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Scoping Paper on Climate Change Mitigation Policies and Measures in Select OECD Countries: Trade and Development Implications in Developing Countries

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1. Introduction

Most OECD countries are parties to international instruments on climate change, in particular the United Nations Framework Convention on Climate Change (UNFCCC) adopted in 1992, and the Kyoto Protocol to the UNFCCC adopted in 1997.¹

As signatories of the UNFCCC and the Kyoto Protocol, industrialized countries and economies in transition (cumulatively referred to as Annex I countries) have agreed to undertake mandatory and measurable carbon emissions reduction obligations. In fulfillment of these obligations, several OECD countries have enacted policies and legislation to address climate change, through national mitigation actions. Increasingly, policies in OECD countries have considered trade-related instruments, such as tariffs, standards, subsidies, as well as trade sanctions, in order to not only achieve their national climate policy objectives, but also to respond to perceived concerns about carbon leakage and competitiveness.²

These policies have increasingly obvious ramifications on trade competitiveness and sustainable development in developing countries. However, many developing country trade policy-makers and negotiators remain at the fringe of the climate change debate. This scoping paper seeks to provide trade negotiators and policy makers with an overview of domestic climate change measures being implemented or considered in OECD countries that may have trade and development implications for developing countries. The paper focuses on a group of select OECD countries including the United States, the European Union, Japan, Australia and Canada.

The paper examines national climate change mitigation policies, as formulated by governments in those OECD countries. In addition, it explores certain measures initiated by non-state actors, such as private companies in their supply chains, to the extent that they may have trade and development implications in developing countries.

¹ United Nations. 1998. *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. New York: United Nations.

United Nations. 1992. *United Nations Framework Convention on Climate Change*. New York: United Nations. The Kyoto Protocol entered into force in 2005 and established emission reduction targets for Annex I Parties which were intended to reduce their overall emissions of six greenhouse gases by an average of 5.2 per cent below 1990 levels from 2008 to 2012.

² The IPCC defines carbon leakage as the marginal emissions change in non-Annex I countries as a result of climate change policies in Annex I countries. Carbon leakage can occur in two ways – first from Annex I to non-Annex I countries as well as within Annex I countries themselves. Leakage to non-Annex I countries occurs when climate mitigation action in these countries lead to emissions moving into non-annex I countries, as a result of the absence of similar carbon reduction measures in the non-Annex I countries. Leakage within Annex I countries occurs when certain countries are given emissions reduction targets that are higher than their expected emissions. This leaves them room to grow their emissions, without violating their obligations under the Kyoto Protocol, a phenomenon known as “hot air”. This has been the case for Russia and certain former Soviet Union countries that experienced lower emissions levels after the fall of the Soviet Union.

The first part of the paper reviews key trade-related aspects of climate change policies in select OECD countries. The second part of the paper examines some salient trade and development implications for developing countries. The paper does not go into the subject of legal compatibility with WTO rules, nor does it address the issue of trade-remedies that measures adopted in OECD countries may trigger.³

2. An overview of national climate change policies of select OECD countries

The bulk of greenhouse gas emissions in industrialized countries originates from their energy, industrial and transport sectors.⁴ As a consequence, climate change policies and measures taken in OECD countries broadly consisted of three categories of measures targeting those sectors: regulatory measures (e.g. energy efficiency standards, mandatory targets for renewable energy), fiscal measures (e.g. domestic carbon and energy taxation, carbon/energy tax on imports or exports, and subsidies and domestic support mechanisms to producers and consumers) and finally market-based and incentive measures (e.g. Kyoto Protocol flexibility mechanisms – emissions trading, Joint Implementation, and Clean Development Mechanism), as well as market access for low carbon goods and services, and government procurement. In addition to these, certain OECD countries have included in their climate change programme measures on the development and transfer of technology as well as funding for adaptation in developing countries.

This set of policies may have a number of implications for developing countries in their access to markets in industrialized countries, their international competitiveness and overall development aspirations. At the juncture of OECD policies and their potential implications for developing countries are a set of international rules and principles that may come into play. These include, but are not limited to; WTO rules on subsidies, technical requirements, market access, border measures, rules concerning trade in services and investment, government procurement and taxes (see Annex 1).

There also are a set of key principles that guide the climate change negotiations, which deserve consideration. These include the following: the recognition that economic and social development and poverty eradication are global priorities; that the largest share of historical emissions of greenhouse gases has originated in developed countries; that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions; and that measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.⁵

³ For a recent review of legal trade questions arising in the context of the implementation of climate change policies, see Gary Clyde Hufbauer, Steve Charnovitz, and Jisun Kim (2009). *Global Warming and the World Trading System*. Petersen Institute for International Economics. Washington DC.

⁴ Comparatively, most emissions in developing countries come from agriculture and forestry, but increasingly from construction and residential sectors as well as from industry.

⁵ Derived from the UNFCCC, the Kyoto Protocol and the Bali Action Plan.

2.1 United States climate change policies with trade and development implications

The US is a signatory of the UNFCCC and the Kyoto Protocol, although it did not ratify the latter. US Federal climate policy consists of a wide array of initiatives to reduce U.S. greenhouse gas emissions and greenhouse gas emissions intensity. Since 2003, several climate change bills have been introduced in the US Senate and House of Representatives such as the Boxer-Lieberman-Warner Climate Security Act (S. 3036) and the Waxman-Markey American Clean Energy and Security Act (draft text). The newly elected Obama administration has made climate change a key priority area. States and cities within the US, most prominently the State of California, have been very proactive in adopting and implementing climate change regulations, including cap-and-trade programmes.

