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Improving Institutional Coherence: Managing Interplay Between Trade And Climate Change

Matthew Stilwell

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Matthew Stilwell

Matthew Stilwell is Managing Director of the Institute for Governance & Sustainable Development, and Visiting Fellow at the Centre on Trade and Economic Integration, Graduate Institute of International and Development Studies, Geneva. Comments are welcome to stilwell@bluewin.ch

Introduction

There is growing international agreement that climate change constitutes one of the "defining issues of our era".[1] The last year has seen a rising tide of public concern, as well as pronouncements by the world's leading scientific body on climate change, the Intergovernmental Panel on Climate Change (IPCC), that the evidence of global warming is now "unequivocal". In December 2007, these developments culminated in an agreement by Parties to the UN Framework Convention on Climate Change (UNFCCC) at the United Nations Climate Change Conference hosted in Bali, Indonesia, to launch a "comprehensive process" of negotiations to tackle the problem.

Both climate change and the responses it will require have major implications for economic activity and international trade. According to the Stern Review, authored by the former World Bank Senior Economist Sir Nicolas Stern, "climate change is the greatest market failure the world has ever seen".[2] Responding to climate change will therefore require new policies as well as a fundamental restructuring of energy, transportation, manufacturing, agriculture, and other key economic sectors world-wide.

As such, climate change is more than an environmental issue. Mitigating and adapting to climate change will require responses by multiple domestic and international agencies, including those addressing international trade. The importance of linkages between climate change and international trade was underpinned at a meeting of over thirty Trade Ministers and senior officials, taking place in the context of the Bali Climate Change Conference. At this meeting, Ministers "recognized the importance of concrete efforts to address climate change issues for the future of sustainable development and the mutually supportive linkages between climate change, international trade and development."[3]

This paper examines a set of issues arising from linkages between climate change and international trade, and from the international regimes addressing them. Discussion is organized around five key themes that are necessary (though not sufficient) elements in any effort to mitigate and adapt to climate change, and to achieve the development goals underpinning both the climate and trade regimes. These are: 1) promoting economic development and diversification; 2) transferring low-carbon and energy efficient technologies; 3) reforming subsidies; 4) enhancing polices and measures; and 5) addressing competitiveness concerns.

The paper is principally addressed to policy makers and negotiators working on issues of climate change and/or on international trade, as well as to other interested stakeholders. As a scoping paper, it seeks to raise a set of key issues and to identify areas for further

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[1] Ban Ki-Moon, UN Secretary General, Op-Ed, International Herald Tribune, 27 September 2007, available at http://www.iht.com/articles/2007/09/27/news/moon.php

[2] Stern Review: The Economics of Climate Change, Summary of Conclusions, at page viii, available at: http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm

[3] Chair's Summary, Trade Ministers Dialogue on Climate Change Issues, convened by the Government of the Republic of Indonesia in conjunction with UNFCCC COP 13, Kyoto Protocol MOP 3 in Bali, Indonesia, December 8-9, 2007 at page 1

discussion or research. It commences with an overview of the new challenges arising from climate change and the associated linkages to international trade. The paper then briefly introduces the climate and trade regimes, followed by a discussion of each of the main thematic issues. The paper concludes with some preliminary thoughts on ways to advance future discussions on climate and trade linkages.

New challenges of governance

According to the Intergovernmental Panel on Climate Change (IPCC), the evidence of climate change is now "unequivocal".[4] Evidence from all continents and most oceans now shows that natural systems are being affected by regional climate changes, particularly temperature increases.[5] The cause is very likely the increase in emissions from human activities since pre-industrial times, with an increase of 70% between 1970 and 2004.[6]

In the future, "emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century".[7] These include regional increases in heat waves, tropical cyclone intensity, and precipitation in high latitudes.[8] More extreme weather events and sea level rise are expected to have mostly adverse effects on natural and human systems[9], some of which may be "abrupt or irreversible".[10] Among other things, 20-30% of plant and animal species assessed so far are likely to be at increased risk of extinction in global average temperature increases 1.5-2.5°C over 1980-1999 levels (see Box for other impacts).

