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## **A Guide for the Concerned: Guidance on the elaboration and implementation of border carbon adjustment**

*By Aaron Cosbey, Susanne Droege, Carolyn Fischer, Julia Reinaud, John Stephenson, Lutz Weischer and Peter Wooders*

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## ABOUT THE AUTHORS



**Aaron Cosby** is a development economist specializing in the areas of trade, investment, sustainable development, and climate change. He is Associate and Senior Advisor with the Trade and Investment Program, and Associate with the Climate Change and Energy Program, at the International Institute for Sustainable Development, Canada, where he directs the Institute's suite of work on trade and climate change. He has published widely for 20 years in the area of trade and sustainable development, and for more than 10 years in the area of climate change and energy, and has consulted to governments, research institutes, academia, UN agencies, NGOs and IGOs.

His work with ENTWINED includes coordinating the small expert group that produced this guidance

**Carolyn Fischer** is a Senior Fellow at Resources for the Future (RFF). Her research focuses on policy mechanisms and modeling tools that cut across environmental issues, including environmental policy design and technological change, international trade and environmental policies, and resource economics. In the areas of climate change and energy policy, she has investigated the implications of emissions trading program design on cost-effectiveness and emissions leakage, and has conducted research on fuel economy standards, renewable portfolio standards, and energy efficiency programs. In areas of natural resources management, her research addresses issues of wildlife conservation, invasive species, and biotechnology, with particular emphasis on the opportunities and challenges posed by international trade. With RFF since 1997, Fischer has also taught at Johns Hopkins University and was a staff economist for the Council of Economic Advisers to the President. She serves on the Board of Directors of the Association of Environmental and Resource Economists and the Editorial Board of *Resource and Energy Economics*, and is also a Fellow of the CESifo Research Network. She holds a Ph.D. in Economics from the University of Michigan and a B.A. in International Relations from the University of Pennsylvania.



## NON-ENTWINED AUTHORS

*Susanne Droege*, German Institute for International and Security Affairs, Germany, *Julia Reinaud*, Institute for Industrial Productivity, France, *John Stephenson*, New Zealand Institute of Economic Research, *Lutz Weischer*, World Resources Institute, USA, *Peter Wooders*, International Institute for Sustainable Development, Canada (Geneva office).

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## P R E F A C E

# Why did we create this guidance?

Preface by *Aaron Cosbey, Susanne Droege, Carolyn Fischer, Julia Reinaud, John Stephenson, Lutz Weischer and Peter Wooders*

1. We began developing this guidance when, in 2009, the U.S. was actively considering including border carbon adjustment (BCA – fully defined below) as part of a package of climate legislation, and France was openly considering it as an option for the EU in the context of phase III of its Emissions Trading System.

2. As of this writing, neither of these developments seems imminent. However, we assume that BCA will endure as a proposed complement to domestic climate policies, and may eventually feature as part of some countries' climate regimes. Indeed its appeal as policy option has grown for those countries that intend to move forward with domestic climate policy even in the absence of a comprehensive, internationally agreed set of targets and timetables when the first commitment period of the Kyoto Protocol has come to an end in 2013. As of this writing 34 countries have emissions pricing in place, or plans to implement it.

### 3. This guidance is intended to:

- Help policy makers decide on an informed basis whether to adopt BCA, by exploring some of the non-obvious complexities;
- If they do decide to adopt BCA, help policy makers avoid adverse outcomes to the extent possible when elaborating and implementing the BCA regime, and;
- Help exporting nations critically assess schemes under which they might be targeted.

4. Our aim is that BCA should be formulated and carried out in a manner that is effective in reducing global GHG emissions,

effective in achieving its intended goals at the national level, transparent, and coherent with the principles of the multilateral system of trade, the principles of the multilateral climate change regime and other internationally agreed principles and objectives.

5. We provide this guidance without making any judgments as to the desirability of BCA. We note at the outset that BCA is at best a fall-back measure in the event of collective failure at the international level to define appropriate levels of national action. At worst BCA can be a coercive, divisive and highly imperfect policy tool with serious methodological challenges. While this guidance does not measure BCA against policy alternatives— such as free allocation of allowances, sectoral tax preferences, exclusion of sectors from climate policy, international sectoral agreements, GHG intensity standards, or bilateral or regional accords—we recommend that it be judged against a full set of alternatives to meet the prescribed goals.

6. The guidance begins by setting out starting points: defining what we mean by leakage and competitiveness; setting out what we see as the three basic motivations for using BCA; and describing a set of criteria that will be used to evaluate regime options at a number of points in the guidance. It then critically assesses the three enunciated motivations for BCA. It next explores how to identify those domestic sectors that should be covered by a BCA, followed by a focus on what countries should be covered. It then explores how to determine the appropriate level of adjustment, and what to do with the collected revenues. It then offers guidance on adjustment for exports, and in closing describes the governance structures that should be in place to ensure fair practice in the application and elaboration of BCA regimes.

## SUMMARY OF RECOMMENDATIONS

### MOTIVATIONS:

Policy makers should be explicit about their motivations, which could be any or all of: preventing leakage, preserving competitiveness or exerting leverage. (para 12)

Of these three possible motivations, preventing leakage is the only motivation we recommend for the use of BCA; it is ultimately an environmental motivation, concerned with making domestic climate policies effective. (paras. 13 – 24)

### SCOPE OF APPLICABILITY:

#### Exemptions

Despite the fact that any national exemptions will face conflicts with the trade law principle of MFN, we recommend the following exemptions from coverage by any BCA regime: (paras. 26-36)

- Exemptions for countries adhering to a multilateral agreement on climate change to which the implementing state is also party;
- Exemptions for countries with an effective national emissions cap, and for sectors with an effective sectoral cap (accompanied by trans-shipment provisions);
- Exemptions for LDCs and LICs *if it could be assured that this would be carved out by the WTO's Enabling Clause*;
- Calibrated credit (as opposed to outright exemptions) for exporting country national or sectoral actions in the case of price-based regimes, to be further described below as *modifications to the adjustment level*, but no credit or exemptions for non-price based actions, these being simply too administratively difficult.

The need for trans-shipment provisions necessitates a high threshold of applicability that probably excludes manufactured goods and covers only a small number of commodities. (para. 37)

#### Goods and sectors covered

BCA should only be used as a complement to implementing country price-based policies: cap & trade, and carbon taxes. (para. 41)

Balancing off the need to avoid leakage (which argues for broad coverage) against the costs, the declining returns to those costs, the legal issues and other problems (which argue for narrow coverage) leads us to recommend a regime situated the narrow end of the spectrum. (paras. 38-39)

Two criteria should be used to determine which goods and sectors should be covered, both being necessary conditions:

- Vulnerability to high costs from climate regulations (use as a proxy: GHG intensity)

- Inability to pass on costs to customers (use as a proxy: trade intensity)

### LEVEL AND TYPE OF ADJUSTMENT

#### Assessing the carbon content

##### *System boundary:*

Within the system boundary should be included: scope 1 emissions (direct emissions, including process emissions) and scope 2 emissions (emissions from electricity, heat or steam generated off site). Other indirect emissions should not be included. Emissions from transport to market, from consumption and disposal of goods, should also not be included, (paras 44-54)

Energy-related by-products exported off site (e.g., exported electricity) should be treated like energy imports, creating indirect emission credits, but there should be no crediting for non-energy-related exports (e.g., material by-products used in other production processes). (para 50)

##### *Benchmarks (paras. 55-64)*

If exporters are unable or unwilling to provide third-party verified data to a protocol or standard specified by the implementing country, benchmarks should be used.

In the first instance, producers should be given the option to provide third-party verified firm-level data on emission intensity, using the same system boundaries used for implementing country producers. Only when that is not forthcoming should benchmarks be used as a fallback

The benchmarks developed should be product-specific, and also where necessary specific to different production processes. In principle, it is preferable to have only one benchmark for any given product, but where a product has significantly different technologies in use (in terms of GHG intensity, abatement options), more than one benchmark may be needed.

For scope 1 emissions (direct emissions), the benchmarks should use average emissions intensity in the implementing country. This option offers reasonable protection against leakage, but because it is only employed where firms have declined to report actual emission data it is not punitive, and offers some incentives for good practice.

We strongly recommend that implementing states offer support, in the form of financial and technical assistance in accounting, reporting and verification, to assist foreign covered exporters in submitting verified individual data.

For scope 2 emissions (energy, steam and heat generated off site) the benchmarks should use average data from the exporting countries. Fairness dictates that producers who use on-site-generation, who would otherwise have to use importing country average practice as a benchmark, should have the option to

calculate their energy-related emissions using the same exporting country average benchmark used for scope 2 emissions.

#### *The data (para. 65)*

The data submitted by producers should be measured and reported to a specified protocol and verified by a third party.

International standards and protocols should be used, where available, in the submission of data and in the construction of benchmarks.

#### **Modifications to the adjustment level (paras. 66-69)**

Credit should be granted for price based climate policies (e.g., cap and trade, carbon tax, carbon-related export tax) in the exporting country, either at the national level or at the sectoral level. An agreement would have to be negotiated between the two states involved that was analogous to an equivalency agreement on standards in traded goods, or a linking agreement between distinct emissions trading systems, or a bilateral taxation treaty. The agreement would establish the level of credit the regime in the exporting country would receive for its climate policies, and determine how much the border adjustment would be lowered as a result. As with the exemptions described above, any system of calibrated credit would need to be accompanied by provisions to prevent trans-shipment.

Any free allowances or other compensatory mechanisms to shelter implementing country firms need to be taken into account when calculating the amount of adjustment due. Depending on the regime, this might mean that the level of BCA is adjusted down to zero.

Special benchmarks or credit calibrations could be developed for less developed exporting countries (if they are not exempt), to respect the principle of CBDR. Any special treatment or exemption would have to be accompanied by trans-shipment provisions.

#### **Type of adjustment (para. 70)**

Adjustments need not be in the form of levies. An alternative, for example, would be to allow importers or foreign producers to purchase international carbon offsets up to the determined value of adjustment.