US climate change programs focus on energy efficiency, renewable energy, methane and other non-carbon dioxide (non-CO₂) gases, agricultural practices and implementation of technologies to achieve greenhouse gas reductions. Most proposed bills in the US include cost containment mechanisms and trade-related measures. Industry and unions concerned about loss of competitiveness have exerted political pressure to ensure that US targets will not hurt them and that legislation contains measures to “level the playing field” vis-à-vis competitors in other countries.

However, not all legislation is taking a “hard” line on the competitiveness debate. The American Clean Energy and Security Act of 2009, introduced by Democrats Henry Waxman and Edward Markey, would establish an aggressive cap-and-trade programme, as well as initiatives aimed at promoting renewable energy (25 percent renewable by 2025), energy efficiency, and updating standards for transportation emissions, and reducing global warming pollution. The draft sets both a non-binding economy-wide GHG emission reduction goal as well as a mandatory cap on certain greenhouse gases.

The bill proposes output-based rebating as primary mechanism for dealing with competitiveness/leakage concerns of carbon-intensive manufacturers. Sectors are presumed eligible if they meet 5 percent energy or GHG intensity threshold and 15 percent trade intensity. Each sector is rebated at 85 percent of sector average direct and indirect emissions cost. Rebates are phased out beginning in 2020, unless Presidential review determines that other countries have not yet taken substantial action and leakage concerns persist. By June 2017, US President will report on competitiveness implications of climate policy.⁶

2.2 EU climate change policies with trade and development implications

On 23 January 2008, the EU released a legislative draft spelling out the implementation of the EU climate strategy, to make a 20 percent cut in greenhouse gas emissions by 2020 as compared to 1990 levels and to derive 20 percent of its energy from renewable

⁶ For a discussion of the Waxman and Markey bill see, John Larsen, Alexia Kelly and Robert Heilmayr (2009). Brief Summary of the Waxman-Markey Discussion Draft. World Resources Institute, April 20. http://pdf.wri.org/wri_waxman_markey_draft_summary_20090331.pdf

sources.⁷ The European Emissions Trading Scheme (ETS), which is expected to serve as a key tool for achieving the target, was expanded to cover additional greenhouse gases beyond carbon dioxide, and additional sectors, such as oil refineries and airlines, chemical and aluminium production.

The energy-intensive steel, cement and aluminium industries will likely get their emissions permits for free after 2013, when the new, tighter ETS regime comes into place, in order to allay competitiveness concerns. Further, energy-intensive industries will only have to buy 70 percent, rather than 100 percent of their permits in 2020, and Eastern European power generators will get their permits at a special discount.⁸ Power utilities, which are to a great extent shielded from international competition due to their physical proximity to the consumers, will have to pay for all their permits starting in 2013. The package also contains provisions to support carbon capture and storage technologies, and new rules for state aid towards climate projects. The EU indicated, however, that in the event of failure in international negotiations on a global climate agreement, it may take trade measures to safeguard its energy-intensive industry.

2.3 Japan

Japan has set a long-term objective of reducing GHG emissions by 60 to 80 percent below its current level, by 2050. Improvements in energy efficiency have been an important part of the Japanese plan. The government seeks a 30 percent reduction in energy intensity from the 2003 baseline, by 2030. Like Canada, Japan seems unlikely to be able to meet its Kyoto Protocol target of reducing its emissions by 6 percent, from their 1990 level. Policy vis-à-vis industry is based on voluntary targets, rather than the imposition of a mandatory cap-and-trade scheme, although debate on the development of a Japanese emissions trading scheme has been going on for many years.

At the international level, Japan proposed in March 2008 a sectoral approach to global GHG emissions reduction, which would be applied on specific sectors for all major emitters. The Japanese proposal generated strong reactions from developing countries in particular, worried that the setting of international reduction targets of standards would imply mandatory emissions cut for them, in the same manner as would be required of developed countries. The Japanese proposal was eventually reconsidered to mean an additional approach to national mitigation targets of developed countries.

The heavy industry in Japan has sought exemptions from national emissions reduction targets, in order to ease competitiveness pressure.

⁷ ICTSD (2008) “EU climate strategy: Border measures remain and option. [Bridges Trade BioRes](#) • [Volume 8](#) • [Number 1](#) • 25th January 2008.

⁸ ICTSD (2008). “Europe spells out climate plan, takes global lead”. [Bridges Trade BioRes](#) • [Volume 8](#) • [Number 1](#) • 25th January 2008.

2.4 Canada

Canada was in 2004 the fifth largest contributor to GHG emissions among Annex I countries. Much of its emissions come from energy and natural resource extraction sectors that are highly energy-intensive. Canada's national climate change strategy includes the Regulatory Framework for Air Emissions from large final emitters, introduced in April 2007 with four main elements: (i) mandatory GHG and air pollution emission targets and compliance mechanisms applicable to large industrial emitters including the electricity, oil and gas, and mining sectors; (ii) measures targeted at emissions from the transportation sector including mandatory car and light truck fuel efficiency standards to apply in 2011; (iii) energy efficiency standards applicable to consumer and commercial products; and (iv) measures directed at improving indoor air quality.

The regulatory framework sets a goal of reducing absolute GHG emissions by 20 per cent below 2006 levels by 2020, and 60 to 70 per cent below 2006 levels by 2050. Companies will have an emissions-intensity reduction target based on an improvement of 18 per cent per unit of production over the next three years. In October 2007, the Government of Canada highlighted the importance of climate change, noting that a global solution to climate change is required. It indicated that Canada will not meet its Kyoto commitment within the compliance period, but will act "even more aggressively at home" while pursuing an international consensus.⁹

In the climate change negotiations, Canada has called for engagement of all major emitting countries and commitments by major developing countries to limit and then stabilize emissions growth. With respect to competitiveness concerns, Canada has pursued an approach of engaging all major GHG emitters in global mitigation efforts, emphasizing the point that sectoral approaches to mitigation can result in mitigation in major emitting developing countries and lessen competitiveness concerns in industrialized countries. Thus the use of unilateral trade measures to address competitiveness concerns has so far not formally been contemplated by the Canadian government.