These findings by the IPCC are arresting. Yet the IPCC report arguably understates a range of important climate risks. It explicitly excludes uncertainties in climate-carbon cycle feedbacks and consequently the upper values of the ranges for sea level rise may be higher than noted.[11] The report also does not fully include ice dynamical processes seen in recent observations, which could increase the rate of ice loss.[12]

Some prominent scientists, such as NASA's climate scientist Dr. James Hanson, warn that we may have as little as 10 years before increasing atmospheric greenhouse gas concentrations reach the tipping point for abrupt, non-linear, and irreversible climate change in which natural systems – such as forests, oceans and melting permafrost and sea ice – become major sources of greenhouse gas emissions, triggering runaway climate

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[4] Intergovernmental Panel on Climate Change, *Fourth Assessment Report, Climate Change 2007: Synthesis Report, Summary for Policymakers,* page 1

[5] *Id.*, at pages 4 and 5

[6] *Id.*, at page 6

[7] *Id.*, at page 6

[8] *Id.,* at page 8

[9] *Id.,* at page 12

[10] *Id.,* at page 13

[11] *Id.*, at page 8

[12] *Id.*, at page 20

change, catastrophic rises in sea level and other devastating impacts.[13] According to UN Secretary General Ban Ki-Moon "the situation is so desperately serious that any delay could push us past the tipping point, beyond which the ecological, financial and human costs would increase dramatically".[14] While these may seem like the scenarios of science-fiction, the historical record captured in ice cores and other natural records demonstrate the capacity of the Earth's climate to change significantly in short time periods, in some cases in as little as a few decades.[15]