#### **Pricing the carbon content (paras. 71-72)**

The carbon price paid by exporting country firms should be based on the price paid by implementing country firms. If the implementing country uses a carbon tax, the carbon price for the exporting country firms' adjustment should be at the level of the tax (perhaps with prices determined at regular intervals to avoid unpredictable and significant changes). If the adjustment is a requirement to buy into a cap and trade regime, the exporting country firms should be regulated such that they come as close as reasonably possible to purchasing allowances on the same terms offered to their competitors in the implementing country.

#### **THE APPLICATION OF BCA TO EXPORTS**

We do not recommend the use of export adjustment in BCA regimes. (paras. -73 - 81)

#### **USE OF REVENUES FROM IMPORT ADJUSTMENTS**

To help any BCA regime better respect the principle of CBDR, and to help its chances of success in the event of a trade law challenge, we recommend that one or more of the following occur in any BCA regime: (paras. 82 - 85)

- Refund any adjustments collected to the exporting country, either directly or to subsidize clean technology transfer;
- Contribute adjustments collected to internationally administered funds for climate change mitigation and/or adaptation;
- Designate funds collected to be disbursed by the implementing state in ways that benefit developing countries (e.g., finance for mitigation and adaptation projects).

#### **OTHER DESIGN GUIDANCE**

##### **Pre-establishment guidance (paras. 87-88)**

Trading partners should be notified of BCA proposals at an early stage, with draft text distributed to them on request. There should be opportunity for exporting countries and firms to present their comments in writing. These should be discussed upon request, and the written comments and the results of these discussions should be taken into account in the final regime design.

Entry into force of any BCA regime should give exporters and exporting country governments enough lead time to adjust their policies and practices.

##### **Operational guidance (paras. 89 - 93)**

An official point of contact should be designated to respond to questions and requests for documents from exporting countries and firms.

The decision-making process should be predictable and transparent, with methodologies for determining vulnerable sectors, level of adjustment and country-level applicability, for example, being public information.

Calculations with respect to individual countries and exporters should be regularly reviewed and revised where necessary. The parameters of the regime should also be regularly reviewed – at least on an annual basis. Exporting countries and firms should be able to make submissions to the review processes.

There should also regular review of BCA regimes aimed at assessing their effectiveness in meeting their stated objectives.

There should be mechanisms within the BCA regime whereby exporting countries and firms can appeal decisions and calculations that concern them.

##### **Sunset guidance (para. 94)**

The measures should be time limited and should have clear conditions for phase-out. BCA should only be intended to offer temporary effect during a period of transition to a low-carbon economy and broader international cooperation. At a minimum, the continued application of BCA should be contingent on explicit criteria related to the state of progress in achieving a low-carbon economy, and in achieving international cooperation on climate change action.

## GLOSSARY OF TERMS AND ACRONYMS

<b>BCA</b>	Border carbon adjustment
<b>Benchmark</b>	In a BCA regime, a benchmark is an assumed level of GHG-intensity, assigned product by product.
<b>Cap and trade</b>	A regime that caps the allowed emissions of GHGs, and allows trading of allowances among covered entities.
<b>Carbon</b>	Used in this text as shorthand for carbon dioxide, the most prevalent GHG
<b>CBDR</b>	Common but differentiated responsibility
<b>Direct emissions</b>	Emissions derived from sources owned or controlled by the reporting entity
<b>EITE</b>	Energy-intensive trade-exposed (firm or sector)
<b>Enabling Clause</b>	A WTO provision that exempts some forms of preferential developing country tariff treatment from MFN obligations
<b>ETS</b>	Emissions trading system
<b>GATT</b>	General Agreement on Tariffs and Trade
<b>GHG</b>	Greenhouse gas
<b>Indirect emissions</b>	Any emissions from sources not owned or controlled by the reporting entity, such as from purchased electricity
<b>LDC</b>	Least developed country
<b>Leakage</b>	Any increase in GHG emissions in foreign jurisdictions that results from climate policies taken in an implementing jurisdiction (calculated as the change in foreign emissions divided by the change in domestic emissions)
<b>LIC</b>	Low-income country
<b>MFN</b>	Most-favoured nation treatment: a principle of trade law prohibiting discrimination among like goods on the basis of their country of origin
<b>S&amp;DT</b>	Special and differential treatment
<b>Scope 1 emissions</b>	All direct emissions
<b>Scope 2 emissions</b>	Energy-related indirect emissions: those arising from purchased electricity, steam or heat
<b>Scope 3 emissions</b>	All indirect emissions not covered under scope 2
<b>TBT Agreement</b>	WTO's Technical Barriers to Trade Agreement
<b>Trans-shipment</b>	The shipping of goods from the original exporter through third countries to take advantage of preferential trade status in those third countries
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>VAT</b>	Value-added tax
<b>Waxman-Markey</b>	A climate bill passed by the US House of Representatives in 2009 (H.R. 2454) that contained BCA provisions
<b>WTO</b>	World Trade Organization

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## 1. STARTING POINTS

### WHAT IS BCA?

7. A border carbon adjustment is a measure applied to traded products that seeks to make their prices in destination markets reflect the costs they *would have* incurred had they been regulated under the destination market's greenhouse gas emission regime.<sup>1</sup> The adjustment can be applied either to imports or to exports. In the case of imports the charge would reflect the GHG emissions associated with imported products and the price of emissions faced by comparable products in the destination market. If applied to exports the adjustment would be a rebate of emissions charges levied in the country of origin. In a seamless system of globally applied BCA this would be followed by border adjustment in the destination market, with the objective that all products in their destination markets should reflect domestic emissions prices. This is the same arithmetic that guides VAT and excise duty adjustments at the point of import and export, though BCA is considerably more complex, as described below.

### WHY APPLY BCA?

8. The key possible motivations behind BCA are:

- **Reducing risks of leakage.** Leakage is an increase in GHG emissions in foreign jurisdictions that results from climate policies taken in an implementing jurisdiction (see Box 1). Leakage can also be conceived as an increase in emissions in a foreign productive sector that results from climate policies imposed on a competing sector in the implementing country. In this guidance, "leakage" refers to the former definition (sometimes called national-level leakage). Where the latter is meant, it is referred to as sectoral leakage.
- **Maintaining industry competitiveness.** Related to leakage, but distinct, this motivation is concerned about the loss of profits, market share, production, investment and related jobs. Those losses could be due to industry relocating to jurisdictions with lower costs of compliance, to industry losing market share to firms from such low-cost jurisdiction, or to diversion of new investment to those same jurisdictions.
- **Leverage.** BCA, or the threat of BCA, might be used to bring pressure on other countries to adopt policies to reduce GHG emissions.

9. These three options are assessed and further described in the section that follows: *Motivations*. At this point, we note that competitiveness and leakage concerns can be addressed in a number of ways. Best among these is broad-based international agreement on the acceptable levels and/or means of effort to address climate change. Indeed, global action to reduce carbon emissions is the only mechanism that can address all of the leakage channels, including leakage related to global fossil fuel market responses. But in the absence of that ideal, other climate policies will be pursued at the national level, such as carbon taxes, cap-and-trade schemes and other carbon constraints.<sup>2</sup>

10. The competitiveness and leakage issues that such national policies engender can be addressed through a variety of means, including special treatment to vulnerable sectors (e.g., free allocation of allowances, preferential tax treatment, or even wholesale exclusion from the climate policy), international sectoral agreements (under which one or more countries agree to regulate sectors in a similar coordinated manner), GHG intensity standards, bilateral or regional accords, or BCA. Each of these policy options has many possible permutations, and each has its inherent strengths and weaknesses. It is beyond the scope of this guidance to go into detailed comparison of the various options that compete with BCA to address competitiveness and leakage concerns, but those options should be carefully assessed by any government considering the use of BCA.

### BOX 1: THE MECHANICS OF LEAKAGE

Leakage can occur via any of at least three distinct channels:

- Through the relocation of existing economic activity to countries with lower costs of regulation (either through plant relocation or through domestic firms losing market share to firms with lower costs of regulatory compliance);
- Through the diversion of new investment from the regulating country to countries with lower costs of regulation;
- When regulation forces price changes that increases emissions in other countries (for example, regulations might lower domestic demand for fossil fuels, lowering the global price, increasing demand elsewhere).

This last channel is not considered in this guidance; BCAs have not been proposed as a way to deal with this sort of leakage.

## CRITERIA FOR JUDGING BCA REGIME OPTIONS

11. Throughout this guidance we will assess various regime design options on the basis of a consistent set of criteria. They are:

- **Environmental effectiveness:** Does the regime work to reduce GHG emissions at a global level?
- **Policy coherence:** Is the regime consistent with the multilaterally agreed principles and objectives of international trade and investment law, of the international climate regime, or of other international agreements or commitments?
- **Feasibility:** Is the regime cost effective, and does its implementation impose a reasonable administrative burden?
- **Good governance:** Would the regime be implemented in accordance with commonly accepted governance principles such as transparency, predictability, ease of use and procedural fairness?

## 2. MOTIVATIONS

12. We noted above that there were at least three possible motivations for the use of BCA. A first piece of guidance is that policy makers should be explicit about their motivations, since the design of any BCA regime will be different in important respects if it is aimed at one or another of these motivations (as will be demonstrated below).

13. A second piece of guidance is that preventing leakage is the only motivation we recommend for the use of BCA. Preventing leakage is ultimately an environmental motivation, concerned with making domestic climate policies effective. Even if *domestic* climate policies are cast narrowly as targeting domestic emissions reductions, leakage can undermine the ultimate goals since GHG emissions are equally damaging no matter where they occur.

### Leakage

14. We define leakage as any increase in greenhouse gas (GHG) emissions in foreign jurisdictions that results from climate policies taken in an implementing jurisdiction.<sup>3</sup> Leakage is an issue for environmental policy-makers who fear that it might undermine the environmental effectiveness of their regulations.