2.5 Australia

After refusing to ratify the Kyoto Protocol, Australia reversed its stance at the UN Conference of the Parties in Bali, Indonesia, in December 2008. On 15 December 2008, Australia released its White Paper, Carbon Pollution Reduction Scheme: Australia's Low Pollution Future. The paper outlines the final design of the Carbon Pollution Reduction Scheme and decisions on other significant climate change programs. The Government reaffirmed its commitment to meeting a long-term target of a 60 per cent reduction in greenhouse gas emissions from 2000 levels by 2050, and a medium-term national target

⁹ John Drexhage, Deborah Murphy and Jenny Gleeson, ed. (2008). *A Way Forward: Canadian perspectives on post-2012 climate policy*. International Institute for Sustainable Development. Winnipeg, Canada.

to reduce greenhouse gas emissions by between 5 per cent and 15 per cent below 2000 levels by the end 2020.

In addition to the Carbon Pollution Reduction Scheme, other major elements of Australia's mitigation strategy are the expanded Renewable Energy Target investment in renewables and carbon capture and storage and action on energy efficiency.

A proposed cap and trade scheme would cover around 75 per cent of Australia's emissions and involve mandatory obligations for around 1000 entities. With respect to emissions-intensive, trade-exposed industries (EITE industries), assistance is provided in the form of an administrative allocation of permits, linked to the EITE industry's output. The criteria of trade exposure is defined by having a trade share (defined as the ratio of the value of imports and exports to the value of domestic production) of greater than 10 percent in any year between 2004-05 and 2007-08, or a demonstrated lack of capacity to pass through costs due to the potential for international competition. Emissions intensity will be measured on the basis of the emissions-to-revenue or emissions-to-value-added of activities being above nominated thresholds.

The Australian plan specifies that assistance should not breach Australia's international trade obligations as they relate to Australia's obligations as a member of the World Trade Organisation and a party to the Agreement on Subsidies and Countervailing Measures, and a number of bilateral free trade agreements.¹⁰

4. Trade and development implications in developing countries

The UN Framework Convention on Climate Change, in its article 3.5, recognizes that action to address climate change may have trade implications. Hence, in setting the guiding principles for the Convention, Parties cautioned 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”. Similarly, Annex I Parties to the Kyoto Protocol have agreed to “strive to implement policies and measures ... in such a way as to minimize adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties”.

Climate change negotiators have considered the potential effects of using trade tools to achieve climate change objectives and their related environmental, social and economic consequences, including spillover effects, particularly for developing countries. The *Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol to the UNFCCC (AWG-KP) has recognised such concerns and agreed that any

¹⁰ Government of Australia, Department of Climate Change. Carbon Pollution Reduction Scheme: Australia's Low Pollution Future - White Paper, 15 December 2008. <http://www.climatechange.gov.au/whitepaper/summary/index.html>

future work on the assessment of, and possible action to address, such consequences, in particular in developing countries, should focus on the causes and effects.¹¹

The following sections review and discuss some of the most prominent issues that have emerged in this context of this debate on potential trade and development implications for developing countries, of measures taken to address climate change in developing countries. It should be noted that while there has been much concern about the potential negative consequences, policies adopted in OECD countries can also offer new trade and development opportunities for developing countries. These may arise where developing countries are able to contribute to achieving mitigation objectives set in developed countries, typically by providing the space for such mitigation action (as in the case of the Clean Development Mechanism), or by supplying goods and services with climate mitigation potential.

4.1. Border carbon measures, trade and competitiveness

Countries set to take on mandatory climate mitigation obligations worry that this may affect the international competitiveness of their energy- and carbon-intensive industries. Concerns centre on the economic and social implications of the real or perceived costs of relocating industries to countries without such obligations. In addition, such relocation may lead to higher overall carbon emissions from the same volume of production of goods in countries with less efficient processes.

In response to such concerns, politicians have been considering legislation instituting carbon-related “competitiveness provisions” in the form of mandatory carbon offsetting allowances on imports, or border tax adjustments. Draft legislation in the US contains provisions for carbon barriers targeting emerging economies amongst non-Annex I countries currently not obliged to make emissions reductions. In Europe, border measures were left out of draft climate and energy legislation – at least for the moment – however, they are very much part of the debate, and the European Parliament has been calling for border measures against climate “free riders”.

Carbon related border measures are controversial. Their legality under the WTO has also been questioned. Recent studies have pointed to the potential ineffectiveness of unilateral trade measures to encourage action on climate change (Houser *et al* 2008).

Countries such as China and India have been at the centre of most of the debate on border measures. China recently surpassed the US as the world’s top emitter of greenhouse gases, prompting calls for more active engagement in global mitigation efforts.

¹¹ See for example, Report of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol on its resumed sixth session, held in Poznan from 1 to 10 December 2008 accessible at: <http://unfccc.int/resource/docs/2008/awg6/eng/08.pdf>, and more specifically, Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol, Sixth session Accra, 21–27 August 2008, and Poznan, 1–10 December 2008 Agenda item 5, Consideration of information on potential environmental, economic and social consequences, including spillover effects, of tools, policies, measures and methodologies available to Annex I Parties, Draft conclusions proposed by the Chair, accessible at: <http://unfccc.int/resource/docs/2008/awg6/eng/117.pdf>

Following the release of the American Clean Energy and Security Act of 2009, some US manufacturers have expressed concern that the bill might impact their business. The US steel industry stated that government should carefully consider the impact of a possible flood of cheap foreign imports and suggests a carbon fee be placed on steel from any country that does not regulate greenhouse gas emissions. The proposed bill acknowledges the obstacles that the steel, aluminium, cement and chemicals industries will face under cap-and-trade. To that end, the draft legislation would offer assistance in the form of rebates, incentives for carbon capture projects, and a special reserve of allowances. Under the rebate programme, the government would distribute payments to manufacturing industries adversely affected by foreign competitors located in countries that do not have similar emissions-reduction requirements. But if such measures prove inadequate, the bill would allow the president to establish a so-called ‘border adjustment programme’, which would require importers of emissions-heavy goods from countries that do not regulate carbon emissions to purchase special allowances from the government.