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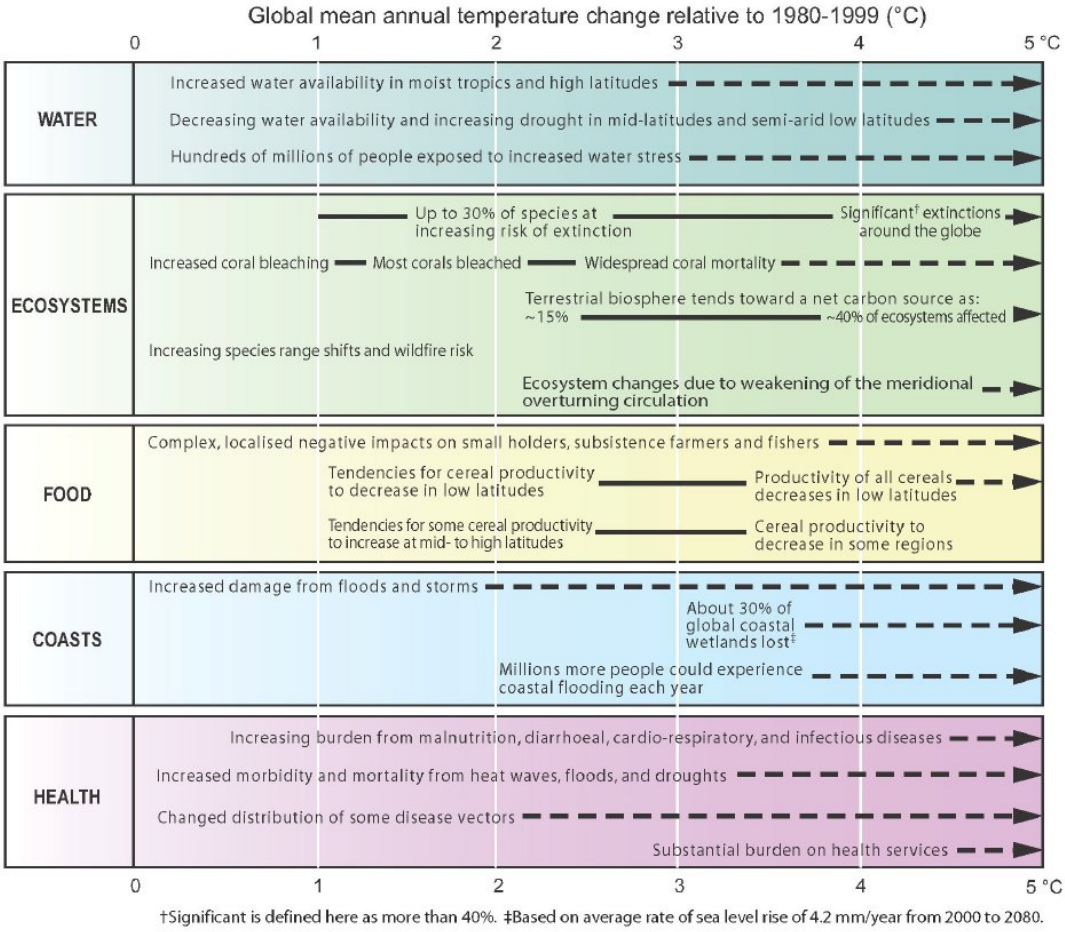
[13] James Hansen, *A Slippery Slope: How Much Global Warming Constitutes 'Dangerous Anthropogenic Interference"?* 68 Climate Change 269 (2005) at 276 (". . . global warming of more than 1° C above today's global temperature would likely constitute "dangerous anthropogenic interference" with climate."). *See also* James Hansen, *Why We Can't Wait*, THE NATION (7 May 2007) ("The Energy Department says that we're going to continue to put more and more CO_2 in the atmosphere each year--not just additional CO_2 but more than we put in the year before. If we do follow that path, *even for another ten years*, it guarantees that we will have dramatic climate changes that produce what I would call a different planet--one without sea ice in the Arctic; with worldwide, repeated coastal tragedies associated with storms and a continuously rising sea level; and with regional disruptions due to freshwater shortages and shifting climatic zones."). *See* James Hansen, *Press Conference: Leading Evangelicals, Scientists Launch Environmental Collaboration*, THE NATIONAL PRESS CLUB, THE CENTER FOR HEALTH AND THE GLOBAL ENVIRONMENT AT HARVARD MEDICAL SCHOOL, AND THE NATIONAL ASSOCIATION OF EVANGELICALS (17 January 2007). ("One quarter of carbon dioxide that we put in the air by burning fossil fuel will stay there forever – more than 500 years. If we burn all fossil fuels without capturing and sequestering the CO_2, we will create a different planet. We will destroy Creation.").

[14] Ban Ki-Moon, UN Secretary General, Speech at Twenty-Seventh Session of the Intergovernmental Panel on Climate Change in Valencia, Spain, 12-17 November 2007

[15] James Hansen, *Scientific Reticence and Sea Level Rise*, ENVT'L RES. LETT. (April-June 2007) ("The nonlinearity of the ice sheet problem makes it impossible to accurately predict the sea level change on a specific date. However, as a physicist, I find it almost inconceivable that BAU climate change would not yield a sea level change of the order of meters on the century timescale. The threat of a large sea level change is a principal element in our argument (Hansen et al 2006a, 2006b, 2007) that the global community must aim to keep additional global warming less than 1°C above the 2000 temperature, and even 1°C may be too great. In turn, this implies a CO_2 limit of about 450 ppm, or less. Such scenarios are dramatically different than BAU, requiring almost immediate changes to get on a fundamentally different energy and greenhouse gas emissions path."). *See also* James Hansen, A Slippery Slope: How Much Global Warming Constitutes 'Dangerous Anthropogenic Interference'? 68 CLIMATE CHANGE 269 (2005). Steve Connor, *If We Fail to Act, We Will End Up With a Different Planet*, THE INDEPENDENT, Jan. 1, 2007.