15. Leakage can occur whenever foreign emissions are not capped, either explicitly by a cap-and-trade policy or by a hard national target. For example, in countries with carbon taxes, national emissions change in response to economic changes, so emissions can technically “leak” even to such countries. On the other hand, hard caps—even weak ones with low associated carbon prices, or firm national targets under which some sectors remain unregulated—mean that overall emissions in that country cannot expand, regardless of the actions of other countries. This assumes, of course, that the cap is *effective*; there are many formulations of emissions caps—for example with offsets, price collars, intensity caps, etc.—that would in fact allow for leakage.

16. It is worth noting that national-level leakage differs from sector-level leakage, which is more related to competitiveness effects. A country with a national emissions cap can still experience

leakage in a specific sector as long as emissions in other sectors shrink to respect the cap. From an environmental effectiveness perspective, though, this is unimportant since global emissions will not have increased.<sup>4</sup>

### Competitiveness

17. Preventing loss of competitiveness is a purely economic concern -- concern for the effects of carbon regulation on trade-sensitive sectors. Part of this motivation is related to the job loss that would be associated with the relocation of economic activity through trade, which can be especially pronounced in certain energy-intensive trade-exposed (EITE) sectors. Another motivation for addressing sector-level competitiveness concerns is to shore up political support (or defuse political opposition) from powerful special interests, labor groups, and elected representatives from industrial communities. It can thus be argued that preserving competitiveness, as a precondition for the domestic political acceptability of stringent economy-wide climate policy, can contribute to the global goal of emissions reductions.

18. However, we see preserving competitiveness as an inappropriate motivation for BCA for two main reasons. First, competitiveness motivations often predate climate policy, as many of the major EITE manufacturing sectors already operate in the context of economic trends that foresee continued shifts away from industrialized to emerging economies. Responding to these motivations through BCA would thwart legitimate economic drivers of comparative advantage and trade. There is an important difference between such responses and responses aimed at mitigating the changes associated with the climate policy, though the latter may well have implications for competitiveness.

19. Second, preventing the loss of competitiveness is not a valid rationale for breaching trade law obligations (see Box 2). The international community has agreed in World Trade Organization (WTO) law and in various free trade agreements that while there are some legitimate objectives—including protection of plant, animal and human life and health, and conservation of scarce natural resources—that can over-ride other trade law obligations, preserving competitiveness is not one of them. BCA as an instrument has an uncertain status under trade law, and in the end regime design would be critical to any final determination. Motivation would be one of the key deciding features.

### Leverage

20. The leverage motivation reflects a desire to use BCA to pressure other countries to take actions to reduce their emissions. The most obvious form this might take is a demand for participation in a multilateral agreement such as the UNFCCC, but it might also take the form of demanding a carbon price, for example. Leverage as defined here is strictly about trying to change exporting country national policies, as opposed to trying to change exporting firm-level behaviour.

21. We see leverage as an inappropriate motivation for BCA. For one thing it may be ineffective. In many cases the export stream for a product is a small percentage of total country-level production, meaning limited impact at the sectoral level, and so limited



## BOX 2: BCA AND WTO LAW

There are two key aspects of WTO law that are most relevant to border carbon adjustment: non-discrimination under the General Agreement on Tariffs and Trade (GATT) and subsidy law under the Agreement on Subsidies and Countervailing Measures (SCM).

The former dictates that imported goods must be treated no worse than “like” domestic goods (national treatment: Article III:2), and that there should be no discrimination among “like” goods on the basis of country of origin (MFN: Article I:1). GATT also contains a carve out from these requirements in Article XX (General Exceptions), which allows discrimination for a number of agreed purposes, including one that is particularly relevant for climate change protection: the conservation of exhaustible natural resources. However, Article XX also includes (in its chapeau) some general requirements for policy that must be met regardless of the validity of the exemptions, including the requirement that a measure does not represent “arbitrary or unjustifiable discrimination between countries where the same conditions prevail” or a “disguised restriction on international trade.” The chapeau tries to ensure that Article XX is available for legitimate environmental measures, but not for protection against competitiveness impacts.

With respect to import adjustment, the implications are that BCA cannot discriminate on the basis of country of origin; it cannot have, for example, exemptions based on national policies or practice. And it cannot discriminate between foreign and domestic goods that are “like,” with carbon-intensive and low-carbon goods almost certainly being considered “like.” Any permutation of BCA will fail the latter test, so the legal questions would then centre on whether the regime passed the strictures of Article XX. The details of the scheme in question would be key, and while definitive guidance is impossible, case law gives us some strong indications:

- The regime would have to focus only on preventing leakage (i.e., an environmental goal), and not on preserving competitiveness.
- It would very likely have to be preceded by *bona fide* attempts at negotiating a multilateral solution.
- It would probably have to allow individual foreign producers to produce their own actual data, to challenge any benchmarks imposed.
- And it might have to allow exemptions to countries that had taken climate action comparable in effectiveness to domestic action.

Subsidy law in the WTO outright prohibits certain types of subsidies (e.g., those that are linked to export promotion) and allows challenges to other subsidies, focused on determining whether they cause harm to foreign producers. Border carbon adjustment applied to exports would be a prohibited export subsidy if the rebate were in excess of the costs borne by goods destined for domestic consumption. But there is no legal consensus (or even strong opinion one way or the other) on whether all export adjustment would constitute prohibited subsidies under SCM rules; it depends on whether the domestic scheme (whether a tax, a cap and trade or some other regulations) is considered legally an indirect tax. Such taxes, of which VAT is an example, can be legally adjusted for at the point of export, but direct taxes (such as payroll taxes) cannot, and carbon taxes fall into a legal grey zone in between.

leverage to affect national policies. Also, it is possible that BCA as a coercive lever may backfire; the tool is so controversial and divisive that it may actually impair efforts to achieve multilateral climate agreement, rather than impel progress, meaning a missed opportunity for mitigation. The intense controversy surrounding the EU’s aviation emissions levy, which strongly resembles a BCA, testifies to that, as do a number of WTO disputes over unilateral extrajurisdictional action.<sup>5</sup> Trade has also become a problematic area in the climate negotiations, in part fuelled by concerns about the potential use of BCAs. Some argue that this political energy is precisely what “works” in motivating target countries to take action on climate change. The question is whether the net impact is positive or negative from an environmental perspective, and from the perspective of wider multilateral cooperation.

22. A particular difficulty in using BCA for leverage is the potential conflict this creates with the UNFCCC principle of common but differentiated responsibility and respective capabilities (CBDR), which recognizes that developing countries should not be expected to implement the same kinds of policies as developed countries. As discussed in Box 3, BCA aimed at national policies (e.g., BCA motivated by leverage) is more likely to be in conflict with CBDR than BCA aimed at the practices of producers. The latter type of BCA (motivated by competitiveness and leakage objectives) may also conflict with CBDR, but there are ways to construct such regimes so as to lessen the conflict. That is, the conflict in those cases is not so fundamental.

23. Legitimizing leverage as a motivation for BCA could open the door to sanction-like actions. That is, tariffs could conceivably be applied to goods with no carbon footprint at all, in an effort to inflict enough economic pain to impel “adequate” climate policies in the exporting countries. Or BCA could be applied in a fashion that deliberately overcharges exporters, seeking not only to level the playing field, but actually to add a punitive element to the adjustment. This sort of leverage uses BCA as a weapon – an exercise that we do not recommend, given its powerful ability to spark the kind of friction discussed above, and its violation of the principles of multilateral cooperation. BCA applied as described below—to goods that have potential for leakage, and in a good faith effort to estimate an appropriate carbon price—also has leverage characteristics, but no more so than do existing product standards which demand that producers change their production methods if they want to access the implementing state market. Such an exercise seeks not to necessarily change national policies, but rather to prevent leakage to specific firms in exporting countries, and thus by our definition is not motivated by a desire for leverage.

### A pragmatic caveat

24. Most policy making processes are, of necessity, exercises in balancing a number of different policy objectives. As such, in the real world it is unlikely that any BCA regime might be elaborated so as to fulfil only one of the motivations described above. Nonetheless, to the extent possible, the guidance that follows tries to make recommendations that assume preventing leakage (i.e., preserving environmental effectiveness) is the policy makers’ only motivation.

### BOX 3: BCA AND COMMON BUT DIFFERENTIATED RESPONSIBILITY

Common but differentiated responsibility (CBDR) is a principle that is operationalized in many multilateral environmental agreements, including the UNFCCC, Article 3 of which says that: “parties should protect the climate system for the benefit of future and present generations of human kind on the basis of equity and in accordance with their common but differentiated responsibility and respective capabilities.” CBDR affirms that while addressing environmental issues like climate change is a common responsibility of all nations, some should take stronger actions than others.

The justification for differentiated responsibilities on climate change is twofold: first, those that have most heavily contributed to (and benefited from) the accumulation of atmospheric GHG emissions have a greater burden of responsibility; second, those that have greater capability to address climate change, by dint of greater wealth, access to technology, etc., should contribute more.

BCA faces potential conflicts with CBDR, since it can be perceived as attempting to achieve similar regulatory burdens for firms from both exporting and implementing countries – a levelling of the playing field (though it can also be argued that BCA is intended to bring regulatory consistency to *consumers* of emissions-intensive products, who reside in nations with greater responsibility for action).

One of the reasons multilateral agreements such as the UNFCCC are so preferable to unilateral action such as BCA is that the former can find international consensus on an “uneven field” – a distribution of different national burdens in addressing climate change (as in the Kyoto Protocol). By contrast, BCA as currently contemplated involves a unilateral determination.

Does all BCA conflict with CBDR? CBDR in the UNFCCC defines the rights and responsibilities of the Parties, which are nation states. As such, any BCA that aims to bring about equivalent national policies (e.g., with exemptions based on equivalent national policies) will probably violate CBDR. The story is different for BCA focused on the practices of individual producers (e.g., regimes with no national policy-based exemptions), to which the UNFCCC confers no legal rights. But there is no clear distinction on which we have consensus; it can be argued that if regulations applied to exporting country producers make the exporting country worse off, the result is still a violation of CBDR (Müller 2012).\*

There are elements of any BCA regime that might move it in the direction of respect for CBDR. These include national exemptions and provisions for revenue refunds, based on historic responsibility and/or on national capability.

