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**DOMESTIC CLIMATE CHANGE POLICIES
AND THE WTO**

Lucas Assunção and ZhongXiang Zhang

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DISCUSSION PAPERS

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* Fax: (4122) 907.0274; E-mail: mdpb-ed.assistant@unctad.org

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DOMESTIC CLIMATE CHANGE POLICIES AND THE WTO

Lucas Assunção and ZhongXiang Zhang *

Abstract

The Kyoto Protocol sets reduction targets to greenhouse gas emission levels in developed countries, including OECD and East European countries (the so-called Annex 1 Parties to the Climate Change Convention). The Kyoto Protocol gives Annex 1 countries considerable flexibility in the choice of domestic policies to meet their emissions commitments. Possible climate policies include carbon/energy taxes, subsidies, energy efficiency standards, eco-labels, and government procurement policies. In order to meet their Kyoto targets with minimum adverse effects on their economies, Annex 1 Party governments with differentiated legal and political systems are highly likely to pursue climate policies that may have the potential to bring them into conflict with their WTO obligations. This paper explores the potential interaction between these domestic climate policies and WTO rules. It argues that their potential conflicts can be avoided or at least minimized if WTO rules are carefully scrutinized, and efforts are made early on to ensure that the proposed climate policies comply with them. It suggests an early process of pursuing consultations between WTO members and the Parties to the Climate Change Convention and points to the need to further explore ways to enhance synergies between the trade and climate regimes.

I. INTRODUCTION

Climate change as a result of increased atmospheric concentrations of the so-called greenhouse gases is an externality. To date, such an externality has not been internalized in production processes, input costs, consumer choices and energy markets. The continuous unconstrained reliance on fossil fuels bears witness to the neglect of the climate change externality: current energy policies fail to consider the costs of stabilizing greenhouse gas concentrations in the atmosphere at a level which would prevent potential catastrophic damages (and hence future economic costs). Part of the reason for this policy failure resides in the fact that climate change has so far been treated as an isolated environmental issue, whereas climate change is essentially a cross-sectoral economic problem. Given the multitude of greenhouse gas emission sources in both developed and developing economies, policy responses will require a fundamental change in the way that energy is produced and the way it is used.

The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) marks the first step towards an international determination to limit emissions of greenhouse gases. It is widely regarded as an important mechanism towards correcting the climate policy failure and a major push towards the internalization of the climate change externality. The Protocol has set legally binding reduction targets and timetables on greenhouse gas emissions for Annex 1 countries (i.e. the OECD countries and countries in transition to a market economy)¹ and

* Lucas Assunção is Coordinator, Climate Change and BIOTRADE Initiative Programmes, United Nations Conference on Trade and Development, Geneva, Switzerland. ZhongXiang Zhang is a professor of economics, East-West Center, Honolulu, USA; Centre for Environment and Development, Chinese Academy of Social Sciences, Beijing, China; and China Centre for Regional Economic Research, Peking University, Beijing, China.

¹ The Kyoto Protocol includes a basket of six greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). The Protocol will become effective once it is ratified by no less than 55 per cent of the parties whose CO₂ emissions represent at least 55 per cent of the total from Annex 1 countries in the year 1990. For the latest list of ratifications, see the UNFCCC web site at www.unfccc.de.

introduced three international flexibility mechanisms, namely i) international emissions trading, ii) joint implementation, and iii) the clean development mechanism (CDM). However, the Articles defining the flexibility mechanisms carry wording that their use must be supplemental to domestic actions. This has led to the open debates on interpretations of these supplementarity provisions.² With the United States withdrawal from the Kyoto Protocol in March 2001, the European Union dropped its previous insistence on a cap on the use of flexibility mechanisms to secure the reluctant support of other Umbrella Group³ members of the Protocol at the resumed sixth Conference of the Parties to the UNFCCC, held in Bonn, July 2001. The final wording of the Bonn Agreement, reaffirmed in the Marrakech Accords, is now that “domestic action shall thus constitute a significant element of the effort made by each Party included in Annex 1 to meet its quantified emission limitation and reduction commitments”. This at least indicates that domestic climate policies will have an important role to play in meeting Annex 1 countries’ emissions commitments.

Article 2 of the Kyoto Protocol gives Annex 1 countries considerable flexibility in the choice of domestic policies to meet their emissions commitments. Possible climate policies include carbon/energy taxes, subsidies, energy efficiency standards, eco-labels, and government procurement policies. In order to meet their Kyoto emissions targets with minimum adverse effects on their economies, it is highly likely that Annex 1 governments with differentiated legal and political systems might pursue emission reduction policies in such a way as to unfairly favour domestic producers over foreign ones. Such differential treatments could occur in governing eligibility for, and the amount of, the subsidy, in establishing energy efficiency standards, in the determination of the category of eco-labelled products and the procedures of establishing eco-labels, in specification criteria for tenders, and in specifying condition for participating in government procurement bids. In the case where a country unilaterally imposes a carbon tax, it may adjust taxes at the border to mitigate the competitive effects of cheaper imports that are not subject to a similar level of the carbon tax in the country of origin. A measure of this sort may well raise complex questions with respect to the WTO consistency and the conditions under which border taxes can be adjusted to accommodate a loss of international competitiveness. All this clearly indicates that these domestic climate policies may have the potential to bring countries into conflict with their WTO obligations.

However, Article 3.5 of the UNFCCC states the underlying principle that “measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade”. It is again carefully restated in Article 2.3 of the Kyoto Protocol.⁴ Thus, the real challenge for a country being both a WTO member and a Party to the Kyoto Protocol is to pursue both the Uruguay Round and Kyoto Protocol objectives through enhancement of synergy among policies and avoidance of conflict arising from unilateral discriminatory trade measures. After all, a conflict between the trade and climate regimes, if it breaks out, helps neither trade nor the global climate.

To date, however, such desirable policy coordination between the two regimes has not been addressed in a sufficiently serious manner. This paper aims to fill this gap by discussing carbon/energy

² See Zhang (2000, 2001) for a detailed discussion on these supplementarity provisions and on the assessment of the European Union proposal for ceilings on the use of Kyoto flexibility mechanisms.

³ The Umbrella Group refers to the so-called JUSSCANNZ countries (Japan, the United States, Switzerland, Canada, Australia, Norway, New Zealand). It meets daily during the international climate change negotiations to exchange information and discuss substance/strategy on issues where there is common ground.

⁴ Article 2.3 of the Kyoto Protocol states that “The Parties included in Annex 1 shall strive to implement policies and measures under this Article in such a way as to minimize adverse effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties and in particular those identified in Articles 4.8 and 4.9 of UNFCCC”.

taxes, subsidies, energy efficiency standards, eco-labels, government procurement policies, and exploring the potential interaction between these domestic climate policies and WTO rules.⁵ It highlights their potential conflicts, and argues that such conflicts can be avoided or at least minimized if WTO rules are carefully scrutinized, and efforts are made early on to ensure that the proposed climate policies comply with them. It suggests an early process of pursuing consultations between WTO members and the Parties to the Climate Change Convention and points to the need of further exploring ways to enhance synergies between the trade and climate regimes.

II. SUBSIDIES

Under the Agreement on Subsidies and Countervailing Measures (the Subsidies Agreement), a subsidy is defined as a financial contribution and/or a benefit conferred by a government to its domestic industries so that a given sector can develop with (temporary) lower production costs and improve its competitiveness. More specifically, it can take the form of direct transfers, loan guarantees, fiscal incentives such as tax credits, provision of goods and services other than general infrastructure, or direct payments to a funding mechanism. In the context of combating global climate change, the possibilities for fuel substitution and technical innovation are essential to the success of Annex 1 countries meeting their national emissions targets. However, clean technologies are relatively capital and knowledge-intensive, and renewable technologies are not yet competitive with conventional technologies. Thus, it is most likely that Annex 1 governments may use either of the above subsidy options or a combination of these options to promote energy conservation, the use of renewable energy, and/or the increased adoption of less carbon-emitting technologies. By encouraging producers to take environmentally beneficial actions, such subsidies contribute positively to the environment.⁶ In the economic jargon, these subsidies “capture positive environmental externalities”, in the sense that they would promote production with lower greenhouse gas emission levels.