Given the persistent rhetoric on use of carbon taxes, studies have started to contemplate the potential implications of the imposition of carbon taxes on developing countries’ exports of energy-intensive products in developed country markets.¹² In the case of China, based on various scenarios, it is estimated that the implementation of border carbon taxes in the EU or US would have serious negative impacts on eight energy intensive sectors in China. Cost increase in some sectors (Ferrous Metals, Nonmetal mineral products, Chemical material and Products) would be about 15 percent. The overall loss in profitability would be more than 10 percent.¹³

In reality, on both sides of the Atlantic, recent policy debates have tended to temper the arguments about border taxes on imports from countries that may not take so-called “comparable action” in climate mitigation. In Europe, lack of compelling evidence about leakage, has brought politicians to “ease the tension” on the issue of border carbon measures. Policy makers have realized that despite several studies on potential carbon leakage, there is so far no tested evidence of leakage from the EU ETS so far.¹⁴

A similar dynamics is being observed in the US. On 14 April 2009, US Trade Representative Ron Kirk addressed a letter to Republican representatives Joe Barton, Ralph Hall, Greg Walden, and Paul Brown, downplaying the notion that the Obama Administration would implement a border tax on imports from large developing countries to help domestic industry under a cap-and-trade scheme. The letter came in response to questioning from Republican Congressman Joe Barton regarding comments made by Energy Secretary Stephen Chu at a hearing in the House of Representatives in early March. Chu had suggested that in order to prevent ‘leakage’ and protect local industry

¹² Smelting and Pressing of Ferrous Metals, Nonmetal mineral products, Chemical material and Products, Non-Ferrous Metals, Mining of Nonmetal minerals, Metal products, Chemical Fiber, Paper and pulp.

¹³ Pan Jiahua and Xie Laihui (2009 forthcoming) Legal and economic analysis of proposed border tax adjustments (BTAs) with relation to climate change: A Chinese perspective.

¹⁴ See among other studies, J. Reinaud, Issues behind competitiveness and carbon leakage; D. Ellermann et al. Competitiveness and carbon leakage: Implications for China and the World (forthcoming).

under an emissions cap-and-trade programme, the US would not rule out using tariffs and other trade barriers to pressure countries like China and India to cut back on emissions.¹⁵ Kirk's letter reads - "our consideration of the necessity of, and options for, addressing carbon leakage will include how potential measures might be targeted towards the circumstances of energy and trade intensive industries," the letter reads. "The administration, however, does not support any specific measures, including border measures, at this time." It further mentions that "the Administration believes that the best approach to address concerns with carbon leakage is to negotiate a new international climate change agreement in the United Nations that ensures that all the major emitters take long term, significant action to reduce their greenhouse gas emissions".¹⁶

4.2. Renewable energy

Policy targets for renewable energy exist in at least 66 countries worldwide, including all 27 European Union countries, 29 U.S. states (and D.C.), and 9 Canadian provinces. Most targets are for shares of electricity production, primary energy, and/or final energy by a future year. The development of the renewable energy sector is backed by supporting policies in most OECD countries. The most common policy is the feed-in law. By 2007, at least 37 countries and 9 states/provinces had adopted feed-in policies. There are many other forms of policy support for renewable power generation, including capital investment subsidies or rebates, tax incentives and credits, sales tax and value-added tax exemptions, energy production payments or tax credits, net metering, public investment or financing, and public competitive bidding. About half of all U.S. states have capital subsidy programs (or tax-credit policies), either statewide or for specific utilities to promote grid-tied rooftop solar PV. Both the US and Sweden provide a 30 percent national tax credit for solar PV (although the U.S. policy was set to expire in 2008). France provides a 50 percent income tax credit. Australia provides rebates up to AUD \$8/watt (\$7/watt). The United Kingdom restarted a grants program in 2007 that subsidizes household solar PV, micro-scale wind, and solar hot water. In Japan, over 300 municipalities continue to provide subsidies for solar PV after the expiration of Japan's national subsidy in 2005.¹⁷

Biofuels are an important part of the energy renewable package in most OECD countries. In the US, the Energy Independence and Security Act of 2007 mandates the country to use 15 billion gallons of corn ethanol and 1 billion gallons of biodiesel per year by 2015. It also requires the US to use 16 billion gallons of ethanol derived from non-food crops such as switchgrass and woodchips annually by 2022. The EU had set a target of 10 percent of biofuels in the share of transport fuel by 2020, a figure that has been a matter of controversy – now under review. Japan's new strategy for long-term ethanol production targets 6 billion liters/year by 2030, representing 5 percent of transport energy.

¹⁵ [Bridges Weekly Trade News Digest](#) • Volume 13 • Number 14 • 22nd April 2009

“Obama Administration Not Ready to Support Carbon Border Tax: Kirk”

¹⁶ Ron Kirk's 14 April letter to Joe Barton can be accessed here: <http://ictsd.net/downloads/2009/04/kirk-letter-14-04-09.pdf>

¹⁷ REN21 Renewable Energy Policy Network for the 21st Century (2007). Renewables 2007 Global Status Report. http://www.ren21.net/pdf/RE2007_Global_Status_Report.pdf

These ambitious targets on renewable energy, especially for biofuels, that have been set in OECD countries can hardly be met by local production. They have in most cases been designed with a view to partly rely on imports. Efficient developing country producers such as Brazil, in the case of ethanol, may therefore have an opportunity to supply part of the biofuels needed to meet targets set in the US, the EU and other OECD countries.