Examples of impacts associated with global average temperature change
(Impacts will vary by extent of adaptation, rate of temperature change, and socio-economic pathway)



Climate change thus threatens the ecological and economic foundations of the multilateral trading system. According to the Stern Review:

> …if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.[16]

These impacts will play out in a range of areas covered by trade negotiations. As trade negotiators seek to conclude agriculture negotiations, for example, climate change is projected to reduce output from rain-fed agriculture in some African countries by up to 50% by 2020.[17] In Asia, climate change is projected to compound pressures on natural resources and the environment associated with industrialization and economic

[16] *Stern Review: The Economics of Climate Change*, Executive Summary, available at http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

[17] Intergovernmental Panel on Climate Change, *Fourth Assessment Report, Climate Change 2007: Synthesis Report, Summary for Policymakers,* page 10 (Table SPM 2, Examples of some projected impacts)

development.[18] In Latin America, productivity of some important crops and livestock is projected to decline, with adverse consequences for food security.[19] Agricultural and forestry production is projected to decline over much of southern and eastern Australia by 2030.[20]

The effects are not limited to agriculture. For small island states, sea-level rise is expected threaten vital infrastructure and facilities that support the livelihood of island communities.[21] In Southern Europe, high temperatures and drought are expected to reduce water availability, hydropower potential and summer tourism.[22] Over the longer term, projected sea-level rise will affect low-lying coastal areas with large populations in Africa, with the cost of adaptation amounting to at least 5-10% of Gross Domestic Product (GDP).[23] Climate change is expected to have major effects on forests and fisheries, on human health, on infrastructure and water supply.[24]

Responding to climate change requires a rethinking of traditional development pathways. It requires action both to mitigate the emission of greenhouse gasses, and to adapt to the effects of climate change. Achieving this will require significant changes in the domestic policies and institutions governing a range of economic sectors – particularly energy production, industry, infrastructure, transportation, agriculture, forestry and waste management. At the same time, the process of responding to climate change at both the domestic and international level present new opportunities for development and for international trade. Climate-savvy countries and companies are establishing new industries, technologies and fuels, accessing new export markets, and participating in a billion dollar carbon finance market to fund their industrial development. Development pathways once seen as viable are being rendered uncertain and inhospitable by climate change, while new ones are opening up.

Realizing these opportunities, while avoiding a potential climate catastrophe, will require new forms of governance at the international level. At the December 2007 Bali Climate Change Conference, Parties to the UN Climate Convention agreed to continue discussions to strengthen the Kyoto Protocol and to launch negotiations concluding in 2009 as part of a comprehensive process to enable implementation of the Convention. Trade Ministers and officials, similarly, have begun to grapple with the importance of addressing climate change while promoting an open and predictable multilateral trading system.[25] These gatherings and others demonstrate a growing recognition that we are faced with a major challenge of governance.

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[18] *Id.*

[19] *Id.*

[20] *Id.*

[21] *Id.*

[22] *Id.*

[23] *Id.*

[24] The main sectors identified by the IPCC and by UNFCCC processes/documents in which particular efforts are required to help society adapt to the effects of climate change include: agriculture, forests and fisheries; water supply; human health; natural ecosystems (terrestrial and marine); coastal zones; and infrastructure.

[25] As noted in the introduction, over 30 trade ministers and senior officials met to discuss trade-climate linkages at the Trade Ministers Dialogue on Climate Change Issues, convened by the Government of the Republic of

Linkages between trade and climate change

How, in a carbon-constrained world, can we achieve the goals enshrined in the preamble of the WTO, the Climate Convention and in numerous other international instruments and declarations, of raising standards of living while protecting and preserving the environment in accordance with the objectives of sustainable development? A starting point in answering questions such as these is to better understand the linkages between international trade and climate change.[26]

Trade and climate change, and the respective domestic and international rules and institutions governing them, are linked in multiple ways. At a practical level – the level of the real economy and the natural environment – climate change is already affecting the productive base upon which international trade is based. International trade, in turn, may harm the climate by increasing the emissions from transportation and shipping, or contribute to reducing emissions by facilitating access to lower carbon products or technologies.