It is conceivable that in introducing subsidy incentives to domestic firms, governments will obviously attempt to foster industrial development and, at the same time, achieve reductions in present or future greenhouse gas emissions. However, if the sector where such subsidies are introduced is significantly open to foreign trade, such subsidies could potentially be challenged under WTO rules. The question is then the conditions under which such subsidies would run against WTO rules.

Article 3.1 of the Subsidies Agreement prohibits government subsidies that are contingent on export performance or use of domestic over imported products. Subsidies of this sort are prohibited regardless of whether they are applied generally or to specific industries and regardless of whether they are going to cause adverse effects to foreign competitors or not. Accordingly, subsidies made available for firms to use domestic low carbon-emitting products over foreign, high carbon-emitting

⁵ This paper focuses exclusively on the relationship between domestic climate policies and WTO rules (see also Assunção (2000)). For a discussion on the relationship between greenhouse gas emissions trading and WTO rules, see Zhang (1998), Parker (1998), Peterson (1999), Werksman (1999).

⁶ Subsidies could also contribute negatively to the environment. The typical example is energy and transport subsidies, which are widely considered to distort trade, and in most instances to cause environmental degradation. Thus, reforming energy and transport subsidies and getting the price right to reflect their production cost and environmental externality is the win-win strategy that first needs to be pursued in mitigating carbon emissions. For example, OECD (1997c) estimates that subsidy reform could deliver 1–8 per cent CO₂ emission reductions in the energy and electricity sector and 10–15 per cent emission reductions in the transport sector while improving economic welfare.

“like products” are considered GATT-illegal. A subsidy is actionable if it is granted to certain enterprises only and if it causes injury to the domestic industry of another member or serious prejudice to the interests of another member (Article 5 of the Subsidies Agreement). Put in another way, a subsidy is actionable if it is found either *de jure* or *de facto* specific and if it causes injury or serious prejudice to the economic interests of foreign competitors.

Let us first examine the specificity requirement. Under Article 2.1(a) of the Subsidies Agreement, a subsidy is considered *de jure* specific if only “certain” enterprises are eligible. Aimed at helping reduce carbon emissions, climate change-related subsidies are most likely to be granted to few energy-intensive sectors rather than made available economy-wide. Thus, they could be challenged under the *de jure* specificity requirement of the Subsidies Agreement. If they are found to be *de jure* specific, the specificity analysis terminates. However, even if they pass the *de jure* specificity test, they could still be considered specific under the *de facto* specificity if it is found that there is a predominant use or a disproportionate use of such subsidies. For example, in the case of Dutch Flowers, a subsidy scheme nominally available to all agricultural producers was found not *de jure* specific. But the subsidies received by horticulture firms were deemed *de facto* specific because horticulture received 50 per cent of the subsidy, while accounting for only 24 per cent of Dutch agricultural production (quoted in Parker (1998)).

Because the Subsidies Agreement is intentionally vague on how the “certain enterprises” is to be interpreted, to ascertain whether a subsidy is specific in practice or not requires a case-by-case analysis. Experience shows that this is not an easy matter. However, to determine the extent of injury that a subsidy might cause is even more difficult. Under Article 15.1 of the Subsidies Agreement, determination of injury is to be based on “positive evidence and involve an objective examination of both (a) the volume of the subsidized imports and the effect of the subsidized imports on prices in the domestic market for like products and (b) the consequent impact of these imports on the domestic producers of such products” (WTO, 1995). Although in practice providing the objective investigation of adverse effects is rather complicated, it would not prevent a country home to foreign competitor’s products from initiating a WTO dispute if it estimates that the subsidy impairs its market share or discriminates against its exports. It is indeed conceivable that in key economic sectors several of the subsidy schemes currently envisaged to reduce specific industries’ greenhouse gas emissions would run against WTO rules. Potential conflict with trade rules could then become a reality and a real obstacle to successful climate change policy and compliance with the Kyoto Protocol. This risk of conflict will be higher, depending on how relevant a certain sector is for Annex 1 Party emission reductions and how significant trade flows are in that specific sector.

Evidently, any discussion on subsidies and their potential conflict with WTO rules will need to be updated in response to ongoing trade negotiations of the Subsidies Agreement mandated by the WTO Doha Ministerial Declaration which was adopted on 14 November 2001. In this respect, even though one could argue that the Subsidies Agreement might be revised (including some of its current outstanding clauses that were to be renewed by WTO members in Seattle and in Doha) the discussion below remains relevant as domestic climate policies will undoubtedly make use of domestic subsidies to meet their Kyoto targets. Under the now-expired Article 8.2(c) of the Subsidies Agreement, there was a particular type of subsidy which would be non-actionable and consistent with WTO rules. Such sub-article constituted an exception allowing for a one-time subsidy introduced to offset increases in production costs of firms adjusting to new environmental regulations. However, and even in its now expired form, such an exception clause imposed limitations to the use of subsidies for climate change purposes. For example, the subsidy would need to be restricted to new equipment and investments and be limited to 20

per cent of the adaptation costs incurred.⁷ If re-instated in its original or in a modified form, this subsidy exception could be quite useful for mitigating economic effects of undertaking climate actions, particularly in helping domestic industrial firms to adjust to the “first shock” resulting from the Kyoto Protocol implementation. A concrete example could be a subsidy to encourage industry sectors to adopt new combined heat and power facilities, which have significant emissions reduction potential.⁸ Such a subsidy measure to increase industrial co-generation would be WTO-legal⁹ and at the same time, be a highly cost-effective means of reducing CO₂ emissions from industry. However, this kind of measure would be only one component of a country’s comprehensive greenhouse gas reduction strategy. Currently, there seems to exist a sort of gentleman’s agreement not to challenge this type of subsidies. With the imminent ratification of the Kyoto Protocol, it would be important to revisit the possibility of re-instating a similar exception clause in the Subsidies Agreement.

If and when WTO members acknowledge the fundamentally economic nature of the Climate Change Convention and its Kyoto Protocol, other types of non-actionable subsidies could be allowed, possibly through an interpretative statement, or re-instatement, of Article 8.2(c) of the Subsidies Agreement. The so-called *ex ante* approaches were proposed by some WTO members in the lead up to the WTO ministerial conferences at Singapore (December 1996) and Seattle (November 1999), to mean that rules and procedures are established to prevent a dispute from arising in the first place by amending the GATT or by adopting an Understanding on the interpretation of GATT (Ewing and Tarasofsky, 1997; Schwartz, 2000). In this respect, the fact should be highlighted that the negotiations on WTO rules under the Doha Round will be addressing the Subsidies Agreement and this could be an important and timely opportunity to ensure its compatibility with the Kyoto Protocol. Furthermore, it might be of great policy relevance to draft a non-binding Understanding on the interpretation of GATT Article 8.2(c) in its present or future form. Such an Understanding could help clarify for dispute resolution panels when subsidies are not actionable.

In addition to the above exception, Article 2.1(b) of the Subsidies Agreement allows for some additional flexibility regarding its stern specificity rule. Under the Article, a subsidy is considered not “specific”, hence not actionable, if there are objective and legally enforceable criteria governing eligibility for, and the amount of, the subsidy and if eligibility is automatic for any company meeting the criteria. These criteria or conditions need to be neutral, meaning that they would not favour certain firms over others, and be economic in nature and horizontal in application. It could be argued that if eligibility for, and the amount of, a subsidy were linked directly to concrete criteria – for example energy efficiency or intensity – the subsidy might not be considered “specific” even if it were only applied to one firm and industry, and therefore be perfectly consistent with WTO rules and climate change policies.

⁷ Under the now expired Article 8.2 (c) of the Subsidies Agreement, assistance to promote adaptation of existing facilities to new environmental requirements imposed by law is considered *non-sanctionable*, provided that it: (1) is a one-time non-recurring measure; (2) is limited to 20 per cent of the cost of adaptation; (3) does not cover the cost of replacing and operating the existing investment; (4) is directly linked and proportionate to environmental objectives and does not cover any resulting cost savings; and (5) is available to all firms which can adopt the new technology (WTO, 1995).