This potential, is however being constrained by certain policies supporting domestic producers in OECD countries through subsidies and taxation, together with tariff barriers that make it more difficult for foreign producers to enter the market.

The OECD estimates that in 2006 the combined support provided by governments in the EU, the US and Canada for biofuel production and use totalled \$US11billion. This support is projected to increase to \$US25 billion in 2013-17.¹⁸ In a sector that is developing fast, with rapidly emerging developing country players, subsidies and support programs in OECD countries can potentially make it harder for developing country producers to effectively penetrate and compete in the industry.

In addition to domestic support programmes, many OECD countries apply tariffs on biofuel imports that prevent the full potential of certain developing country exporters. For example, the US levies 54 cents per gallon on ethanol imports. In the EU tariff duties are relatively low for biodiesel (6.5 percent), whereas tariffs on ethanol are to an AVE of 40-100 percent depending on the price of ethanol - the lower the price of ethanol, the higher the ad valorem equivalent.¹⁹

Finally, proposed biofuels criteria, which are supposed to ensure that biofuels meet certain environmental and social objectives, are being considered unfair non-tariff barriers hampering developing country exports. In the EU, biofuels would have to give a real saving in carbon dioxide emissions of 35 percent compared to oil. Feedstock crops cannot be grown on land with high biodiversity values, nor land containing high carbon stocks. In addition, growing biofuels feedstock would have to fulfil best agricultural practices criteria. The restrictions would apply both to home-grown and imported biofuels.

Absent these constraints, a number of developing countries could make a positive contribution to developed countries set targets on renewable energy including biofuels. Brazil, which accounts for 50 percent of US imports, could expand its trade. But other countries also stand to benefit. For example, studies on African bioenergy trade potential (Johnson et al. 2006)²⁰ have shown that the Southern African Development Community (SADC) which produced 939 million litres of bio-ethanol from sugarcane and sweet sorghum in 2005, could in 2020 reach 23650 million litres of ethanol production. Given

¹⁸ OECD (2008) Biofuel Support Policies: An Economic Assessment.

¹⁹ Jönsson, M. (2007). Trade aspects of the biofuels sector. Swedish National Board of Trade. Report No 119-0109-2007.

²⁰ Francis Johnson, V. Seebaluck, H. Watson and J. Woods, Cane Resources Network for Southern Africa (2006). In ICTSD (2006), *Linking Trade, Climate Change and Energy*, ICTSD Trade and Sustainable Energy Series, International Centre for Trade and Sustainable Development, Geneva, Switzerland.

that the projected SADC petrol demand (energy basis) for 2020 would be 6155 million litres, the region would be left with 17495 million litres of ethanol for export, with an average annual increase of 20 percent. Such a production and export potential taking into account sustainability concerns could provide an important contribution to the region's development and poverty reduction efforts.

4.3. Climate-related standards and labels

The role of carbon standards and labelling schemes is likely to grow in the future, driving improvements in the efficiency of products and production processes, while providing consumers with the option of decreasing their personal carbon footprints. These schemes provide positive product differentiation and market opportunities.

However, from a trade policy perspective, standards and labels can in certain cases represent non-tariff barriers to trade. The WTO, in particular the agreement on technical barriers to trade, establishes a number of conditions that will be relevant in the development and implementation of initiatives in this area.

Energy efficiency standards

Improvements in energy efficiency can provide a significant potential for reducing greenhouse gas emissions in the energy sector (up to 78 percent of the emissions reduction savings potential by 2030), making it a critical climate mitigating instrument. As such, most OECD countries have included in their climate programmes energy efficiency standards, in the form of mandatory minimum energy performance standards (MEPS) with the aim to raise the efficiency level of new products entering the market. In addition, energy-information labels are required by all OECD and EU Member countries. Increasingly, governments are taking a step further by phasing out older technologies and products that use more energy and produce more greenhouse gas emissions. For example, on 18 March 2009, the European Commission adopted two ecodesign regulations to improve the energy efficiency of household lamps and of office, street and industrial lighting products. Inefficient lamps - incandescent bulbs and conventional halogen bulbs - will be phased out gradually from the European Union market between September 2009 and September 2012 and will be replaced by more efficient lighting.²¹ In 2007, Australia became the first country to enact an outright ban on incandescent lights, which will take effect in 2010.

Generally, product efficiency standards apply both to domestic and foreign producers, and as such would not pose, *a priori*, problems of legal compatibility. There is less clarity as to process related standards.

For developing countries, practical trade and development challenges relate to cost and the capacity to comply with increasingly diverse and fast evolving standards setting

²¹ European Commission, Commission Regulation (EC) No 244/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:076:0003:0016:EN:PDF>

processes. This may affect their ability to enter into, or maintain market share in certain industry segments. According to a survey conducted in 2007 by the General Administration of Quality Supervision, Inspection and Quarantine of China, more than 31.4 percent of China's exports were more or less affected by the technical trade measures of the importing countries in 2006, resulting in USD35.92 billion of direct trade loss and USD19.155 billion of increment in compliance costs. Among the various categories of products most affected by overseas technical trade measures, electrical and electronic equipment ranked first. The survey also shows that energy efficiency and product recycling requirements is one of the various types of technical trade measures that posed the highest market access barriers for China's exports in 2006.²²

Carbon standards in agriculture: Food miles

The world trade in fresh fruits, fruit products, vegetables and vegetable products more than doubled over the two decades between 1982-1984 and 2002-2004. Developing countries export a third of the total trade. In this context, carbon labelling schemes have emerged as part of an effort to measure, and communicate the carbon footprint of agricultural products trade internationally. They are primarily meant to provide consumers with the option of decreasing their personal carbon footprints. The first experiment with carbon labelling have been in the form of airplane stickers in supermarkets to indicate fresh produce that had been air-freighted, from producing countries, into markets of consuming countries. These labeling schemes are by nature voluntary and originate in private initiatives by supermarkets and their supply chains in certain OECD countries. They have generally missed the point of full cycle carbon accounting, and ended up hurting some of the poorest and most vulnerable countries that had found a niche market in air-freighting off-season fresh produce such as fruits, vegetable and flowers in OECD markets.