\* Müller, Benito. 2012. “From Confrontation to Collaboration: CBDR and the EU ETS aviation dispute with developing countries.” Oxford Energy and Environment Brief, Oxford Institute for Energy Studies.

## 3. SCOPE OF APPLICABILITY

25. The scope of a BCA’s applicability determines which products or sectors the regime will cover, and which countries. We will first discuss what exemptions from coverage should be in place, both at the country level and at the product/sector level. We will then discuss how to identify, from among those products and sectors not exempted, which should be subject to adjustment.

### EXEMPTIONS

26. Exemptions are defined categories of goods or exporting countries to which the BCA does not apply at all. (Exemptions are thus distinct from adjustments to the BCA rate, as exemptions not only effectively set the rate to zero but they eliminate the need for compliance measures).

27. Any national-level exemption raises two concerns. One is potential incompatibility with GATT’s Article I obligation for MFN treatment, which requires that no nation be favoured above any other in the treatment of imported goods (see Box 2). The question then is whether the exemption might be justified under GATT’s Article XX, which allows states to take otherwise-illegal measures that are aimed at, among other things, genuinely protecting the environment. The other concern is trans-shipment problems (see Box 4). Strong provisions would be required to ensure that any products coming from the exempted country had in fact undergone a substantial transformation there. Otherwise it would be possible for non-exempted countries to ship products there for re-export, in an attempt to avoid coverage. Trans-shipment provisions would make administration of the regime significantly more complex.

28. A number of possible exemptions are commonly considered for a BCA regime. They include exemptions for:

- Parties to a multilateral climate change agreement;
- Countries taking adequate action: national cap on emissions;
- Countries taking adequate action: national action other than emission cap;
- Sectors from countries taking adequate action: cap or equivalent on specific sector;
- Least-developed countries (LDCs) and low-income countries (LICs);
- Countries exempted by administrative discretion.

29. Each of these can be examined in light of the criteria identified above for judging BCA regimes (see para. 11). The result is illustrated in Table 1, with more in-depth discussion following.

30. *Exempting countries that are party to a multilateral agreement on climate change to which the implementing state is party.* This is in essence a use of BCA for leverage purposes, with the drawbacks argued above: primarily that it could backfire and make international agreement less likely. On the other hand, not employing this exemption would presumably involve violating the principle of CBDR (see Box 3) as operationalized by the multilateral agreement in question; it would involve demanding more than is demanded by the treaty’s multilaterally agreed allocation of burdens. As such it could be argued that this exemption, while it amounts to leverage, actually *lessens* the potential for international political friction. This exemption, like any national-level exemption, raises issues with MFN treatment and

**Table 1: Options for exemptions from coverage**

EXEMPTIONS	ENVIRONMENTAL EFFECTIVENESS	FEASIBILITY	POLICY COHERENCE	GOOD GOVERNANCE
Party to multilateral agreement	leakage possible	difficult to define what is an adequate agreement, who is in compliance	creates problems with GATT MFN obligation; probably saved by Art. XX	
	risk that “leverage” may backfire; need trans-shipment provisions		not using such an exemption creates conflicts with CBDR	
Adequate action: National emissions cap	no risk of overall leakage (though sectoral leakage possible)	if equivalent action allowed, difficult to calculate effects	creates problems with GATT MFN obligation; could be saved by Art. XX	
	need trans-shipment provisions			
Adequate action: Other than national emissions cap	Leakage possible	difficult to define what is adequate action; would need to cover only price-based climate policies	can be defined so as to respect CBDR, S&DT	lack of predictability stems from difficulty defining adequate action
	need trans-shipment provisions		creates problems with GATT MFN obligation; could be saved by Art. XX	
Sectoral emissions cap	no risk of (sectoral) leakage	if equivalent action allowed, difficult to calculate effects		
	need trans-shipment provisions			
LDCs and LICs	probably minimal impact from exempting them	fewer countries makes administration simpler	creates problems with GATT MFN obligation	
	need trans-shipment provisions		creates coherence with CBDR, S&DT	
Exempted by administration (country-level)	uncertain impacts - depends on amount of emissions covered; needs trans-shipment provisions	fewer countries makes administration simpler	creates problems with GATT MFN obligation	lacks predictability, transparency

would need to be accompanied by strong trans-shipment provisions (see Box 4). This exemption would also require a definition of an adequate multilateral agreement, and perhaps even some definition of countries’ compliance with that agreement. This and the trans-shipment provisions would increase administrative complexity.

**31. *Exempting countries that implement a national emissions cap.*** If a country has an effective national cap, it is by definition impossible for there to be leakage, so this is a globally effective exemption. Even if there is leakage at a sectoral level – some production shifts to the exporting country – the associated increases from the sector will have to be compensated by reduced emissions from some other sector to maintain the cap (provided that the cap is set low enough to be actually limiting), so global emissions do not rise. This assumes, as noted in paragraph 15, that the cap is *effective*; there are many formulations of emissions caps that would in fact allow for leakage. As with the previous national-level exemption, this exemption would require strong trans-shipment provisions, somewhat increasing administrative complexity. Because it is a national-level exemption, this exemption creates problems with GATT’s Article I obligation for most-favoured-nation treatment, but it might be justified under GATT’s Article XX. This is because there is such a strong relationship between the defining national characteristic (an emissions cap) and the environmental objective (preventing leakage).

**32. *Exempting countries that take “adequate” national actions, other than national caps.***<sup>6</sup> Any national climate regime other than a cap is susceptible to leakage. This exemption raises similar issues to that of exempting countries party to a multilateral agreement, and more. It is administratively difficult and potentially lacks predictability, because of the challenge of defining ex ante what constitutes adequate action. For example, how high would a carbon tax have to be, and what coverage would be needed, in order to qualify?

Defining an “adequate” cap and trade scheme would be even more challenging, given the myriad permutations of such schemes. And giving credit for other actions, such as renewable energy support, would be so complex as to be unworkable.<sup>7</sup> But most challenging is dealing with non-price-based mechanisms. Ideally the exemption would not be a pass/fail threshold, but would give partial credit for actions that are significant but less than “adequate”; this would help make any measure better align with trade law obligations.<sup>8</sup> But in most cases this ideal would be too difficult to put into effect. In certain cases it could work, though; carbon taxes could be calibrated to account for the difference in price levels across two different regimes, and different emissions trading systems may succeed, albeit with considerable difficulty, at agreement on equivalence. But with non-price-based mechanisms partial credits would be so complex as to be unworkable. A strong advantage to this exemption is the ability to use it to bring the BCA regime into greater coherence with the principle of CBDR (and the trade law equivalent: special and differential treatment (S&DT)). This would involve somehow defining adequacy as less than the level of effort expended in the implementing country. This exemption would create problems with GATT’s MFN provisions, since it distinguishes at the national level, but if properly designed it might be saved by GATT’s Article XX exceptions. This exemption would require strong trans-shipment provisions.

**33. *Exempting sectors from countries that implement a sectoral cap.*** If a country caps the emissions from a given sector, this assures that no leakage will take place with respect to that sector. As with a national-level cap, the assumption is that the cap is effective. If the exporting country takes actions that are *equivalent* to a sectoral cap, such as taxes on the exports from that sector, counting such actions adds a level of administrative complexity since equivalence would

#### BOX 4: BCA AND ORIGIN DETERMINATION

Any BCA regime which seeks to exempt goods on the basis of country of origin will need rules for determining product origin, lest goods be shipped to an exempt country and then re-exported (trans-shipped) in order to skirt coverage. This determination may be complex, depending on the product in question.

At the simple end of the spectrum are products which are “wholly obtained” in a particular country. This might include products such as steel where production is unlikely to occur in more than one country. No new rules would need to be developed to deal with these products.

Products that have been produced across more than one country will be much more difficult to deal with. For these kinds of products, origin determination is normally based around the idea of last “substantial transformation”, although a range of different and detailed rules are used in practice. In practice, rules of origin are based on one of three criteria:

1. Changes to the essential character of a product, often measured by the shift of a product from one tariff classification to another.
2. Value added rules, where a minimum level of value must be added in a country before that country can be conferred origin.
3. Technical processes, where a specific manufacturing process or addition of product component is defined as either conferring or not conferring origin.

It is not clear which of these criteria would work best for BCA. In principle, to guard against leakage there may need to be a new “emissions added” criteria, which confers origin on the basis of where the majority of emissions were created during the production of a product. This would, however, impose new and potentially significant transaction costs on traders who will have little experience tracking embodied emissions through supply chains. Moreover, existing evidence on the take up of trade preferences with rules of origin requirements suggests that large numbers of traders would choose to face a BCA rather than bear the cost of proving origin.

have to be calculated. As with the national exemption for adequate action, however, it is possible to imagine exemptions or adjustments that account for *price-based* regimes in the country of export. This exemption, like the national-level exemptions, would need to be accompanied by strong provisions on trans-shipment, in this case just covering the sector in question. There is no trade law problem with non-discrimination here, since the discrimination is based on sectoral characteristics, rather than on country characteristics.<sup>9</sup>

**34. *Exempting LDCs and LICs.*** An exemption for LDCs and LICs would help bring the measure into policy coherence with the UNFCCC principle of CBDR, the WTO principle of special and differential treatment (which is not well defined from a legal perspective), and with other international commitments on development such as the Millennium Development Goals and the Rio Principles.<sup>10</sup> It is not clear, however, that such an exemption would have much palpable impact, since almost none of these countries export the type of goods that are targeted by BCA (see Box 5). Moreover, this exemption being a national-level exemption,

it creates problems with MFN treatment. It might be carved out by the WTO’s Enabling Clause, which exempts some forms of special developing country tariff treatment from MFN obligations, but that is unlikely. The Enabling Clause applies to discriminatory trade measures that have as their objective development in the target countries—a tough bar to clear for any BCA regime. Moreover, it specifically does not cover those measures that “raise barriers to or create undue difficulties for the trade of any other [i.e., non-exempted] contracting parties.”<sup>11</sup> This sort of exemption would need to be accompanied by trans-shipment provisions.