⁸ IPCC (1996) estimates that the adoption of co-generation could lead to annual CO₂ emissions by 2020 in the industrial sector 15 per cent less than what would otherwise have occurred.

⁹ In this regard, it is worth mentioning state aid under Article 87 of the European Commission (EC). In order to ensure the proper functioning of the Internal Market and true competition, the general Commission’s policy is to forbid all kinds of state aid. However, in the document “Community Guidelines on State Aid for Environmental Protection” recently released by the Commission, supports for co-generation and renewables are exempt from the general state aid regime within certain limits, thus effectively allowing the use of support schemes for these technologies (Gogen Europe, 2001).

Moreover, Annex 1 Parties may seek to support efforts by their industries to develop climate-friendly products and technologies through joint research and development projects like the United States Clean Car Initiative or incentive programs such as the United States “Golden Carrot” awards.¹⁰ Within certain limits specified under Article 8.2(a) of the Subsidies Agreement, such research assistance is permitted by the WTO subsidy rules, although typically such measures do not seem to be too effective in terms of the amount of greenhouse gas emissions abated.¹¹

From the preceding discussion, it would appear that there is a clear need for close scrutiny of WTO rules when Annex 1 Parties to the Kyoto Protocol formulate their climate change measures, particularly if they are also global players in the multilateral trading system. No doubt, a number of thorny cases will haunt policy makers during the Kyoto Protocol compliance phase. The first hypothetical case signals the possibility of an importing country imposing countervailing duties on exports from a country which introduced subsidies in some of its manufacturing sectors to reduce greenhouse gas emissions occurring in the production process of these exports. For example, if a subsidy were granted to a less carbon-intensive fossil fuel, the products produced using that fossil fuel (in its production process) might be considered subsidized. From a WTO perspective, countries without an indigenous supply of either that fossil fuel or the subsidized product that uses it are unlikely to complain of such subsidies when importing either the fossil fuel or the subsidized product. However, countries that have domestic producers of that fossil fuel or the subsidized product may impose countervailing duties to protect their industries. This raises the question whether the use of countervailing duties would be the most appropriate solution in such cases or whether a special exception should be carved out for multilaterally-agreed and non-discriminatory climate change measures. Some analysts argue that it might be unlikely that a subsidy on the embodied energy used in producing a product would make such a product countervailable under WTO rules.

The second case relates to the lack of meaningful environmental rules in an exporting country, and the resulting “unfair import competition” perceived by the importing country. Under Article 1.1 of the Subsidies Agreement, a subsidy is defined as including “government revenue that is otherwise due is foregone or not collected” (WTO, 1995). Although a narrow interpretation of this clause would limit claims to cases in which taxes are levied but not collected, its broad interpretation would expose the absence of environmental taxes or regulations to charges of unfair subsidization (Esty, 1994). So importing countries could claim that the absence of climate change policies in their trading partners would be equivalent to giving an implicit unfair export subsidies biased towards their energy-intensive sectors (the so-called ecological dumping), because the costs of environmental degradation are not part of the prices of those exported products. Let alone whether such an interpretation of lax environmental regulation as a countervailable subsidy is acceptable,¹² imposing countervailing duties on this ground poses a “slippery slope” problem of where to draw an appropriate line in distinguishing desirable “like

¹⁰ In the United States “Golden Carrot” program, utilities offer financial incentives for manufacturers to make major advances in energy efficiency and product performance. In the first scheme, 24 utilities pooled US\$30 million in the Super Efficient Refrigerator Program and a competition was launched to find the manufacturer who could build the most efficient CFC-free refrigerator at the lowest cost. The winner received guaranteed rebates from the pool to offset the incremental product development cost. Fourteen manufacturers responded to the challenge by submitting proposals. As a result of the competition, several of the manufacturers, although they failed to win the competition, have introduced efficiency improvements to their standard commercial models (CTI, 1998).

¹¹ See UNFCCC (1996) report on the in-depth review of the national communication of United States of America.

¹² Since environmental concerns were simply not a public issue in 1947 when GATT was signed, exploring the environmental exceptions to the general free trade requirements in GATT depends as much on interpretation as on the actual clauses (Charnovitz, 1991). Given the fact that a three-fourths vote of the entire membership is required for the membership to adopt legal interpretation of any WTO agreement (WTO, 1995), the above interpretation might stand little chance of being accepted.

products” from unacceptable non-product related PPMs (processes and production methods) without opening the door to unacceptable abuses (Jackson, 1992, 2000; Schoenbaum, 1997).¹³ Similarly, an exporting country may claim that the absence of climate change policies in an importing country poses *de facto* a competitiveness barrier to its export, and thus could be seen as an effective protectionist device.

The existing WTO rules on subsidies are much needed for a variety of reasons and changing them may be undesirable. Close scrutiny of WTO rules is a necessary and imperative condition in order to avoid of trade conflicts that result from Kyoto Protocol implementation; but it may not be sufficient. In this regard, further analytical work to clarify the complex situations arising from the climate change regime and its interface with the multilateral trade regime is required.

III. ENERGY EFFICIENCY STANDARDS

Standards refer to regulations stipulating, for example, the minimum energy efficiency standards for products. Standards of this sort are set by governments and are usually mandatory. Given that the perceived political costs of introducing standards are much lower than the costs of the introduction or raising of energy taxation, energy efficiency standards may be seen as more attractive and feasible (Brack et al, 2000). Thus, it is conceivable that in attempting to fulfil their Kyoto obligations, Annex 1 governments may set high energy efficiency standards for products, such as automobiles sold in their countries, either domestically produced or imported. The result would be less energy consumed and fewer energy-related greenhouse gas emissions emitted into the atmosphere.

In principle, this practice would not infringe on WTO rules if applied consistently with the principle of national treatment. Nevertheless, problems could arise if such regulations were designed in such a way as to effectively penalize foreign firms in favour of domestic ones. A potentially serious conflict has erupted in the context of fuel efficiency standards proposed by the Japanese Ministry of Transport to control CO₂ emissions, allegedly as part of Japan’s policy to meet its Kyoto commitments. Such a proposal suggested lowering the rates of two of the eight taxes currently applied to vehicles in Japan for vehicles of small engine size and high fuel efficiency. In December 1998, European Union officials said that they would challenge Japan in the WTO if such new emission standards were implemented. Europeans carmakers claim that standards are actually based on the weight of vehicles, and that almost 90 per cent of European car sales in Japan fell into the medium- to heavyweight categories. Thus, in their view the planned Japanese rules could severely affect exports of European Union medium-range and luxury cars to the Japanese market, precisely a market segment where Europeans have a comparative advantage. At the same time, Japanese cars with higher fuel consumption rates would easily meet the standards.¹⁴ On 11 January 1999, Japan pursued the issue

¹³ In dealing with the whole PPMs controversy, a distinction is drawn between product-related PPMs and non-product related PPMs. Product-related PPMs refer to the characteristics of the final product, for example, the environmental impact of a product when it is used or disposed, whereas non-product related PPMs refer to the characteristics of the processes or methods in manufacturing a product or providing a service (OECD, 1997b). Discrimination based on how a product is produced has traditionally had a rough ride in the WTO. Under WTO rules, an imported product is not allowed to be treated differently to a “like product” (i.e. a product with the same physical characteristics) produced domestically, only on the ground of process and production method employed to produce the product.

¹⁴ See European Carmakers to Challenge Japan at WTO, *Journal of Commerce*, 22 December 1998; and BRIDGES Weekly Trade News Digest, Vol. 3, Nos. 1 and 2, 18 January 1999, International Centre for Trade and Sustainable Development, Geneva.

further by notifying the WTO Agreement on Technical Barriers to Trade (TBT) Committee, indicating that by April 1999 it would introduce new energy efficiency standards for passenger cars.¹⁵ Japan justified the measure as a means of promoting energy efficiency in order to cope with rising energy consumption and climate change concerns. It is worthy to mention that this potential “friction” between Japan and the European Union happened at the time when neither had ratified the Kyoto Protocol. Both parties ratified in May 2002.