The WTO notes, in its website that “some studies conducted on the “carbon mileage” of traded goods have shown that the effect can be the opposite of what is commonly believed. For instance, it has been argued that Kenyan flowers air-freighted to Europe would generate less CO₂ emissions than flowers grown in the Netherlands; or New Zealand lamb transported to the United Kingdom would generate 70 per cent less CO₂ than lamb produced in the United Kingdom. Therefore, food miles may be an issue in need of case-by-case analysis, and empirical verification”.²³

Incidentally, legal experts are of the view that any food miles charges would be a violation of the GATT Article I (General Most Favored Nation Treatment), because it would be origin-specific.²⁴

²² ICTSD (2008). *Trade, Climate Change and Global Competitiveness: Opportunities and Challenges for Sustainable Development in China and Beyond: Selected Issue Briefs No. 3*. ICTSD Trade and Sustainable Energy Series. International Centre for Trade and Sustainable Development, Geneva, Switzerland. http://ictsd.net/downloads/2008/08/china-web_final.pdf

²³ WTO (undated). The multilateral trading system and climate change. http://www.wto.org/english/tratop_e/envir_e/climate_change_e.pdf

²⁴ Gary Clyde Hufbauer, Steve Charnovitz, and Jisun Kim (2009). *Global Warming and the World Trading System*. Petersen Institute for International Economics. Washington DC.

Much of the problem with such labeling schemes relates to the fact that they are enacted unilaterally, without participation of those likely to be affected. Since the role of voluntary carbon labeling schemes is likely to grow in the future, the debate on carbon footprints needs to be expanded to involve all relevant players. In addition, carbon schemes would need to balance the need for accurate and useful data (using life-cycle analysis, and evaluate how to reduce emissions at each stage of the chain to achieve low carbon ratings) with the need to be simple, transparent and involve sufficiently low transaction costs.

On the other hand, there are certain areas in which developing countries may derive new trade opportunities, making use of product differentiation schemes. Sustainable forms of agriculture, such as organic farming, which contribute to GHG emissions reductions, are one such area.²⁵

Some developing countries have emerged as important players in organic farming, and are large exporters of such products. Globally, there has been an increase for organic products with sales increasing by over US\$5 billion a year. Organic Monitor estimates international sales to have reached US\$46.1 billion in 2007. Organic agriculture may offer a real trade and poverty reduction opportunity for developing countries as 97 percent of the revenues are generated in Europe and North America whereas more than 80 percent of the producers are in Africa, Asia and Latin America. The countries with the most producers are Uganda, followed by India, Ethiopia and Mexico.

By effectively branding these products on the basis of their climate change benefits, developing countries could expand the trade and development opportunities, while contributing to climate mitigation efforts in the agricultural sector.

4.4. Flexibility mechanisms under the Kyoto Protocol

Developed countries with commitments under the Kyoto Protocol to limit or reduce GHG have access to additional means of meeting their assigned reduction targets, through three market-based mechanisms, created under the Kyoto Protocol (so-called Kyoto flexibility mechanisms): Emissions Trading, The Clean Development Mechanism (CDM) and Joint Implementation (JI). Of these three mechanisms, only the CDM provides an opportunity for carbon market in the developing countries.

The CDM allows developed countries to invest in emission-reduction projects in developing countries. Such projects generate certified emission reduction (CER) credits, each equivalent to one tonne of CO₂, which can be counted towards meeting Kyoto targets. The CDM is the first global, environmental investment and credit scheme of its kind, providing a standardized emissions offset instrument, CERs. Many developed countries have initiated CDM projects in developing countries, covering a wide range of sectors such as renewable energy industries, manufacturing industries, chemical industries, agriculture, afforestation and reforestation, transport, among other sectors.

²⁵ An FAO study (Scialabba and Hattam (2002)) concluded that “CO₂ emissions per hectare of organic agriculture systems are 48 percent to 68 percent lower than in conventional systems”.

There currently are 4200 CDM projects in pipeline, of which 1597 are registered, and 76 are requesting registration.

CDM projects are expected to enhance sustainable development in host countries, contribute to the transfer of technology, and thereby may enhance export competitiveness in the sectors concerned. The geographical distribution of CDM projects within the host countries has so far been imbalanced. Owing to their potential to attract projects with a vast GHG mitigation potential, large developing countries, such as China, India and Brazil, have received the bulk of CDM projects.

A recent survey commissioned by the UNFCCC secretariat reviewed the project design document (PDD) of 3,296 projects in the CDM pipeline (registered and proposed) as of June 2008, located in 67 host countries. It found that 36 percent of the projects claim transfer of technology. It also indicates that transfer of technology is more common for larger projects (representing 59 percent estimated emission reductions).