**35. *Exempting countries by means of administrative flexibility.*** This would involve the ability of the implementing government at some level to decide to exempt certain countries from coverage, presumably as a result of considering broader public policy objectives. The larger the volumes of trade exempted, and the more intense the GHG production implicated, the greater the impact. Because it would have to focus on the national level this exemption would face problems of conflict with the GATT’s MFN provisions, and would need to be accompanied by strong trans-shipment provisions. This exemption lacks the predictability that should be the hallmark of any scheme.

**36.** Given the forgoing analysis, we recommend the following exemptions be featured as part of a BCA regime:

- Exemptions for countries adhering to a multilateral agreement on climate change to which the implementing state is also party.
- Exemptions for countries with an effective national emissions cap, and for sectors with an effective sectoral cap (accompanied by trans-shipment provisions);
- Exemptions for LDCs and LICs *if it could be assured that this would be carved out by the WTO’s Enabling Clause*;
- Calibrated credit (as opposed to outright exemptions) for national or sectoral actions in the case of price-based regimes, to be further described below as *modifications to the adjustment level* (paras. 66-69), but no credit or exemptions for non-price based actions, these being simply too administratively difficult.

**37.** The existence of effective trans-shipment provisions is an important prerequisite for the first three of the recommended exemptions. Without them, any national or sectoral-level exemptions will be circumvented. Box 4 describes such provisions, and makes it clear that they are most feasible and effective when the goods in question are wholly obtained in a single country, or at least have a very simple supply chain. This creates a significant link to the following section, as it argues for a high threshold for coverage of goods/sectors, which would in effect preclude all but the small handful of energy-intensive trade exposed goods discussed in Box 5. Most of these have relatively simple supply chains.

#### IDENTIFYING GOODS/SECTORS TO BE COVERED

**38.** A second part of determining the scope of a BCA regime is determining what products or sectors in the implementing country should be covered by the scheme. This involves determining which

products are actually at risk of leakage. As a general proposition, if we are interested in preventing leakage we should prefer to make type I errors (covering those goods and sectors that are not really vulnerable) than type II errors (missing coverage for goods and sectors that are in fact vulnerable), which would argue for broad coverage.

39. There are, however, also a number of arguments for narrower coverage. For one thing, applying BCA to sectors with low vulnerability will yield limited benefits relative to the administrative costs involved. In the same vein, even if only the high-emitting highly traded sectors are covered (there are relatively few of them), the regime will deliver almost all its potential benefits in terms of reducing leakage.<sup>12</sup> As well, it was noted above that over-broad coverage will make it difficult to protect against gaming of the regime through trans-shipment, as it will begin to include manufactured goods and other goods that have long and complex supply chains. Over-broad coverage also skirts with trade law violations, as it constitutes support for domestic firms and sectors beyond what can be justified by environmental objectives. Finally, as noted below, any regime is likely to be applied imperfectly, pragmatically, probably leaving room for errors and deliberate manipulation. Balancing these arguments against the general desire for over-broad coverage leads to some optimal point which, in our view, is at the narrow end of the spectrum.

40. While the ideal determination of sectoral vulnerability would be a complex process of determining reliable estimates of such things as the responsiveness of net exports and the rates of cost pass-through, in the final event any workable regime would need to use a system that is simple enough to be operational and transparent, based on reasonably available data.<sup>13</sup>

41. BCA should only be used to protect sectors or products that are regulated with a price-based climate policy such as a carbon tax or cap and trade. These policies offer a clear carbon price on which to base the adjustments. Non-price policies should not be covered for two reasons. One, while they may raise costs and influence competitiveness, it is impossible to calculate in a transparent fashion the costs associated with the policy. Nor would it make sense to allow more inefficient climate policies (which impose higher costs) to have larger adjustments. Second, while they may impose costs on regulated sectors, and may mandate lower emissions, non-price policies do not require that producers pay for the remaining embodied carbon in their products, which is what BCAs are designed to adjust for.<sup>14</sup>

42. There are two criteria for this determination, and both should be used simultaneously to avoid over-broad sectoral coverage:<sup>15</sup>

- The first criterion should establish that the cost of GHG regulations would result in substantially higher production costs for the sector in question. Such costs should be calculated as the tonnes of GHG emitted by the sector, multiplied by the projected emissions tax or allowance price. These costs should then be evaluated relative to the economic size of the sector, as measured by value added. This ratio reflects the sector's GHG-intensity. The emissions data should be publicly available, as the enforcement of the GHG regulations will rely on it.

Some proposals instead use energy-intensity of production as an indicator for high regulatory costs, the data being easier to collect. But this metric is less reflective of the true cost impacts of GHG regulation. For one thing, not all energy production carries equal climate impacts. As well, process emissions and all non-energy sources of emissions are excluded from the calculation. In some sectors (e.g., agriculture, cement, waste management) the latter are at least as significant as energy-related emissions.

- The second criterion should establish that any attempt to pass those increased costs along to consumers would result in significant shifts of consumption to foreign sources. Note that a drop in consumption or profits is not in itself indicative of leakage; it may rather indicate that consumers are changing their behaviour by consuming less or by using cleaner substitutes, both of which are desirable ends. However, if consumption is merely *displaced*, rather than *reduced*, leakage is occurring. The ideal indicator for this criterion would be trade sensitivity – the degree to which cost increases would lead to a substitution to products sourced from abroad. Unfortunately, reliable metrics for trade sensitivity are not generally available.<sup>16</sup> A reasonably simple, albeit imperfect, proxy is trade exposure, measured as the value of imports and exports in the sector relative to total production plus imports.<sup>17</sup>

#### BOX 5: ENERGY-INTENSIVE TRADE-EXPOSED INDUSTRIES

Para. 42 recommends using two criteria to define coverage of goods in a BCA regime: GHG-intensity and trade sensitivity. What sorts of industries are implicated by using those criteria? We can get an idea by looking at what would have been covered under the 2009 US Waxman-Markey regime for allowances to sectors at risk of leakage. The criteria were similar to those we advocate, using an energy intensity of 5% and a trade intensity of 15%.

The list below is drawn from an Inter-Agency report in the US that predicted 44 of 500 6-digit industries would be covered by those criteria. These are for the most part inputs to other industrial processes, at or near the beginning of the value chain.

- Malt manufacturing
- Wet corn milling
- Rendering and meat byproduct processing
- Yarn spinning mills
- Pulp and paper (5 industries)
- Petrochemical manufacturing
- Chemical manufacturing (10 industries)
- Fertilizer manufacturing
- China/glass/ceramics (9 industries)
- Cement and lime manufacturing (2 industries)
- Mineral wool/ground or treated mineral, earth (2 industries)
- Iron and steel mills, iron foundries (2 industries)
- Electrometallurgical ferroalloys
- Iron/steel pipe/tube manufacturing
- Primary aluminum
- Smelting and refining, non-ferrous metals (3 industries)
- Carbon and graphite product manufacturing
- Mining: iron ore, copper ore, nickel ore (2 industries)

## 4. DETERMINING THE LEVEL AND TYPE OF ADJUSTMENT

43. Any BCA regime will need to elaborate how it calculates the adjustment it will assess on the covered products. This involves first determining (or estimating) the amount of embodied carbon in a given product. It then involves calculating the level of adjustment, applying any necessary exemptions and deciding what form of adjustment will be used, as well as how the embodied carbon will be priced in the adjustment.

### ASSESSING THE CARBON CONTENT

44. The objective is to calculate an accurate carbon footprint for imported covered products. Meeting this objective becomes more difficult if the product can be manufactured using more than one process (with widely different emissions profiles), or if the manufacturing process simultaneously manufactures multiple products (it's difficult to attribute emissions across several products).

45. Assessing carbon content involves setting system boundaries, determining the sort of benchmarks to be used in place of actual emissions data where necessary, and using accurate data reported to agreed protocols. Each of these steps is examined in greater depth below.

### The system boundary

46. The system boundary—the delineation that determines what is in and what is out of the calculation of a product's carbon footprint—can be set to cover any or all of: the production process itself; inputs used in the production process; credit for by-products such as blast furnace slag (a clinker substitute in the cement sector, produced by the steel sector); transport of final products to market; consumption of the product; and its final disposal.

47. The direct emissions from a production process (scope 1 emissions – emissions from sources that are owned or controlled by the producer<sup>18</sup>) should always be included within the system boundary. The decision to further hold the exporter responsible for emissions associated with inputs into the production process and downstream transport, consumption and disposal of the product depends predominantly on: how significant the inclusion of the GHG emissions would be; whether GHG emissions are already accounted for within another sector; and the practicality of collecting data which is sufficiently robust.

48. Indirect emissions—those emissions that are a result of production but occur at sources not owned by the producer—can be usefully divided into energy-related emissions (scope 2 – off-site generated electricity, heat or steam) and other indirect emissions (scope 3 – e.g., from transport of inputs).

49. The question of how to treat scope 2 emissions is a key consideration for many products. There are a number of arguments for including them in the system boundary. For one thing, such emissions can represent the majority of emissions from processes such as the smelting of metals (e.g. aluminum, copper, titanium), and represent a material share of total GHG emissions from sectors such as steel and cement. As well, such industrial energy-related emissions are a significant portion of many national emission

inventories, and as such they should probably be covered by any national climate policy. Where they are so covered, any BCA regime would also need to cover them. Otherwise energy-intensive firms relying on off-site generation would be subject to the same regulatory costs as those generating on site, or those with high process (non-energy-related) emissions, but would not receive the same shelter from international competition. Aside from the basic inequity of such an arrangement, the risk of leakage is obvious. Finally, non-inclusion for scope 2 emissions creates incentives for on-site generation of electricity, heat and steam which, depending on the circumstances, may be less efficient (i.e., more emissions-intensive) than off-site generation.

50. As such, we recommend that emissions from electricity, heat and steam generated externally (scope 2 emissions) should be included within the system boundary. The EU Commission's benchmarks developed for Phase 3 of its Emission Trading System (EU ETS) include emissions from both electricity and heat generated externally.