In principle, WTO rules do not allow the unilateral setting of standards that are more trade-restrictive than necessary. Article 2.2 of the TBT Agreement, for example, requires that technical regulations affecting imported products not be “prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade”.¹⁶ If, however, regulations are “not more trade-restrictive than necessary to fulfil a legitimate objective”, they *may* be allowed under the TBT Agreement. Article 2.2 of the TBT Agreement offers some flexibility to regulations introduced pursuant to a few “legitimate objectives”, which are defined as including “national security requirements, prevention of deceptive practices, protection of human health or safety, animal or plant life or health, or the environment” (WTO, 1995). The question then would be to prove that a specific regulation is the least-trade restrictive and necessary to combat climate change. This could be done by, for example, establishing multilaterally agreed energy efficiency standards, given that Article 2.5 of the TBT Agreement states that a regulation is presumed not to contain any unnecessary obstacles to international trade if it is established in accordance with “relevant international standards”.

Looking into a concrete dispute may help to further clarify the interpretation of the WTO-consistency. In the “Auto Taxes Panel” raised under the GATT, the European Union challenged the United States Corporate Average Fuel Economy (CAFE) requirements (1994) and the United States “gas guzzler tax” on the basis that these laws had an adverse impact on European Union car manufacturers. CAFE penalizes car manufacturers that do not meet average efficiency standards for their sales in the United States. The gas-guzzler tax is levied on car models with fuel consumption levels below 22.5 miles per gallon. Both laws allow manufacturers to do some averaging, which arguably allows United States manufacturers to avoid the tax.¹⁷ Given the limited lines of luxury models built by many European manufacturers, European carmakers would be unable to take full advantage of the averaging provisions and would as a result have been penalized and taxed.

The panel upheld the gas-guzzler tax because it was applied equally to all cars, regardless of where they were manufactured, but not the CAFE standards. In analyzing the gas-guzzler tax, the panel did not consider cars which could run more than 22.5 miles per gallon as “like” cars to those that consume more and run under 22.5 miles per gallon, hence they could be treated differently under Article III of the GATT. On this, some analysts (e.g. Goldberg, 1995) think that this could “suggest that, in the future, trade restrictions that discriminate between products based on their energy efficiency should not conflict with the WTO rules”.¹⁸

¹⁵ See WTO TBT Notification G/TBT/Notif.99.3, 11 January 1999.

¹⁶ Under Article 2.2 of the TBT Agreement, to ensure technical regulations do not create unnecessary obstacles to international trade, technical regulations must “not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create” (WTO, 1995).

¹⁷ CAFE allows manufacturers to average across their full product line. The gas guzzler tax allows manufacturers to average the fuel efficiency of cars within a “model type”, i.e. those with the same chassis and engine size.

¹⁸ However, this should be interpreted with great caution because “GATT and WTO panels are not bound by previous panel decisions and have been known to reach diametrically opposite conclusions about identical matters” (Goldberg, 1995).

In this panel ruling, it appears that “the panel seemed most concerned about the creation of categories of products based on origin and ownership. Thus, although foreign and domestic cars arguably are treated the same (or at least in parallel fashion), and despite the fact that the panel could not demonstrate that foreign cars suffer a greater disadvantage under the law than domestic cars, it found that the CAFE law violates GATT” (Goldberg, 1995) since it is specific to foreign cars sold in the United States market. The lesson for future unilateral measures is simple: distinctions based on a product’s origin, ownership, manufacturer, or importer should be avoided. It appears from the Auto Taxes case that there could be many WTO-consistent trade measures that a country can adopt unilaterally to implement its Kyoto Protocol commitments. The main question boils down to whether such measures are designed for, or result in, a discriminatory protection of domestic production. If they do not, they would not transgress WTO rules.

An alternative and less conflicting route other than unilateral measures in order to comply with Kyoto Protocol targets is the implementation of energy efficiency standards by Annex 1 Parties in concert.¹⁹ From a trade perspective, a harmonized approach is clearly advantageous. First, harmonized measures are less likely to be discriminatory, at least between the Parties involved since negotiators would seek to make them trade-neutral to gain the maximum number of adherents to the agreement. Goldberg (1995) argues however that “the history of the CAFE law suggests that the requirement of trade neutrality could make implementation by national legislatures more difficult”. Second, future WTO panels may favour regulations or standards that are explicitly mandated and multilaterally agreed upon by the post-Kyoto climate change regime.²⁰ Indeed, as was discussed, Article 2.5 of the TBT Agreement provides that a technical regulation which is adopted in accordance with a relevant international standard “shall be presumed not to create an unnecessary obstacle to international trade”.

The attraction to harmonized energy efficiency standards is evident. The harmonization of standards would lower the costs of information on, and adjustments to, different requirements involved in exporting to different markets (OECD, 1996).²¹ However, experience shows that the negotiation of international standards is usually a long, if not fruitless process which require considerable application. For example, in the European Union measures to promote energy efficiency have been under serious discussion since mid-1970s, but only in the early 1990s did the European Union succeed in introducing energy labelling, and the first energy efficiency standards are only now beginning to enter into force

¹⁹ To some extent, the UNFCCC already requires such a harmonization. Specifically, Article 4.2(e)(i) requires Parties to coordinate their economic and administrative instruments *as appropriate*. However, it is not clear how strong this mandate is. It seems unlikely that it provides a basis to challenge unilateral measures like the United States CAFE standards or the above Japanese proposal for fuel efficiency standards for vehicles.

²⁰ In this regard, it is worth mentioning the recent Shrimp-Turtle dispute. To address the decline of sea turtles around the world, in 1989 the United States Congress enacted Section 609 of Public Law 101-162 to authorize embargoes on shrimp harvested with commercial fishing technology harmful to sea turtles. The United States was challenged in the WTO by India, Malaysia, Pakistan and Thailand in October 1996, after embargoes were levelled against them. A WTO Dispute Settlement Panel was established in April 1997 to hear the case. The Panel found that the United States failed to approach the complainant nations in serious multilateral negotiations before enforcing the United States law against those nations, and thus ruled against the United States. The United States appealed the ruling. The WTO Appellate Body reiterated this concern, and pointed to a 1996 regional agreement reached at the United States initiation, namely the Inter-American Convention on Protection and Conservation of Sea Turtles, as evidence of the feasibility of such an approach (WTO, 1998; Berger, 1999). Here, the Appellate Body again advanced the standing of multilateral environmental treaties. Thus, it follows that this and other existing trade disputes at the WTO have indicated clear preference for actions taken pursuant to multilateral agreement and negotiated through international cooperative arrangements, like the Kyoto Protocol in the case of dealing with the global climate change problem.

²¹ For example, the development of energy efficiency standards in the United States has been led by individual states (particularly California). After a number of states had introduced such standards, the manufacturers tended to accept the need to produce more efficient products, and indeed in some cases started to support the development of harmonized federal standards so as to avoid the administrative costs and complexity of meeting different requirements in different states (Brack et al., 1999).

(Brack et al., 1999). Even for an optimistic estimate, the time needed for research, to plan and negotiate common standards at Annex 1 country level could take about 5 years (Mullins, 1996). Moreover, common standards may not always be appropriate for different countries. If it is difficult for European Union member countries at comparable economic and technological levels to harmonize their energy standards, the prospects for the harmonization of energy efficiency standards among Annex 1 countries seem remote. Even if common standards had eventually been internationally established, they are expected to be driven down towards the lowest common denominator among the countries involved. Annex 1 Parties would, nevertheless, be entitled under Article 2.4 of the TBT Agreement to set their own higher standards if they are able to prove that international standards would be inappropriate to achieve the targeted climate objective.

Alternatively, instead of attempting the wide-ranging harmonization of performance standards, a strategy of harmonizing procedural standards could be pursued. Such a strategy would attempt to set internationally agreed guidelines which need to be respected when defining performance standards. The ISO 14000 series of environmental management standards is a good example of voluntary procedural standards. In our view, the case for attempting to harmonize procedural standards is much stronger.

IV. ECO-LABELS

Eco-labelling refers to the use of a seal on a product to identify it as environmentally preferable to its alternative in the same category. Its purpose is to promote the production, consumption and disposal of more environmentally friendly products. Eco-labelling gives the consumer the choice of whether to buy a product contributing to environmental degradation or to buy more environmentally friendly alternative. As a consequence, producers are encouraged to apply for the eco-label in order to avoid losing market share. By certifying that certain products involve exceptionally low greenhouse gas emissions in their production process, eco-labelling would provide governments with a useful tool to use consumer preference to help meet their Kyoto emissions targets.