The survey reveals that while the following OECD countries (Japan, Germany, the USA, France, and Great Britain) are the main origin of transfer of equipment and knowledge (70 percent), developing countries Brazil, China, India, South Korea and Chinese Taipei are the source of 94% of equipment transfers and 70% of knowledge transfers from Non-Annex 1 sources. Hence, in the global supply chains of material and knowledge, there is indication that developing countries are being part of the CDM process not only as host countries but also as providers of goods and services.²⁶

²⁶ The UNFCCC survey “Analysis of Technology Transfer in CDM Projects” can be accessed at: <http://cdm.unfccc.int/Reference/Reports/TTreport/TTrep08.pdf>

Annexes

Annex 1: Examples of climate change measures and related trade-implications

Climate change measure	GATT-WTO Related Agreement
Examples of regulatory measures	Trade-related issues/implications
<p><i>Energy efficiency standards</i></p> <ul style="list-style-type: none"> • These have been introduced in most OECD (Organisation for Economic Co-operation and Development) countries, but also in certain developing countries. • 57 countries with 80 percent of the world's population now have energy efficiency standards and labelling programmes. 	<ul style="list-style-type: none"> • WTO's Technical Barriers to Trade agreement prohibits standards that create unnecessary obstacles to trade, and favours international standards over national ones. • It is unclear whether standards can be set on production and process methods (PPMs) that do not affect the end characteristics of final products.
<p><i>Regulations, standards and targets for renewable energy</i></p> <ul style="list-style-type: none"> • EU: 20 percent of energy from renewables by 2020. • US: 35 billion gallons of renewable and alternative fuels in 2017. • China: 15 percent from renewables by 2020. 	<ul style="list-style-type: none"> • In many jurisdictions, renewable energy targets have been made a requirement for energy producers and electricity generators under feed-in-laws and renewable obligations. These policies involve producer subsidies that may raise trade concerns.
Examples of fiscal measures	Trade-related issues/implications
<p><i>Domestic carbon and energy taxation</i></p> <ul style="list-style-type: none"> • Energy taxes common in most countries. • Carbon taxes proposed in many countries but actually implemented in a few. 	<ul style="list-style-type: none"> • Domestic carbon and energy taxes do not raise trade concerns as long as national treatment and non-discrimination principles apply.
<p><i>Carbon/energy tax on imports or exports</i></p> <ul style="list-style-type: none"> • Border tax adjustment on imports/exports proposed in some countries but not yet implemented in any. 	<ul style="list-style-type: none"> • Under GATT rules border tax adjustments are possible for direct taxes. • It is unclear whether adjustment can be made for indirect taxes on unincorporated input during the production of goods.
<p><i>Subsidies and domestic support mechanisms</i></p> <ul style="list-style-type: none"> • Subsidies to fossil fuels and renewables common in many developed and developing countries 	<ul style="list-style-type: none"> • The SCM (subsidies and countervailing measures) agreement prohibits industry and sector-specific subsidies.
Examples of market-based and incentive measures	Trade-related issues/implications
<p><i>Emissions trading (ET), joint Implementation (JI), Clean Development Mechanism (CDM).</i></p> <ul style="list-style-type: none"> • These have been implemented in developed (JI, ET) and developing countries (CDM, ET). 	<ul style="list-style-type: none"> • Can CDM projects be used as benchmarks for defining environmental goods? • It remains unclear under which conditions there may be a subsidy element in the allocation of emissions allowances in ETS (emissions trading system).
<p><i>Trade liberalisation in low-carbon goods and services</i></p> <ul style="list-style-type: none"> • Ongoing negotiations in the Doha Round – complexity and difficulty of defining environmental goods and services. 	<ul style="list-style-type: none"> • Liberalisation in climate-friendly goods and services has been considered in the negotiations on EGS (environmental goods and services).
<p><i>Government procurement</i></p> <ul style="list-style-type: none"> • Procurement policies in several countries. 	<ul style="list-style-type: none"> • Environmental factors can be taken into account in government procurement decision under the WTO Agreement on government procurement.

Annex 2. Cost increase in major Chinese energy intensive sectors under different EU BTAs scenarios

Sectors	Scenario 1 (%)	Scenario 2 (%)	Scenario 3 (%)
Ferrous Metals	5.26	10.52	15.79
Nonmetal mineral products	4.67	9.35	14.02
Chemical material and Products	3.91	7.82	11.74
Non-Ferrous Metals	2.87	5.73	8.60
Mining of Nonmetal minerals	2.86	5.72	8.57
Metal products	2.84	5.68	8.52
Chemical Fiber	2.60	5.20	7.80
Paper and pulp	2.55	5.09	7.64
Total	3.77	7.54	11.32

Source: Pan Jiahua and Xie Laihui (2009 forthcoming)

Note: the data in the last row for “total” is calculated with the total tax revenue and total trade value for these eight sectors, and it is intended to show the average tax burden for these sectors.

Annex 3. Cost increase in major Chinese energy intensive sectors under different US BTAs scenarios

Sectors	Scenario 1 (%)	Scenario 2 (%)	Scenario 3 (%)
Ferrous Metals	5.26	10.52	15.79
Nonmetal mineral products	4.67	9.35	14.02
Chemical material and Products	3.91	7.82	11.74
Non-Ferrous Metals	2.87	5.73	8.60
Mining of Nonmetal minerals	2.86	5.72	8.57
Metal products	2.84	5.68	8.52
Chemical Fiber	2.60	5.20	7.80
Paper and pulp	2.55	5.09	7.64
In Total	3.63	7.27	10.90

Source: Pan Jiahua and Xie Laihui (2009 forthcoming)

