cosby and Tarasofsky (2007) and the ICTSD (2008).
- 76 Brännlund (2008).
- 77 See for instance Houser et al (2008), ICTSD (2008) and Brännlund (2008).
- 78 Reinaud (forthcoming).
- 79 Stern (2006).
- 80 *Ibid.*
- 81 OECD (2006).
- 82 Reinaud (forthcoming).
- 83 Conclusion at an expert meeting on climate change in Copenhagen in June 2008.
- 84 Stern (2006).
- 85 ICTSD (2008).
- 86 Reinaud (forthcoming).
- 87 The World Bank (2007).
- 88 *Ibid.*
- 89 Reinaud (forthcoming).
- 90 Garnaut (2008).
- 91 Stern (2006).
- 92 Hufbauer et al (2008).
- 93 Expert statement at a climate seminar in Copenhagen in June 2008.

- 94 Ibid.
- 95 Stern (2006).
- 96 The Economist, June 7th 2008.
- 97 Shui and Harris (2005).
- 98 Wang and Watson (2007).
- 99 Shui and Harris (2005).
- 100 Ravallion (2001).
- 101 The World Bank (2000).
- 102 Statement by expert at a climate seminar in Stockholm organized by Sida in February, 2008.
- 103 See for instance Hufbauer (2008).
- 104 The Times of India, 30 June 2008.
- 105 The Economist, June 7th 2008.
- 106 The CDM is a mechanism available through the Kyoto protocol to allow emission-reduction (or emission removal) projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one ton of CO<sub>2</sub>. These CERs can be traded and sold, and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol.
- 107 It should however be noted that this could raise other concerns, such as compatibility with rules on subsidies.
- 108 OECD (2006).
- 109 Some factors could cause the analysis to overstate the costs of the application of economic instruments. For more details on the limitations of the simulation, see OECD (2006).
- 110 As defined in the Kyoto protocol, see p. 4-5.
- 111 In the complete BTA scenario, exported production is completely exempted from the climate policy. Imports of cement from the rest of the world are taxed in accordance with the CO<sub>2</sub>-intensity of the cement production in the exporting country. In the WTO BTA scenario, exports benefit from a rebate corresponding only to the least CO<sub>2</sub>-intensive technology available on a large scale, and imports are taxed to the same level.
- 112 According to the OECD, the model overestimates the carbon leakage, but the main qualitative conclusions still seem robust. For more details on limitations, see OECD (2006).
- 113 Reinaud refers to Gielen and Moriguchi (2002) and Demailly and Quirion (2007).
- 114 With respect to exports the internal tax imposed on domestic goods can be rebated. According to Article XVI GATT such a rebate shall not be considered a subsidy.
- 115 Summary notes, Copenhagen Seminar on Trade and Climate Change, June 2008.
- 116 Ibid.
- 117 Houser et al (2008).
- 118 Stern (2006).
- 119 Stiglitz (2008).
- 120 Jordan-Korte & Mildner (2008).
- 121 Houser et al (2008).
- 122 See Chapter 3.2.1.

# Annex 1

## Legal Analysis of Border Carbon Adjustment



Source: National Board of Trade

## Annex 2

GATT rules relevant to Border Carbon Adjustment:

- **General Most-Favoured-Nation Treatment (Article I GATT):** According to this principle, any advantage granted by a member to any product originating in any other country must be given immediately and unconditionally to the like product of all WTO members. This requirement is violated if a carbon measure is imposed on the importation of industrial products from a WTO member that does not engage in the post Kyoto regime, while such a measure is not imposed on the “like product” from another state.
- **Tariff obligations (Article II GATT):** Requirement to fix tariff levels, and prohibit tariffs above a particular ceiling. Article II.2.a GATT allows for an exception to the rule of limiting border charges. It draws the line between generally prohibited border tariffs and generally permitted domestic taxes if a competitiveness provision were to take the form of a charge or tax.
- **National Treatment (Article III GATT):** Non discrimination is a core principle in the GATT system. Article III obliges WTO members to grant foreign producers treatment at least as favourable as the treatment granted to domestic like products. It applies to taxation (III.2) and other internal regulatory measures (III.4). The scope of what are “like products” is a central aspect, however not defined in GATT.
- **Environmental Exception (Article XX GATT):** Even though an import restriction on imports violates another GATT article, it might be acceptable if the trade measure conforms to the chapeau of GATT Article XX and falls under one of the subsections. Relevant to climate change, these subsections allow otherwise inconsistent trade restrictions if they are “necessary” to protect human, animal, or plant life or health (Article XX (b)) or if they conserve exhaustible natural resources (Article XX (g)). The chapeau of Article XX requires that these measures not arbitrarily or unjustifiably discriminate between countries where the same conditions prevail, nor constitute a disguised barrier to trade.
- **Prohibition on Quantitative Restrictions (Article XI GATT):** This article requires member states to refrain from imposing quotas, including bans, on imports of products from other member states, except in specified circumstances.

## Annex 3

Rules in the Kyoto Protocol and the UNFCCC relevant to BCA:

- Article 2.3 of the Kyoto Protocol notes that “parties should strive to implement policies and measures...in such a way as to minimize adverse effects, including the adverse effects...on international trade...”
- Article 3.1 UNFCCC notes that the “parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country parties should take the lead in combating climate change and the adverse effects thereof.”
- Article 3.5 of the UNFCCC notes that the “parties should cooperate to promote an...open international economic system” and that “measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.”
- Article 4.2 of the UNFCCC notes that “measures taken to combat climate change, including international ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.”





**Kommerskollegium**  
National Board of Trade

Box 6803, S-113 86 Stockholm, Sweden  
Phone +46 8 690 48 00 Fax +46 8 690 48 20  
E-mail [info@kommers.se](mailto:info@kommers.se) [www.kommers.se](http://www.kommers.se)