Its voluntary nature makes eco-labelling an attractive alternative to costly regulatory measures. Existing eco-labelling schemes are usually designed to apply to a small percentage of products in a product category, which represent no more than 30 per cent and no less than 5 per cent of the market share (OECD, 1997a). These schemes indicate the overall environmental qualities of such eco-labelled products in order to encourage consumers to purchase them. Once a large proportion of products within a group are eco-labelled, the criteria for eco-labelling should be revised to increase their stringency of environmental quality. All previous eco-labelled products have to apply for the eco-label once again, and only those that meet the new revised criteria can remain eco-labelled. This constant upward revision of environmental criteria is considered essential to ensure continuously improved environmental performance (OECD, 1997a).

The eco-label criteria for such schemes as the German Blue Angel, the Japanese Eco-Mark, and the Canadian Environmental Choice Programme aim generally to promote products that reduce environmental damages during the use and disposal phases of the products (OECD, 1997a). However, given that eco-labels are increasingly based on a life-cycle analysis of environmental effects of products from cradle to grave that may contain process and production related criteria, their rapid

spread has rightfully given rise to fears and concerns, especially amongst developing countries, about their potential trade effects.

One trade aspect of particular concern refers to the use of distinctions between products based on their PPMs. From the international trade perspective, distinctions based on how a product is produced bring up the question of whether such eco-labels are covered by the TBT Agreement, or are in effect a technical regulation. Since eco-labels are considered to be voluntary standards, it can be said that eco-labels are subject to the provisions of the TBT Agreement on standards. In this case, climate change-related eco-labels would need to adhere to the WTO's Code of Good Practice, which governs the preparation, adoption and application of such standards. Although some trade analysts (e.g. Tietje, 1995) argue that the TBT Agreement covers only standards that concern product characteristics and incorporated PPMs, there is a continuing controversy in the WTO on whether the TBT Agreement covers unincorporated PPMs – those that are not reflected in final product characteristics (OECD, 1996; Assunção, 1998a; Cosby and Cameron, 1999).

Another concern relates to the determinations of the category of eco-labelled products, and the procedures of establishing eco-labels. In selecting eco-labelled products, it is likely that the country establishing the eco-label scheme could favour domestic producers by failing to include similar or competing products from foreign producers, thus placing imports at a comparative disadvantage vis-à-vis the domestic products. Similarly, in developing eco-labels criteria, the country does not take into consideration the environmental conditions and preferences of the exporting countries. For instance, the relative abundance of environmental endowment in the foreign producer's country may be more capable of assimilating a given quantity of pollution than the environment of the importing country that establishes the eco-label scheme, although the impact of producing such products on the environment of the producer's country is perfectly acceptable. Consequently, the eco-label may constitute a *de facto* non-tariff barrier for the foreign products that do not comply with the eco-label criteria to get access to the importing country market. This market access barrier may be particularly worrisome and detrimental to developing countries because they often do not have the technical or financial capacity to adapt their PPMs to those required in the importing countries. In fact, this was cited as causing potential trade barriers to products produced in developing countries by a number of parties (including India, the Republic of Korea, Morocco and Egypt) in the negotiations on the Kyoto Protocol. Again wary countries like Egypt see eco-labels as part of the market access question when the European Union and other nations were pushing for the inclusion of eco-labelling on the post-Doha agenda of the Doha Ministerial Declaration.

To date, the only eco-labels that have been developed for product categories of particular export interest to developing countries are the eco-labels for textiles (OECD, 1997a). For example, the Nordic Swan and the European Union eco-label for textiles contain criteria on the manufacturing process, such as the use of pesticides in the growing of cotton and the use of harmful substances during the process. Given the fact that developing countries have not committed themselves to legally binding greenhouse gas emissions targets as their developed counterparts have done, developed countries might use an eco-label as the criterion to purchase products from developing countries in the future. Consequently, this limited coverage of products of particular export interest to developing countries may change. This, combined with lack of participation and consultation of developing countries when eco-labelled products are selected and criteria for eco-labelling are established, could adversely affect developing countries' ability to export their products to developed countries. This shows again that the implementation of the Kyoto Protocol will most likely be a significant source of trade concerns.

V. GOVERNMENT PROCUREMENT

Among OECD member countries, government procurement expenditures involve extremely diverse products and services and account for 8 to 25 per cent of GDP (OECD, 2000). The potential for public purchasing decisions to affect the environment is therefore considerable. By supporting innovation in, and purchasing environmentally preferable products and services government procurement potentially plays a crucial role in achieving reductions in greenhouse gas emissions. This explains why those committed to effective climate change policies generally support greener public purchasing.

Trade issues, in general should not be expected to arise in the “greening” of public purchasing, provided that the principles of transparency, non-discrimination and national treatment are fully respected. However, given that in practice public procurement differs widely among countries, there are concerns that green public purchasing schemes could add an extra layer of complexity to purchasing decisions, therefore reducing transparency and distorting free competition (Cameron and Buck, 1998; OECD, 1999). From this perspective, green public purchasing schemes could provide a pretext for undermining the WTO rules.

In order to green public purchases, the environmental characteristics of the products to be procured have first to be technically specified.²² Thus, specifying such characteristics is an essential part of any tendering process. Concerns about trade effects are raised with respect to differential treatment between local and foreign suppliers in the specifications in tenders. For example, by emphasizing recycled content in the specifications in tenders for paper purchases, the criteria could favour domestic producers who are predominately based on recycled content over foreign producers whose products have a higher virgin paper content. Another example relates to transport-related specifications in tenders, e.g. specifying the mode of freight or limits on emissions for delivering tendered products, the local purchasing entities gives a preference for locally produced products. Although this practice is not yet widespread, it is potentially relevant to trade policy concerns given the trend towards decentralization of purchasing decisions.

Another trade aspect of particular concern is the fact that government procurement-related purchasing specifications often include production-related requirements. The national treatment provisions prohibit differentiation between otherwise “like products” on the basis of PPM-related

²² In this regard, a distinction can be drawn between negative and positive approaches to the framing of specifications. Negative approaches aim to specify what are currently in use to eliminate those specifications that effectively hamper efforts to procure environmentally preferable products and services. By contrast, positive approaches aim to identify certain characteristics of products and services to ensure that procurement officers choose environmentally preferable ones over less environmentally preferable ones (Cameron and Buck, 1998).

requirements (OECD, 1995).²³ Thus, if a government treats differently imports that emit more greenhouse gas emissions in their production than their like domestic products, it could face a sanction under the WTO rules. A case in point would be the preference for electricity generated from hydropower and discrimination against those from coal-fired power. It is worth noting that the main body of international rules and procedures governing the relationship between green government procurement and free trade is currently found in the Agreement on Government Procurement 1994 (AGP). The AGP is one of the plurilateral agreements included in Annex 4 to the Agreement Establishing the WTO. Consequently, WTO signatories are not required to join the AGP as a precondition to WTO membership. Because the AGP is an agreement outside the WTO rules, however, it is still a matter of debate whether the AGP can allow distinguishing products and services to be procured based on their non-product related PPMs. Some analysts, for example, Cameron and Buck (1998), have argued that the wording of Article VI.1 of the AGP does not explicitly exclude the use of technical specifications that make reference to non-product related PPMs. Moreover, they think that reference to non-product related PPMs would be in line with Article VI.2(a) of the AGP, as technical specifications that refer to certain aspects of the life-cycle performance of a product or service are likely to be in terms of performance rather than design. If the reasoning held, public procurement based on, e.g. the maximal energy consumption or the overall greenhouse gas emissions during the life cycle of a product would be allowed. Other analysts add that as the AGP has only a very limited partnership, it could be modified to reflect “climate change” considerations.