51. Where by-products are in the form of energy that is exported outside the plant's boundaries (for example electricity exports, the export of waste heat, the export of blast furnace gas), GHG emissions should be credited to the production process, using the same methodologies as for the import of such products. We do not recommend, however, that credit be granted for the export off-site of non-energy by-products. There is a risk of double counting of GHG emission reductions, and downstream users do not tend to accept that they should be responsible for the GHG emissions embodied in the by-products they purchase.

52. Scope 3 emissions are other (non-energy-related) indirect emissions from, for example, the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, etc. We recommend that these not be included in the system boundaries, since the calculations would be complex, covering many types of activities for which no data or benchmarks exist. Moreover, scope 3 does not tend to be a significant source of emissions relative to total emissions.

53 The reasoning is similar for emissions from the transport of products to market; these are indirect emissions not covered by scope 2 or 3 which would ideally be within the system boundary. There are, however, major challenges in identifying which route a specific product has taken and ascribing to that product the transport-related emissions. Given that complexity, and the fact that GHG emissions from transport tend to be low relative to the emissions from the energy-intensive production processes potentially covered by a BCA, we do not recommend that GHG emissions from transport to market be included.

54. Expanding the system boundary to include GHG emissions from the consumption and disposal of products would represent a major departure from current GHG accounting practice. There is no consensus on the extent to which responsibility to reduce these emissions should lie with their manufacturers. Moreover, there are significant uncertainties in defining the appropriate boundaries, and results from applying life-cycle assessment techniques are

**Table 2: Benchmarks**

BENCHMARKS	GLOBAL ENVL EFFECTIVENESS	FEASIBILITY	POLICY COHERENCE	GOOD GOVERNANCE
Avg emissions intensity in exporting country	no incentives for worse-than-average performers to improve	requires data from foreign jurisdictions that might not be available or verifiable	conflicts with GATT MFN, possibly saved by GATT Art. XX	
Avg emissions intensity in implementing country	low incentives for improvement; low protection against leakage	simple scheme		
Emissions intensity from best available technology	very low incentives for improvement; very low protection against leakage	simple scheme	unlikely to raise WTO challenges	
Emissions intensity from worst practice in importing or exporting country	high protection against leakage	if based on exporting country, requires data that might not be available or verifiable	quasi-punitive, and counter to spirit of S&DT, CBDR; if based on exporting country, conflicts with GATT MFN	
Hybrid scheme: uniform reference for scope 1; exporting country reference for scope 2	reasonable protection against leakage if scope 2 benchmark is stringent	data relatively easy to obtain	scope 2 benchmark conflicts with GATT MFN - but not as bad as pure exporting country benchmarks	

considered uncertain and controversial. We do not recommend that GHG emissions from the consumption and disposal of products be included within the system boundary.

### The benchmarks

**55.** If exporters are unable or unwilling to provide third-party verified data to a protocol or standard specified by the implementing jurisdiction, or if the production process is the end result of a complex value chain including suppliers from many countries,<sup>19</sup> benchmarks should be used. Benchmarks should aim to capture carbon content as accurately as reasonably possible. They should be set in good faith and should not be punitive. In that spirit, when the benchmarks are set, whatever system boundaries are applied to implementing country producers should also be applied to exporting country producers.

**56.** Multiple benchmarks might be needed where there are multiple production processes for a single product.<sup>20</sup> For example steel can be made from iron ore using a process starting with a blast furnace, or from scrap steel using an electric arc furnace. The two have vastly different GHG intensity profiles, meaning they may need different benchmarks. As a general proposition a single benchmark for any given product is greatly preferred; multiple benchmarks provide no incentives to encourage switching to the cleaner of the various available technologies, since they allow producers using the less efficient production processes to do so unpenalized. They also raise trade law issues since commodities produced in different ways will probably be viewed as “like” under trade law, and so deserving of similar treatment.<sup>21</sup> In some cases, however, they might be necessary since mitigation options are limited. In steel, for example, the use of the cleaner technology is limited by scarce supplies of the input – scrap steel – and thus different technology benchmarks are needed.<sup>22</sup> Significantly different technologies, or significantly different use of mitigation technologies, also exist in other sectors of interest: chemicals such as adipic acid, for example.

**57.** Different types of emissions might call for different

benchmarks. Scope 1 emissions, for example, are amenable to an international standard – one applied equally regardless of the country of production – since non-energy emissions are not particularly dependent on country-specific factors. Energy-related emissions from outside the plant boundary (scope 2), on the other hand, will vary considerably depending on country-specific factors such as the national energy mix, and so country- or region-specific GHG emission benchmarks should probably be applied.

**58.** There are a number of options for policy makers to choose from in setting benchmarks. Four main variants are examined below, again using the criteria we enunciated at the outset.

**59.** *Average emission intensity in the exporting country.* This benchmark would be somewhat effective at preventing leakage. Using an average has the disadvantage that any producers with above-average GHG intensities are assessed at the average level, meaning there are no incentives for those poor performers to improve to the average level and little to prevent them from gaining market share via lower costs. As well, there is no reward or incentive for performing better than average unless the regime features an option for submitting actual data. Using exporting country data as a basis could be problematic where such data are not readily available or verifiable, and gathering such data across a variety of exporting countries would be arduous. Discriminating by country conflicts with GATT’s MFN provisions, though there is a chance that this sort of benchmark might be saved by GATT’s Article XX exceptions, since it can be argued to be environmentally based and non-arbitrary, and since like all benchmarks discussed here it is only used when individual producers fail to provide firm-specific data. This benchmark would need to be accompanied by provisions to prevent trans-shipment from countries assigned higher intensity benchmarks (see Box 4).

**60.** *Average emission intensity in the implementing country.* This benchmark would be less effective at preventing leakage, assuming the importing country producers were relatively “clean”; the lower the assumed emissions intensity of the benchmark, the less actual adjustment it forces, and therefore the less effect it has on GHG-

intensive producers. However, it is a straightforward scheme with relatively simply calculated benchmarks, and because all importers face the same benchmark it has no MFN issues.

**61. *Emissions intensity from best available technology (BAT).***<sup>23</sup> As the benchmark with the lowest assumed GHG intensity, this is also the least effective at preventing leakage or offering incentives for improvement. It is also a straightforward scheme, and perhaps the least likely to be successfully challenged under WTO law, because of its low level impacts and its non-discrimination (i.e., a single benchmark for all countries).

**62. *Emissions intensity from worst practice.*** This benchmark probably represents the most effective option for preventing leakage, due to its high assumed GHG intensity. If it is based on exporting country practice, it presents the challenge of needing data from many jurisdictions, some of which might not be available or verifiable. An exporting country benchmark would also need to be accompanied by trans-shipment provisions (see Box 4), and would be in conflict with GATT MFN obligations. If it is based on implementing country practice, it would presumably be somewhat less effective at preventing leakage. The high level of charges implied by this benchmark could be argued to be counter to the spirit of CBDR and S&DT. While it could be countered that those charges would only apply to those that did not furnish their own verified data, the process of supplying that data is a costly one as noted above, and would be particularly difficult for small and medium-sized enterprises to bear. This benchmark errs on the side of caution, over-assessing many covered firms. This runs counter to the objectives of the benchmark, and potentially causes trade law issues. The problem is partially ameliorated by the option to submit individual firm data.

**63. *Hybrid scheme.*** It was noted above that scope 1 emissions and scope 2 emissions differ fundamentally. While scope 1 (direct process emissions) tend to be roughly similar for EITE sectors globally, scope 2 (indirect emissions from purchased energy) tend to vary considerably based on country characteristics. A hybrid benchmark would assess a uniform benchmark—such as average implementing country practice—to scope 1 emissions, while scope 2 emissions would be subject to a benchmark that reflected exporting country practice – such as average GHG intensity. Such a system avoids the disadvantages of a pure implementing country benchmark; a stringent standard for scope 2 emissions only is not as punitive as a stringent standard overall, but the regime still performs well at preventing leakage, since it allows the more stringent benchmark to focus only on those areas (scope 2) where there is the most scope for regional variation. It also avoids the problems inherent in a pure exporting country benchmark; data is not such a problem if only scope 2 is being covered, and there are still incentives for improved practice since the area where the greatest mitigation is available – scope 2 emissions – is covered by a standard that can be set at stringent levels. Combining a hybrid scheme with the ability to submit actual data allows for even more effective incentives. A hybrid scheme of this type would still face GATT MFN problems, but other things being equal would probably be more defensible than a pure exporting country benchmark.

**64.** In light of this analysis, we recommend that benchmarking be conducted as follows, understanding that all regime options offer trade-offs between various objectives, and none satisfies all criteria:

- In the first instance, producers should be required to provide third-party verified firm-level data on emission intensity, using the same system boundaries used for implementing country producers. Only when that is not forthcoming should benchmarks be used as a fallback. This attention to individual producer circumstances has the advantage that it increases the odds that any scheme will be found WTO legal, and it provides incentives to producers to improve their processes.
- The benchmarks developed should be product-specific, and also where necessary specific to different production processes. In principle, it is preferable to have only one benchmark for any given product, but where a product has significantly different technologies in use (in terms of GHG intensity, abatement options), more than one benchmark may be needed.
- For scope 1 emissions (direct emissions), the benchmarks should use average emissions intensity in the importing country. This is in our opinion the best compromise among the competing imperatives of the various judging criteria we applied. It offers strong protection against leakage, but because it is only employed where firms have declined to report actual emission data it is not punitive, and offers some incentives for good practice.
- To counter the negative impact of costs of compliance, we strongly recommend that implementing states offer support, in the form of financial and technical assistance in accounting, reporting and verification, to assist foreign covered exporters in submitting verified individual data.
- For scope 2 emissions (energy, steam and heat generated off site) the benchmarks should use average data from the exporting countries. Fairness dictates that producers who use on-site-generation, which falls under scope 1 and would otherwise be subject to importing country average practice as a benchmark, should have the option to calculate their energy-related emissions using the same exporting country average benchmark used for scope 2 emissions.