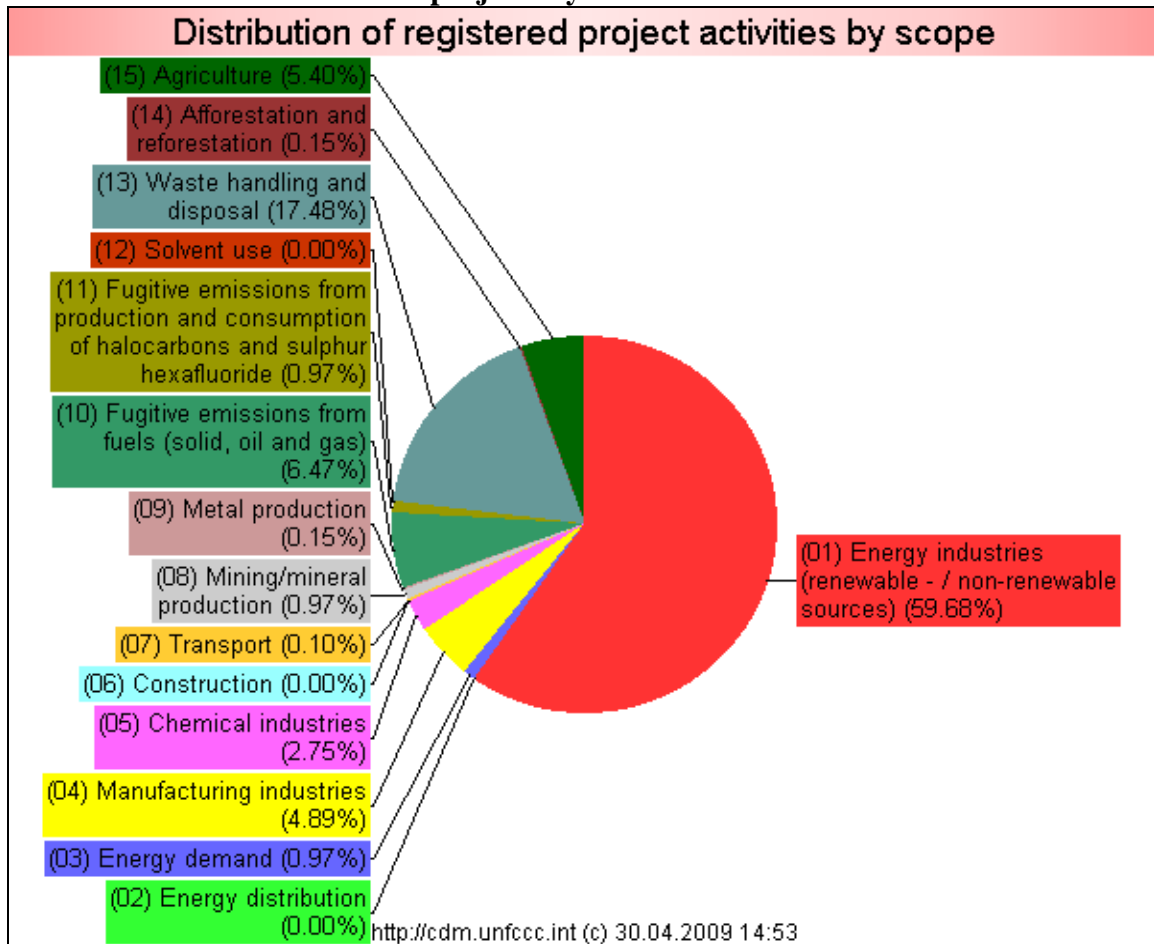
Note: 1) the data in the last row for “total” is calculated with the total tax revenue and total trade value for these eight sectors, and it is intended to show the average tax burden for these eight sectors. 2) The data here are basically the same with Table 5, this is because the same tax rate was assumed and the cost increases are irrelevant with the trade value.

Annex 4. Renewable Energy Promotion Policies

Country	Feed-in tariffs	Renewable portfolio standard	Capital subsidies, grants, or rebates	Investment or other tax credits	Sales tax, energy tax, excise tax, or VAT reduction	Tradable renewable energy certificates	Energy production payments or tax credits	Net metering	Public investment, loans, or financing	Public competitive bidding
Developed and transition countries										
Australia		✓	✓			✓			✓	
Austria	✓		✓	✓		✓			✓	
Belgium		✓	✓	✓		✓			✓	
Canada	(*)	(*)	✓	✓	✓	✓		(*)	✓	(*)
Croatia	✓		✓	✓					✓	
Cyprus	✓		✓							
Czech Republic	✓		✓	✓	✓	✓		✓		
Denmark	✓				✓	✓		✓	✓	✓
Estonia	✓				✓	✓				
Finland			✓		✓	✓	✓			
France	✓		✓	✓	✓	✓			✓	✓
Germany	✓		✓	✓	✓	✓			✓	✓
Greece	✓		✓	✓						
Hungary	✓		✓	✓	✓	✓			✓	
Ireland	✓		✓	✓		✓				✓
Italy	✓	✓	✓	✓		✓		✓		
Israel	✓									
Japan	(*)	✓	✓			✓		✓	✓	
Korea	✓		✓	✓	✓				✓	✓
Latvia	✓								✓	✓
Lithuania	✓		✓	✓					✓	
Luxembourg	✓		✓	✓						
Malta	✓				✓					
Netherlands	✓		✓	✓		✓	✓			
New Zealand			✓	✓					✓	
Norway			✓	✓		✓				
Poland		✓	✓	✓	✓	✓			✓	✓
Portugal	✓		✓	✓	✓					
Romania					✓					
Russia			✓			✓				
Slovak Republic	✓			✓					✓	
Slovenia	✓								✓	
Spain	✓		✓	✓					✓	
Sweden		✓	✓	✓	✓	✓	✓			
Switzerland	✓									
United Kingdom		✓	✓		✓	✓				
United States	(*)	(*)	✓	✓	(*)	(*)	✓	(*)	(*)	(*)

Source: Ren21 Renewables 2007 Global Status Report.

Annex 5. Distribution of CDM projects by sector



Source: UNFCCC Secretariat