The third aspect of trade concern is related to the practice of using eco-labels to designate environmentally preferable products for public procurement. Experience shows that public procurement has given a strong impetus to the increasing success of the eco-label schemes, such as the German Blue Angel (OECD, 1997a). Given that purchasing officers have mostly neither the time nor the expertise to gather all the information needed to substantiate specifications, it is relatively easy to refer to existing eco-labels (i.e. design the greener products with an existing eco-label). But such a practice raises concerns about the possible over-reliance on eco-labels at the expense of objective consideration of underlying criteria (OECD, 1999). Where adherence to an eco-labelling scheme is specified in tender documentation, the compliance costs associated with qualifying for the eco-label might be higher for foreign firms, especially for small and medium-size enterprises in developing countries. Moreover, the inability of producers to ensure that the materials used are produced in accordance with the eco-label criteria may present further hurdles for the participation of foreign producers in a public tender (OECD, 1999).²⁴ In order not to reduce the chances of purchasing

²³ In the above-mentioned Shrimp-Turtle dispute, the Dispute Settlement Panel held that the United States shrimp embargo was a class of measures of PPMs type and had a serious threat to the multilateral trading system because it conditioned market access on the conservation policies of foreign countries. Thus, it cannot be justified under GATT Article XX. However, the WTO Appellate Body overruled the Panel’s reasoning. The Appellate Body held that a WTO member requires from exporting countries compliance, or adoption of, certain policies prescribed by the importing country does not render the measure inconsistent with the WTO obligation. Although the Appellate Body still found that the United States shrimp embargo was not justified under GATT Article XX, the decision was not on ground that the United States sea turtle law itself was not inconsistent with GATT. Rather, the ruling was on ground that the application of the law constituted “arbitrary and unjustifiable discrimination” between WTO members (WTO, 1998). Therefore, some analysts (e.g. Ahn, 1999) suggest that the Appellate Body’s ruling implies that requiring other WTO members to adopt a comparable regulatory program may not be inconsistent per se with the WTO obligation. It should be pointed out, though, that there is no universally accepted interpretation of the Appellate Body decision (IPCC, 2001). Other analysts (e.g. Jackson, 2000) argue that such a conclusion that PPMs no longer violate WTO by their very nature is premature legally or has been insufficiently debated and tested in the scientific literature.

²⁴ A study on the impacts of the EU eco-labelling scheme on Brazilian exports of textiles found that there was the severe difficulty complying with the criteria for the use of pesticides during the manufacturing process (OECD, 1997a). Although the use of pesticides in cotton grown in Brazil is low, the imports of cotton are increasing. It is very difficult for Brazilian textile producers to certify that the cotton they import was not manufactured with the use of pesticides.

imported products, the purchasing authorities should encourage to use the eco-label's underlying criteria and information gathered on the particular environmental reference points, rather than the eco-labels themselves. In other words, eco-labels are regarded as an additional source of information, not as a pre-requisite for participation in government procurement.

Fourth, trade concerns would emerge if the procurement rules require the suppliers' green credentials as a condition for participating in government procurement bids. The United States Departments of Energy and Defense have been cited as considering ISO 14001 certification as a prerequisite for qualifying suppliers (UNCTAD, 1997). If the eligibility for a supplier to sell to a public entity is conditional on its compliance with an environmental management system, whether ISO 14001 or EMAS (the European Union Eco-audit and Management Scheme), this might be considered to amount to differential treatment of what are in fact "like products" (OECD, 1999). There are two ways to avoid potential trade effects of the specification. The first approach is that the purchaser may refer to, or demand adherence to, the specified environmental management standards, but may not do without adding "or equivalent". Another approach is to apply the greener criteria only to products themselves, without reference to the environmental credentials of potential suppliers. It should be pointed out that environmental management systems are just standards on company practices. A company having a certified environmental management system does not necessarily mean that its products are greener than those not having such a certification. From this perspective, conditioning the suppliers' eligibility to participate in government procurement bids on their green credentials may lead to the choice of high carbon-emitting products from the suppliers complying with an environmental management system over low carbon-emitting "like products" from those not having a certified environmental management system.

VI. CARBON TAX AND ITS IMPLICATIONS FOR INTERNATIONAL COMPETITIVENESS

In recent years, both the European Union and the United States attempted to implement a carbon tax, raising the price of energy to incorporate the costs of environmental externalities associated with its use, and both failed. But there is no doubt that compliance with the Kyoto emissions reduction targets might make many developed countries have a second thought on this option.

By definition, a carbon tax is an excise tax imposed on the carbon emitted in the manufacturing process of a product according to the carbon content of fossil fuels and is thus restricted to carbon-based fuels only. If the goal is to reduce CO₂ emissions, a carbon tax is preferred to an energy tax due to its greater cost-effectiveness (Zhang, 1997). The reason is that a carbon tax equalizes the marginal cost of CO₂ abatement across fuels and therefore satisfies the condition for minimizing the global cost of reducing CO₂ emissions. This implies that implementation of an energy tax will lead to poor target achievement or else to unnecessarily high costs as compared with a carbon tax.²⁵

If imposed unilaterally, a carbon tax would raise the prices of energy and of those products whose production gives rise to the large amount of CO₂ emissions, and thus has potentially important implications for the international competitiveness of domestic products, particularly energy-intensive

²⁵ Please note that a Carbon tax can be easily converted into a CO₂ tax, given the fact that a tonne of Carbon corresponds to 3.67 tonnes of CO₂.

products. Although international competitiveness is not necessarily reduced over the long term by higher energy prices, in certain industries, the effects of introducing a unilateral carbon tax may indeed be serious in the short term. This is so because it imposes a “penalty” on domestic producers who could face imports that may not have such a tax levied on them, while at the same time having to compete with similarly untaxed products on the international market. Although one solution could be to impose the tax on imports at the border and refund on exports, this issue has become the main stumbling block for the introduction of energy/carbon taxes (Barde, 1997), and thus has been a constant concern to policy makers.

Generally speaking, competitiveness at the firm level is the ability of a firm to maintain or even increase international or domestic market shares and profitability.²⁶ A firm’s competitiveness is influenced both by ‘micro’ factors, such as cost structure, product quality, trademark, service and logistical networks, and by ‘macro’ factors, such as exchange rates, trade rules and political regime stability (Baron and ECON-Energy, 1997). A carbon tax affects a firm’s competitiveness by changing its relative production costs. For example, if a firm makes intensive use of energy, *ceteris paribus*, then imposing a carbon tax will increase its production cost relative to those less energy-intensive firms in the short term. Thus, it would experience a decline in competitiveness, whereas less energy-intensive firms would obtain a relative cost advantage in the short term. The changes in relative competitive positions would lead to ‘winners’ as well as ‘losers’ from the imposition of carbon/energy tax. Not surprisingly, potential ‘losers’ lobby strongly against the imposition of carbon/energy taxes. They even threaten to relocate their business activities to those countries that have relatively lax environmental standards, if such a tax were put in place. This raises the question: do environmental taxes and regulations hurt firms’ competitiveness so badly that they are forced to move to pollution havens? There is growing literature on this topic, and the existing studies on trade implications of environmental regulations might give us some indications.

Grossman and Krueger (1993), for example, have examined whether pollution abatement costs influenced the patterns of the United States bilateral trade and investment with Mexico and found that “the available evidence does not support the hypothesis that cross-country differences in environmental standards are an important determinant of the global patterns of international trade.” Jaffe et al. (1995) review and analyse over 100 studies on the potential effects of environmental regulations on the competitiveness of American industry, and conclude that “studies attempting to measure the effect of environmental regulation on net exports, overall trade flows, and plant-location decisions have produced estimates that are either small, statistically insignificant or not robust to tests of model specification.”. The Annex 1 Expert Group on the UNFCCC (Baron and ECON-Energy, 1997) undertook a static analysis of the cost increases from a tax of US\$100 per tonne of carbon on four energy-intensive industries (iron and steel, non-ferrous metals, paper and pulp, and chemical products) in the OECD countries. These sectors represent 3 to 7 per cent of GDP and 1 to 4 per cent of labour force in these countries. As shown in table 1, the average cost increase measured as percentage of total production value differs among countries and sectors, but is generally low (below 2 per cent) except for Australia and Canada. This analysis concludes that other factors affecting price levels, such as exchange rate variations, may well dwarf the price effects of a carbon tax, at least at the rates that are generally proposed in current debates on climate change policy.