#### The data

**65.** The data submitted by exporting producers should be measured and reported to a specified protocol and verified by a third party. Using international standards and protocols where available, both for submission of firm data and for the creation of benchmarks, would help to ensure compatibility with WTO rules and may help reduce administrative burdens. There are a number of protocols which can be used, for example the WBCSD/WRI GHG Protocol<sup>24</sup>; ISO Standards including 14064 and 14065; the British Standard Institute (BSI) PAS2050; and methodologies used within the UNFCCC Clean Development Mechanism to



account for GHG emission reductions from changes in electricity generation technologies and reduced electricity consumption.<sup>25</sup>

#### MODIFICATIONS TO THE ADJUSTMENT LEVEL

**66.** The recommendations featured in paragraph 36 propose calibrated credit for price-based climate policies (e.g., cap and trade, carbon tax, carbon-related export tax) in the country of export, either at the national level or at the sectoral level. Such credit is important for at least two reasons: first, it would probably be critical to allowing any BCA regime to pass the legal threshold presented by the chapeau of GATT Article XX.<sup>26</sup> Second (and closely related), it would help ensure that the BCA regime only levied adjustments to the extent necessary to offset the *differential* between the foreign climate policies and the domestic climate policies; this is the ideal. As noted above, in our view the practical difficulties involved in trying to assess the effects of non-price-based policies (such as renewable energy support) make it necessary to achieve less than that ideal.

**67.** Where calibrated credit is used, an agreement would have to be negotiated between the two states involved that was analogous to an equivalency agreement on standards in traded goods, or a linking agreement between distinct emissions trading systems, or a bilateral taxation treaty. Where the implementing country regime is a cap and trade, the agreement would focus on the differences between how the two regimes handle such things as sectoral coverage, offsets, etc. Where the regime is a tax it would focus on, among other things, different sectoral coverage, any exemptions or tax preferences, etc. The agreement would establish the level of credit the regime in the exporting country would receive for its climate policies, and determine how much the border adjustment would be lowered as a result. Clearly the agreement would need to be revisited in light of changing policies. As with the exemptions described above, any system of calibrated credit would need to be accompanied by provisions to prevent trans-shipment.

**68.** Any free allowances or other compensatory mechanisms to shelter domestic firms need to be taken into account when calculating the amount of adjustment due. Depending on the regime, this might conceivably mean that the level of BCA is adjusted down to zero.<sup>27</sup>

**69.** Special benchmarks or calibrations could be developed for less developed countries (if they are not exempt), to respect the principle of CBDR. The importing country could assume, for example, that all imports from LDCs have used best available technology, or could grant more credit for climate policies than would be due a developed country. This exemption would have to be accompanied by trans-shipment provisions.

#### TYPE OF ADJUSTMENT

**70.** Adjustments need not be in the form of levies. An alternative, for example, would be to allow importers or foreign producers to purchase international carbon offsets up to the determined value of adjustment.

#### PRICING THE CARBON CONTENT

**71.** Once the carbon content—or the best proxy thereof—has been determined for a given good, it remains to price that carbon

to arrive at an adjustment. If the implementing country firms are regulated with a carbon tax, the carbon price they pay should be the basis for the price charged to exporting country firms. To avoid unpredictable swings in price, the price should be set on a regular and infrequent basis—say annually—based on a rolling average of previous periods of measurement.

**72.** If the implementing country uses a cap and trade regime, the exporting country firms should be regulated such that they come as close as reasonably possible to purchasing offsets on the same terms offered to their competitors in the implementing country.

## 5. THE APPLICATION OF BCA TO EXPORTS

**73.** Border adjustment for exports would relieve exports from the implementing countries of the burden of the carbon payments associated with their production. This policy is integral to implementing true destination-based carbon pricing, if that is the goal. We noted above the analogy to the current prevalence of destination-based taxation under national VAT schemes. Adjustment for exports would avoid the equivalent of double taxation where the products were being shipped to a destination state that also applied BCA to its imports.

**74.** Export adjustment also helps avoid leakage from loss of market share in third country markets, making exports from regulating countries less disadvantaged in those markets relative to products from non-regulating countries. Without this adjustment any adjustment to imports covers only a part of the leakage picture.

**75.** If export adjustments are used they should be designed carefully, so as to preserve the domestic carbon pricing incentives for reducing emissions intensity. Rather than exempting exported goods, a rebate could be offered for exported products in proportion to a metric of their embodied carbon. That metric would need to be based on sector-wide, rather than firm-specific, calculations, so that firms do not expect larger emissions to generate larger rebates. As with import adjustments, a best-available technology metric avoids the possibility of over-adjustment, but has weaker effects on competitiveness and leakage than an average emissions metric. The same considerations apply in the choice of this benchmark that were discussed in the context of a benchmark on the import side.

**76.** To date, policymakers have preferred to focus on adjustment for imports only. One of the most important reasons for this is probably the unclear legal status of BCA for exports under WTO law. At the end of the day a wide range of legal scholars agree that it is not clear whether such adjustment would constitute a prohibited subsidy under the WTO's Agreement on Subsidies and Countervailing Measures.<sup>28</sup> But there does seem to be a "gentlemen's agreement" (i.e., without legal force) within the WTO not to rebate taxes levied on inputs that are consumed in the production process.<sup>29</sup>

**77.** Another reason might be the empirical evidence that shows that most of the benefits of a BCA regime, in terms of preventing leakage, can be captured by a scheme that contains only adjustment on imports.<sup>30</sup> This finding, however, only holds for those countries that are heavy net importers of covered goods.

**78.** Border adjustment for exports is difficult to reconcile with an approach, like the one recommended in this text, that advocates

exemptions from import adjustment. To illustrate: we believe that BCA should not be applied to the exports of, for example, countries with national emissions caps, because there is no risk of leakage to such countries. Clearly any rebates to implementing country exports to such countries would constitute unfair subsidies that, if the destination country were not practicing BCA, would induce leakage to the implementing jurisdiction. Any justification for national exemptions on the import side is also a justification for not adjusting on the export side.

**79.** The problem is that it is impossible to create country-level exemptions on the export side. Any such exempted goods could easily be trans-shipped from the destination country to other countries that do not qualify for an exemption. There is no feasible way to avoid such an outcome. As such, while export adjustment seems compatible with an approach that has no national exemptions, and which relies on other countries also practicing BCA (analogous to the world's VAT regimes), it does not mesh well with an approach that has national exemptions, where countries have varied and uncoordinated climate policies.

**80.** Export rebates are also problematic when combined with multiple benchmarks in the domestic regulatory regime.<sup>31</sup> If there are multiple benchmarks for a single product depending on the production process, the higher emissions products will be used by exporters by preference, since they will receive higher export rebates. If those higher emissions products are located further away from the downstream producer than are the low emissions products, then there are perverse incentives to increase transport-related emissions in the production process. Depending on the costs of transport and the differential in benchmark specifications, the implementing jurisdiction might end up exporting high-intensity products and importing low-intensity products from the rest of the world, hypothetically with little or no change in global production practices but with much higher levels of transport.

**81.** Given these problems and the potential clash with trade law, we do not recommend the use of export adjustment in BCA regimes.

## 6. USE OF REVENUES FROM IMPORT ADJUSTMENTS

**82.** There are a number of options for the use of the revenues collected by means of adjustment applied to imports. They include:

- Direct the collected funds to general revenues in the implementing country;
- Refund any adjustments collected to the exporting country, either directly or to subsidize clean technology transfer;
- Contribute adjustments collected to internationally administered funds for climate change mitigation and/or adaptation;
- Designate funds collected to be disbursed by the implementing country in ways that benefit developing countries (e.g., finance for mitigation and adaptation projects).

**83.** We recommend against the first option, though we recognize that any use of this revenue will have to take place within the context

of domestic fiscal realities, and some jurisdictions discourage or prohibit hypothecation of tax revenues to specific purposes. Ensuring that the revenues are not retained by the implementing country removes incentives to use BCA to enhance domestic welfare by manipulating the terms of the adjustment.

**84.** The remaining three options move the regime as a whole toward better respect for the principles of CBDR and S&DT. As well, while it is impossible to say *ex ante* how a BCA regime would fare if taken to WTO dispute settlement, any of these three options would likely improve its chances of success in that context, since they would help demonstrate that the BCA regime was in fact aimed at achieving environmental objectives.

**85.** For such measures to be meaningful, it would be important to ensure that the earmarked contributions be additional to those already required by international agreements, or pledged under existing programs of support. That is, they should not simply replace funds from existing commitments.

## 7. OTHER DESIGN GUIDANCE

**86.** Best practice in institutions and governance for BCA can be drawn from a rich tradition of norms and principles found in trade and administrative law, industry practice and economics.

### PRE-ESTABLISHMENT GUIDANCE

**87.** Exporting countries should be notified of BCA proposals at an early stage (when amendments can still be introduced and comments taken into account), with draft text distributed to them on request. There should be opportunity for exporting countries and firms to present their comments in writing. These should be discussed upon request, and the written comments and the results of these discussions should be taken into account in the final regime design.

**88.** Entry into force of any BCA regime should give exporters and exporting country governments enough lead time to adjust their policies and practices.

### OPERATIONAL GUIDANCE

**89.** An official point of contact should be designated to respond to questions and requests for documents from exporting countries and firms.

**90.** The decision-making process should be predictable and transparent, with methodologies for determining vulnerable sectors, level of adjustment and country-level applicability, for example, being public information.

**91.** Calculations with respect to individual countries and exporters—for example, default emissions intensity baselines—should be regularly reviewed and revised where necessary. The parameters of the regime should also be regularly reviewed – at least on an annual basis. Exporting countries and firms should be able to make submissions to the review processes.

**92.** There should also regular review of BCA regimes aimed at assessing their effectiveness in meeting their stated objectives.

**93.** There should be mechanisms within the BCA regime whereby exporting countries and firms can appeal decisions and calculations that concern them.