In the realm of policy, climate policies may have significant impacts for trade and competitiveness. The United States Congress, for example, is considering climate-related legislation that would include provisions designed to pass on some of the costs associated with domestic climate legislation to foreign products and producers seeking access to US markets. Trade policies, too, may influence climate change. Efforts to reduce tariff and non-tariff barriers to trade in environmental goods and services may reduce the costs and increase the availability of climate-related technologies, goods and services. Liberalization of trade in agriculture may increase or reduce pressures on agricultural communities struggling to adapt to climate change. Understanding the effects of climate and trade policies – both intended and unintended – on both trade and climate change is required in order to develop an effective framework.

Finally, trade policies and climate policies may intersect with each other as an issue of law. Domestic climate measures are likely to be scrutinized for their consistency with WTO rules, and international rules agreed as part of the post-Bali climate negotiations may conceivably give rise to tensions with WTO rules (though notably, the Kyoto Protocol does not include explicit trade-related measures comparable to those set out in certain other multilateral environmental agreements). Both the WTO and the climate regime are evolving through new negotiations. How these systems evolve and interact

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Indonesia in conjunction with UNFCCC COP 13, Kyoto Protocol MOP 3 in Bali, Indonesia, December 8-9, 2007. WTO members have discussed climate change in the context of the negotiations on environmental goods and services pursuant to paragraph 31(iii) of the Doha Ministerial Declaration, and identified renewable energy and energy savings management as categories of environmental goods appropriate for consideration in the negotiations.

[26] This section draws on the typology of linkages used in M. Stilwell, *Trade and Environment in the Context of Sustainable Development,* in *M. C. Cordonier Segger & C. G. Weeramantry, eds., Sustainable Justice: Reconciling Economic, Social & Environmental Law (*Leiden: Brill 2004), pp.87-120. For a more sophisticated analysis of linkages between trade and climate change, see A. Cosbey, *Trade and Climate Change Linkages,* A Scoping Paper produced for the Trade Ministers Dialogue on Climate Change Issues, Bali, Indonesia, December 8-9, 2007 (IISD, 2007).

will have a significant effect on the realization of the goals of each, and the development of a coherent body of international rules and institutions to address sustainable development.

The climate regime

The centrepiece of the international community's response to climate change is the UN Framework Convention on Climate Change. Agreed at the 1992 Rio Earth Summit, the Convention has been ratified by 192 parties and provides the basic framework for international cooperation to address climate change.

The treaty's objective includes "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".[27] This level must be achieved "within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."[28]

The Convention differentiates between the obligations of developed countries (included in Annex I) and developing countries (referred to as "non-Annex I" countries), in accordance with the principle of common but differentiated responsibility. Under the Convention, all parties agree to adopt certain measures and to take climate change into account in agriculture, industry, energy, natural resources, wastes and other key sectors.[29] Developed countries further agreed to: establish precise and regularly updated inventories of greenhouse gasses; take a lead in mitigating climate change; provide new and additional financial resources; and transfer technology to developing countries.[30]

In 1997, Parties to the Climate Convention agreed the Kyoto Protocol, setting out additional obligations requiring developed country (Annex I) Parties to reduce their greenhouse gas emissions. The Protocol commits these countries to reduce their emissions before 2012 to levels specified for each country in the Protocol, and collectively to levels of at least 5% below a 1990 baseline. The Protocol also requires Annex I parties to agree emission reduction obligations for a second and subsequent commitment periods (i.e. post-2012).

Recently, parties to the Climate Convention agreed in Bali, Indonesia, to continue negotiations on the second commitment period for developed countries under the Kyoto Protocol, and also to "launch a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012".[31] This process will focus on developing "a shared vision for long-term cooperative action, including a long-term global goal for emission

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[27] UNFCCC, Article 3

[28] *Id.*

[29] UNFCCC, Article 4(1)

[30] UNFCCC, Article 4(2)

[31] UNFCCC, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(a)

reductions".[32] It will also pursue enhanced action on four key "building blocks": mitigation, adaptation, technology development and transfer, and finance and investment.[33] The process is to be conducted in a subsidiary body known as the Ad Hoc Working Group on Long-term Cooperative Action under the Convention[34] and is scheduled to conclude by 2009.