²⁶ For a discussion of trade competitiveness impacts at the firm level, see Assunção (1998b).

Table 1
Selected OECD countries' cost increase^a from a tax of US\$100 per tonne of carbon
as percentage of production value

	<i>Total energy-intensive industries</i>	<i>Iron and steel</i>	<i>Non-ferrous metals</i>	<i>Chemical products</i>	<i>Pulp and paper</i>
United States	2.8 (2.5)	2.3	3.1	2.8 (2.2)	3.2
Canada	4.1 (4.3)	6.2	3.7	4.1 (2.3)	5.0
Japan	1.2 (1.0)	2.0	0.7	1.0 (0.6)	0.6
Australia	5.2 (5.0)	5.8	11.4	1.7 (1.4)	2.6
France	1.4 (1.1)	2.4	1.4	1.3 (0.8)	0.6
Germany	1.6 (1.4)	2.6	1.2	1.4 (1.1)	1.0
United Kingdom	1.6 (1.3)	3.6	1.9	1.2 (0.8)	1.2
Italy	1.4 (1.2)	2.0	1.1	1.3 (0.9)	0.7
Belgium	2.3 (2.1)	7.3	0.8	1.6 (1.2)	0.6

Source: Baron and ECON-Energy (1997).

a The figures include carbon emissions from electricity generation sector and from process emissions in aluminium production. Numbers in parentheses indicate cost increase when the carbon tax is applied only to fossil fuels used for energy purposes.

Table 2
Effective and nominal tax rates (1998) in selected sectors in Sweden, Denmark and Norway
(ECU per tonne of CO₂ emissions, 1 ECU = US\$1.12)

<i>Energy products</i>	<i>Sweden (Nominal)</i>	<i>Denmark (Nominal)</i>		<i>Norway (Nominal)</i>
	<i>Manufacturing industry</i>	<i>Light processes</i>	<i>Heavy processes</i>	<i>Pulp/paper industry</i>
Gas oil (heating)	20.9 (41.9)	11.2 (12.5)	3.1 (12.5)	9.9 (19.9)
Heavy fuel oil	18.8 (37.7)	11.6 (12.8)	3.2 (12.8)	8.8 (17.6)
LPG	20.2 (40.4)	11.5 (12.8)	3.2 (12.8)	0 (0)
Coal	21.5 (43)	11.9 (13.2)	3.3 (13.2)	23.4 (23.4)
Natural gas	19.3 (38.5)	11.3 (12.5)	3.1 (12.5)	0 (48.8)

Source: Baranzini et al. (2000).

However, these findings are not necessarily going to be the case of energy/carbon taxes in the future for the following reasons.

First, environmental regulations and taxes applied to date have been relatively modest, and they fall well short of the levels required to achieve the UNFCCC's ultimate objective of "stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". That is, if carbon taxes were used as the sole means of meeting the Kyoto emissions obligations, the level of the taxes would be very high and could thus have significant implications for competitiveness.

Second, in countries, such as Denmark, Norway and Sweden where carbon/energy taxes are already applied, energy-intensive industries are generally exempted, either totally or partially, from such taxes. This leads to a large gap between effective and nominal tax rates as shown in table 2. Moreover, even if not totally exempted, the revenues from such taxes are fully recycled back to the affected industries, for example, in the form of grants for energy saving investments and cuts in employers' social security contributions (cf. Baranzini et al., 2000).

The analysis of potentially high carbon taxes underlines the importance of mitigating their competitiveness effects in designing such taxes. One commonly used device is to grant energy-intensive industries a lower tax rate than for example households, or even to exempt these industries entirely. For example, the unimplemented CEC (1992) proposal²⁷ provided for exemptions for the six energy-intensive industries, such as iron and steel, non-ferrous metals, chemicals, cement, glass, and pulp and paper. However, since a carbon tax is intended to fall most heavily on the products of carbon-intensive industries, the exclusion of these industries from coverage of the carbon tax on the ground of competitiveness reduces the effectiveness of the carbon tax in achieving its intended objective of reducing CO₂ emissions.

Another means to reduce adverse competitiveness effects is through border tax adjustments (BTAs) whereby exporting countries rebate taxes levied on the products when these are exported, while the importing countries impose the taxes on imported products at the border that have not been subjected to a similar level of taxes levied on their domestic products. Such adjustments enable a country to tax its domestic energy-consuming industries for internal purposes while preserving its competitiveness internationally. It also allows its exports to compete in untaxed markets abroad, while ensuring their competitive advantages domestically by taxing imports up to the same level. This kind of BTAs reflects the application to products of the destination principle, which suggests that products should be taxed in the country where they are consumed and not in the country where they are produced unless they are also consumed there.

From a WTO perspective, BTAs, if adopted, should not be used to provide an artificial competitive advantage for domestic products. Thus, border taxes should not be in excess of taxes on "like products" manufactured and sold domestically. Clearly, such adjustments are intended to ensure that internal taxes on products are trade-neutral. BTAs have been used in the United States in two

²⁷ As part of its comprehensive strategy to control CO₂ emissions and increase energy efficiency, the European Commission proposed as early as in 1992 that member states introduce a carbon/energy tax of US\$3 per barrel oil equivalent in 1993, which would be raised in real terms by US\$1 every year to reach US\$10 per barrel in 2000. After, the tax rate would remain constant at US\$10 per barrel at 1993 prices. The tax rates were allocated across fuels, with 50 per cent based on carbon content and 50 per cent on energy content (CEC, 1992).

important instances of environmental excise taxes: the Superfund Chemical Exercises (Superfund Tax) and the Ozone-Depleting Chemicals (ODC) Tax. With a modest rate of US\$4.87 per tonne, the Superfund Tax was designed to place the burden of such cleanup on those responsible for generating wastes, but was not intended to influence behaviour through the price system. On the other hand, the ODC Tax aimed to harness market forces to promote the identification of substitutes for the taxed chemicals, and thus was intended to influence behaviour through the price system. This BTA policy turned out to be effective both in raising the price of taxed chemicals and in discouraging their production (Hoerner, 1998).

When considering BTAs for carbon taxes, it is necessary to distinguish between energy products (e.g. coal, oil, and gas) from final products (e.g. cars, chemical products). As expected, the application of BTAs to energy products is relatively straightforward. The GATT/WTO rules allow the same taxes to be imposed on imported like (energy) products, as well as the rebate of indirect taxes on exported domestic products – as long as there is no discrimination against foreign energy products. However, the situation becomes much more complicated when the products to be imported or exported are not the energy products themselves, but a product whose production or distribution involves the use of taxed energy inputs. It would appear that such BTA adjustments for imports on the basis of their PPMs is in direct conflict with the GATT/WTO principles (see, for example, Stewardson (1994); Zhang (1998); Brack et al. (1999)). Moreover, there would be formidable technical difficulties in identifying the appropriate energy/carbon contents embodied in traded products unless exporting countries that do not impose energy/carbon taxes are willing to cooperate in certifying how the products are produced.²⁸ In the absence of any information regarding the carbon content of the products from exporting countries, importing countries could, for instance, prescribe the tax rates based on their domestically predominant method of production for the imported products.²⁹

In addition to being methodologically challenging, there is the question of whether a tax levied on a product based on the carbon emitted in its production should be regarded as a direct tax or an indirect tax. This would further complicate applying BTAs to imports since GATT rules prescribe that the only BTAs eligible are those levied directly on products, such as excise or value added taxes. Taxes not directly levied on products are not eligible for adjustment, such as social security charges and payroll taxes. Given the fact that greenhouse gas emissions occurred during the manufacturing process are not really embodied in the product itself when it reaches the border, it is not at all obvious that such a tax would be considered as a direct tax (Cosbey and Cameron, 1999).