## SUNSET GUIDANCE

**94.** The measures should be time limited and should have clear conditions for phase-out. BCA should only be intended to offer temporary effect during a period of transition to a low-carbon economy and broader international cooperation. At a minimum, the continued application of BCA should be contingent on explicit criteria related to the state of progress in achieving a low-carbon economy, and in achieving international cooperation on climate change action. ■

### ANNEX I: COMPOSITION OF THE DRAFTING GROUP

(Note: all members participate in their personal capacities)

*Aaron Cosbey*, International Institute for Sustainable Development, Canada

*Susanne Droege*, German Institute for International and Security Affairs, Germany

*Carolyn Fischer*, Resources for the Future, USA

*Julia Reinaud*, Institute for Industrial Productivity, France

*John Stephenson*, New Zealand Institute of Economic Research

*Lutz Weischer*, World Resources Institute, USA

*Peter Wooders*, International Institute for Sustainable Development, Switzerland

<sup>6</sup> If the exporting country is Party to a multilateral agreement on climate change to which the implementing country is also party, then this is a special case of adequate action, and is covered above.

<sup>7</sup> Under such a regime even non-climate-related policies (such as energy security) would count when the home country determines adequacy of effort. There are pros and cons to such a procedure. On the pro side, such policies have major climate benefits. As well, it is impossible in practice to demonstrate the intent of a policy – countries could simply rename their policies to make them appear to be climate-motivated. On the other side of the argument, it is extremely difficult to compare costs across different sorts of policy tools. It would be much simpler to only consider carbon taxes or ETS as schemes that count in cost comparisons, or that count in determining adequacy of effort.

<sup>8</sup> Not offering credit for significant climate policy efforts in exporting countries would count against the regime in an Article XX defence. Much of that defence would consist of proving (in the context of the Article's chapeau) that the regime was indeed aimed at environmental objectives, and was not arbitrary in its application. A regime that did not give credit to efforts equivalent to the importing country's regime (even if it was not identical in form to that of the importing country), or which did not give partial credit for significant climate policies, would be suspect on both these grounds. It can be argued that a perfect regime is not administratively feasible and these arguments might have force, especially for developing countries, but our judgment is that for price-based policies offering credit is, if difficult, feasible.

<sup>9</sup> To be clear – as with all permutations of BCA there could still be a trade law complaint of discrimination between *like* goods, based on the argument that high-carbon and low-carbon goods are like in trade law terms. But compared to country-based discrimination this type arguably stands a better chance of passing Article XX's strictures to be found an acceptable environmental measure.

<sup>10</sup> The 27 Rio Principles are found in the *Rio Declaration on Environment and Development*, signed at the 1992 Earth Summit in Rio de Janeiro. Principle 6 states: "The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority."

<sup>11</sup> "Differential and more favourable treatment reciprocity and fuller participation of developing countries," (The Enabling Clause). Decision of the GATT Contracting Parties of November 28, 1979 (L/4903), para. 3(a).

<sup>12</sup> While a significant portion of total carbon trade globally is embedded in manufactured products, the value of carbon in those products as a percentage of value added tends to be low relative to the same calculation for the types of commodities listed in Box 5. The result is that potential for leakage is low for manufactured products, given the lower relative cost impacts from carbon pricing. Under plausible modeling assumptions while basic manufacturing sectors face potentially significant output cost increases as a result of domestic climate measures, and may be unable to pass these along to consumers, manufacturers of goods such as machinery, computers and electrical equipment, motor vehicles and apparel all face much lower, almost insignificant, output cost increases (Liwayay Adkins, Richard Garbaccio, Mun Ho, Eric Moore and Richard Morgenstern, 2012. "Carbon Pricing with Output-Based Subsidies: Impact on U.S. Industries over Multiple Time Frames." RFF Discussion Paper 12-27. Washington, DC: Resources for the Future.)

<sup>13</sup> Any parallel attempts to craft sectoral approaches to dealing with leakage concerns should be mined for the valuable information and data they could provide.

<sup>14</sup> For example, performance standards may set a maximum emissions intensity, but they do not charge for all emissions. They are a less efficient version of tradable performance standards, which implicitly combine a price on emissions with a subsidy to output, equal to the value of the per-unit emissions allocation, the performance standard. This treatment is similar to output-based allocation under a cap-and-trade scheme, which is a substitute for BCA; at a minimum, the same (implicit or explicit) allocation would have to be afforded imports.

<sup>15</sup> These are the criteria chosen for use in the US Waxman-Markey bill as a basis for rebates, and for use in the EU's ETS as a basis for issuing free allowances. In the case of the Waxman-Markey bill they would also be the basis for coverage under the BCA regime. They are, however, not the only criteria that could be used.

<sup>16</sup> These would rely on estimates of elasticities of substitution between domestic and foreign products.

## FOOTNOTES

<sup>1</sup> We use the term "carbon" in the loose sense that includes carbon equivalent of other greenhouse gases.

<sup>2</sup> The nature of these measures to address climate change in the implementing country are important to the BCA regime, though they are not addressed to any great extent here. It will, for example, be much simpler to implement a BCA regime as an accompaniment to domestic policies that involve carbon pricing (such as carbon taxes or cap-and-trade) than to have BCA accompany other sorts of regulatory efforts, to the point where it is argued below that BCA should not be used as a complement to non-price-related regulatory approaches (see para. 41).

<sup>3</sup> The standard formula for calculating leakage is the change in foreign emissions (specifically, the change that resulted from domestic regulation) divided by the change in domestic emissions.

<sup>4</sup> As noted below, however, there is an indirect environmental argument for preventing sectoral leakage if it is key to political acceptability of domestic climate action. That is, some sectors are so politically important that the prospect of sectoral leakage may deter policy makers from pursuing national-level climate action.

<sup>5</sup> The classic dispute of this sort is a set of disputes that can be lumped together as US-Shrimp (DS58, DS61, DS324, DS335, DS343). The issue in those cases was US regulations that banned the import of shrimp caught in ways that killed endangered sea turtles. The WTO Appellate Body eventually agreed that the US had the right to take this sort of unilateral measure based on how the product was produced (with numerous caveats). But the divisive rift that this caused in the trade community still echoes today in terms of distrust and antagonism.

<sup>17</sup>The actual formula used to calculate trade exposure is  $(M+X)/(Q+M)$ , where M=imports, X=exports and Q=production.

<sup>18</sup>The definitions of scope 1, 2 and 3 emissions used in this section are taken directly from the GHG Protocol. See [www.ghgprotocol.org](http://www.ghgprotocol.org).

<sup>19</sup>Fortunately, as noted above, cost effectiveness considerations would very likely exclude manufactured products from coverage.

<sup>20</sup>Some of the EU ETS Phase 3 benchmarks are based on this methodology, for example there are multiple benchmarks for the production of: pulp (for paper); steel (from primary reduction or electric arc furnace); and aluminum (whether it goes through the primary electrolysis route or not).

<sup>21</sup>This violation of GATT's non-discrimination provisions might be saved by Article XX if it can be successfully argued that the environmental objectives of the regime (preventing leakage) are frustrated by a single benchmark per product, but that seems a difficult argument to make. On the other hand a single benchmark, in cases such as steel production where alternative technologies are limited, might be seen as unnecessarily trade-distorting and arbitrary.

<sup>22</sup>This case underscores the need to understand the technical and financial dynamics of the covered sectors in some detail in order to properly set benchmarks.

<sup>23</sup>It should be noted that the EU ETS's Phase 3 benchmarks, which are set at the level of the average of the 10% best EU producers, are designed only as a method for allocating free allowances, and were not designed to be applied to importers under a BCA or other scheme.

<sup>24</sup>The WBCSD/WRI GHG Protocol is detailed at: <http://www.ghgprotocol.org/>. Specific cement and steel sector initiatives have been developed over the past few years by: the Cement Sustainability Initiative (see "Getting the Numbers Right", at: [www.wbcsdcement.org/index.php?option=com\\_content&task=view&id=57&Itemid=118](http://www.wbcsdcement.org/index.php?option=com_content&task=view&id=57&Itemid=118)); the World Steel Association (see <http://www.worldsteel.org/climatechange/?page=2&subpage=2>).

<sup>25</sup>For a reference list of accepted CDM methodologies, see UNFCCC, 2012. *CDM Methodology Booklet*. Bonn: UNFCCC. Available at: [http://cdm.unfccc.int/methodologies/documentation/meth\\_booklet.pdf](http://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf).

<sup>26</sup>See discussion at footnote 8.

<sup>27</sup>It is worth noting that compensatory mechanisms could even constitute a subsidy which would *in theory* mean that the adjustment should be negative. It would, of course, be rather idealistic to recommend that this possibility should be recognized in BCA regimes, but it is worth noting nonetheless.

<sup>28</sup>De Cendra, Javier. 2006. "Can Emission Trading Schemes be Coupled with Border Tax Adjustments? An Analysis vis-à-vis WTO Law." *RECIEL* 15(2): 131-145; Tamioti, Ludivine et al., 2009. *Trade and Climate Change: A report by the United Nations Environment Programme and the World Trade Organization*. Geneva: UNEP/WTO; Coppens, Dominic. 2010. "Balancing Policy Space and Policy Constraints? A critical legal analysis of WTO disciplines on subsidies and countervailing measures." Doctoral thesis, Katholieke Universiteit Leuven Faculteit Rechtsgeleerdheid.

<sup>29</sup>Letter from Donald M. Phillips, Assistant US Trade Representative for Industry, to Abraham Katz, President, US Council for International Business (5 January 1994), printed in "US Secures Agreement Not to Allow Energy Tax Rebate," *Inside US Trade* (28 January 1994), 20. For analysis see Hoerner, A. and F. Muller. 1996. "Carbon Taxes for Climate Protection in a Competitive World," (Paper prepared for the Swiss Federal Office for International Economic Affairs).

<sup>30</sup>Christoph Böhringer, Thomas F. Rutherford and Edward J. Balistreri. (*forthcoming*). "The Role of Border Carbon Adjustment in Unilateral Climate Policy: Insights from an EMF Model Comparison." *Energy Policy*.

<sup>31</sup>Ismer, Roland and Karsten Neuhoff, 2009. "Border Tax Adjustments: A feasible way to address nonparticipation in emission trading." *Cambridge Working Papers in Economics* 0409, University of Cambridge, p. 27 – 28.





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Sweden, +46 (0)8 598 56 300  
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