The potential effects on competitiveness can also be attenuated if the introduction of carbon taxes is announced in advance, phased-in gradually and increased over time. This will help to reduce economic effects of the tax by avoiding unduly early retirements of existing infrastructures and, at the same time, send a steady but strong price signal for a shift away from carbon-intensive choices. For example, the above ODC Tax in the United States was phased-in gradually over a period of years. For

²⁸ The use of a *de minimis* floor could substantially reduce the number of products that would be covered in the case of energy/carbon taxes, so that BTAs should be avoided where the tax is trivial percentage of the price. For example, in the case of the above Superfund Tax, BTAs are limited to primary products for which the share of taxable chemicals in production is at least 50 per cent, while in the case of the ODC Tax a *de minimis* rule is applied to non-listed products (Hoerner, 1998). However, the desirability of the use of a *de minimis* floor to lower substantial administrative burden must be weighted against the environmental effectiveness of energy/carbon taxes.

²⁹ This practice is by no means without foundation. For example, the United States Secretary of the Treasury has adopted the approach in the tax on imported toxic chemicals under the Superfund Tax (Poterba and Rotemberg, 1995; Hoerner, 1998). Nevertheless, such a practice seems very hard to justify in the case of energy/carbon taxes, given the wide range of technologies in use around the world and very different energy resource endowments and consumption patterns among countries.

most important ODCs, the tax is currently more than five times higher than its initial level (Hoerner, 1998).

Of course, another means of mitigating competitiveness effects would be through the international harmonization of energy/carbon taxes. Up to now, our discussion has been restricted to domestic carbon tax. However, even if domestic emission reduction targets are achieved in cost-efficient ways, for example, through a domestic carbon tax, a global cost-efficient emission reduction target can only be achieved if CO₂ emissions are distributed among countries in such a way that the marginal cost of abatement is equalized among countries. If an international carbon tax could be put in place to achieve this global cost efficiency, it will help avoid applying complex board tax adjustments among the countries where the common tax is imposed. However, the international harmonization of energy/carbon taxes is faced with some fundamental problems. For instance, the above mentioned CEC proposal for harmonization at the European Union level failed to gain the unanimous support of its member states, mainly because some member states (e.g. the United Kingdom) opposed an increase in the fiscal competence of the European Community and thus opposed the introduction at a European Union level of a new tax on the ground of fiscal sovereignty (Delbeke, 1997; Bill, 1999). Even if it had been agreed at the European Union level, competitiveness concerns from the outside of the European Union suggest that similar actions, especially in the United States and Japan, would have been undertaken. However, given the political difficulties in introducing carbon taxes in countries such as the United States, the prospects for the harmonization of carbon taxes at the OECD level seem remote, let alone across a wider group of countries. Moreover, the initial difference in energy prices further complicates the harmonization of carbon tax (Zhang, 1997; Eizenstat, 1998). Existing initial distortions in price regulations, taxation, national monopolies, barriers to trade and so on across countries have led to great differences in energy prices both between fuels and across countries, which in turn make tax harmonization virtually impossible (cf. Hoeller and Coppel, 1992). Thus, it is clear that while the harmonization of energy/carbon taxes at the OECD and global levels seems to be theoretically the ideal solution, its implementation with a view to minimizing competitiveness effects is not a plausible solution.

VII. CONCLUSION

The Kyoto Protocol marks an important first step towards internalizing the climate change externality and will potentially represent the most commendable effort by the international community to put the concept of sustainable development into practice. Measures taken by Annex 1 countries to meet greenhouse gas emissions targets will certainly have a bearing on world trade. They will affect the costs of production of traded products and therefore their competitive positions in the world market. Such an interface between trade policy and climate policy calls for policy co-ordination in a sufficiently coherent way.

Given the complexity in policy solutions required to tackle the global climate change problem, their clear trade and investment implications and the fact that amending WTO rules seems unlikely, it is important to consider ways to advance the Climate Change Convention and Kyoto Protocol objectives without compromising development aspirations through trade promotion. In this sense, this paper argues that there might be a need to revisit and eventually strengthen languages in Article 3.5 of the Climate Change Convention and Article 2.3 of the Kyoto Protocol in follow-up legal instruments

with a view to enhancing coherence between trade, climate change and development policies. In so doing, it seems imperative that governments and policy-makers have a better understanding of the potential conflict between the existing WTO trade regime and the emerging climate regime.

In dealing with transboundary and global environmental problems such as climate change, policies and measures adopted through multilateral negotiation processes have better chances to be WTO-consistent and thus avoid unnecessary conflicts and trade disputes, although the question remains on how the WTO could apply its rules with respect to a specific trade-related measure in a multilateral environmental agreement (MEA) when one WTO member country is not a party to such MEA but is affected by these measures. Indeed, the GATT and WTO panels have repeatedly made reference to multilateral solutions to environmental problems, while the WTO Committee on Trade and Environment has reiterated over the years its endorsement to multilateral solutions based on international co-operation and consensus as the best and most effective way to tackle environmental problems of a transboundary or global nature.

More recently, paragraph 31(i) of the Doha Declaration calls for negotiations on "the relationship between existing WTO rules and specific trade obligations set out in MEAs. The negotiations shall be limited in scope to the applicability of such existing WTO rules as among parties to the MEA in question. The negotiations shall not prejudice the WTO rights of any Member that is not a party to the MEA in question". It remains to be seen how this new mandate to CTE will evolve.

Experience with existing MEAs³⁰ shows that trade measures agreed upon within the MEA itself may not necessarily lead to a trade dispute between WTO members. On the contrary, there is a much greater chance of disputes arising from unilateral domestic measures introduced to fulfil MEA obligations³¹. This possibility of conflict may well arise in implementing the Kyoto Protocol. As discussed in the paper, policy responses to meet the Kyoto emissions targets will require a fundamental change in the way that energy is produced and the way it is used, and thus will essentially centre on greenhouse gas levels emitted by energy-using PPMs. This raises concern about trade implications of the whole PPMs controversy. Moreover, it is highly likely that Annex 1 governments with differentiated legal and political systems might pursue these policies in such a way as to unfairly favour domestic producers over foreign ones. Consequently, these domestic climate policies might have the potential to bring countries into conflict with their WTO obligations. In many cases, however, such conflicts are not so intractable as to threaten the integrity of either the Kyoto Protocol or the WTO rules. Provided that WTO rules are carefully scrutinized at the time Annex 1 governments take measures to achieve the required reductions in emissions, these conflicts can be avoided or at least minimized.

One strategy of avoiding the potential for conflict between the climate regime and the WTO rules is to pursue multilaterally agreed, WTO-consistent measures. Given that the TBT Agreement text gives a regulation that had been adopted and is pursuant to international standards a "presumption of consistency" with its disciplines, it seems logical to conclude that measures taken pursuant to recommendations or mandates of the Climate Change Convention would certainly be more acceptable than measures taken unilaterally. This can be translated into a strong plea for multilateralism, which is a fundamental principle

³⁰ Such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and the Montreal Protocol on Substances that Deplete the Ozone Layer.

³¹ The CITES, for example, explicitly allows its Parties to take stricter measures at the national level than those trade measures multilaterally agreed to between CITES Parties.

in the world trade regime. In this regard, although the prospects for the harmonization of performance standards and carbon taxes among Annex 1 countries seem remote, there is a much stronger case for attempting to harmonize procedural standards and procedures of establishing eco-labels. This would lower the costs of information on, and adjustments to, different requirements involved in exporting to different markets, thus promoting international trade.

The establishment of a joint WTO/UNFCCC working group – specifically one focusing on greater coherence between trade, climate change and development policy – could be an important step to help maximize synergies, while minimizing the potential for conflict.³² This working group would address, for example, specific issues such as an acceptable border tax adjustment mechanism for Kyoto-related carbon taxes or a non-binding Understanding on the interpretation of GATT Article 8.2(c) in its present or future form, among others. Unlike the Uruguay Round group with a mandate to examine the functioning of the GATT system, this joint working group could focus on discussions on the technical aspects and trade implications of specific measures and flexibility mechanisms envisioned in the implementation phase of the Kyoto Protocol. This would bring the consideration of specific climate policies and their resulting trade effects to a multilateral level and, at the same time, ensure their close consistency with the WTO rules, thus maximizing the WTO's contributions to sustainable development.

³² In this regard, it is worth noting that similar successful joint working groups have been established in the past, for example, between the UNFCCC and the Intergovernmental Panel on Climate Change (IPCC). Such working groups have been given a clear mandate within a given time (see Assunção, 2000).

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