The trade regime

Created by the Uruguay Round of trade negotiations, the WTO is both a set of legal agreements, and an organizational framework to administer the implementation of these agreements, settle trade disputes, and provide a forum for ongoing negotiations.[35] The WTO's founding agreement encourages governments to achieve its economic objectives, "while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so..."[36]

The WTO intersects with issues and institutions relating to climate change in a number of areas, including: 1) its legal rules and principles; 2) the activities of its committees and councils; 3) new negotiations under the Doha Ministerial Declaration; and 4) the enforcement of trade rules via the WTO dispute settlement system.

WTO rules and climate change

A number of WTO agreements intersect with climate change-related issues and institutions. The WTO is more than a "trade" organization in the traditional sense. Whereas the GATT focused primarily on liberalizing trade in goods,[37] the WTO promotes economic liberalization in a range of sectors, and reaches into national regulatory systems to address perceived impediments and distortions to international economic activity.[38] While it is institutionally structured to address three primary areas of activity – trade in goods, trade in services, and protection of intellectual property – its agreements also touch on a number of others including investment and government procurement.

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[32] *Id.*

[33] *Id.,* at paragraph 1(b) through 1(e)

[34] Id., at paragraph 2

[35] For further reading, *see* J.H. Jackson *World Trading System Law and Policy of International Economic Relations*, 1st ed. (Cambridge: MIT, 1997); A. Lowenfeld, *Public Controls on Internation Trade*, 2nd ed. (New York: M. Bender, 1983).

[36] *Marrakesh Agreement Establishing the World Trade Organization*, Preamble, April 15, 1994, reprinted in 33 I.L.M. 1144 (1994) [hereinafter "WTO Agreement"].

[37] *See* J.H. Jackson *World Trading System Law and Policy of International Economic Relations*, 1st ed. (Cambridge: MIT, 1997); A. Lowenfeld, *Public Controls on Internation Trade*, 2nd ed. (New York: M. Bender, 1983)..

[38] For further reading, *see* World Trade Organization, *Understanding the WTO*, 3rd ed. (Geneva: WTO, 2003) online: World Trade Organization <www.wto.org>.

Relevant WTO Agreements

- General Agreement on Tariffs and Trade (GATT) is the original framework for liberalizing trade in goods
- Agreement on Technical Barriers to Trade (TBT Agreement) provides more specific disciplines regarding national (or sub-national) technical regulations and non-binding standards
- Agreement on Subsidies and Countervailing Measures (SCM) disciplines both trade distorting subsidies, and the countervailing measures that may be taken in response
- Agreement on Agriculture promotes liberalization of trade in agricultural goods
- General Agreement on Trade in Services (GATS) establishes binding rules to liberalize international trade in services
- Agreement on Trade-Related Aspects of Intellectual Property (TRIPS Agreement) establishes uniform, minimum standards for the protection and enforcement of intellectual property rights
- The Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU) establishes procedures for the settlement of disputes arising under WTO agreements
- Agreement Establishing the World Trade Organization (WTO Agreement) establishes the WTO's overarching legal and institutional framework

As described below, many of these WTO agreements may have important consequences for efforts to address climate change, including by influencing the "policy space" available to domestic policy-makers to implement policies and measures to address climate change. So too will new obligations negotiated as part of the Doha Work Programme.

WTO negotiations and climate change

At the WTO's 4th Ministerial meeting in Doha, Qatar, Trade Ministers established a range of new negotiating mandates with implications for climate change. Some examples include:

- *Environmental goods and services.* Of particular relevance are negotiations under paragraph 31(iii) of the Doha Ministerial to reduce or eliminate tariff and non-tariff barriers on trade in environmental goods and services, including on goods and services that may help to address climate change. Some WTO Members have submitted lists of products for liberalization (EU, US and other countries), while others have suggested an "integrated" approach (India and Argentina) or the use of more specific "offers and requests" for liberalization (Brazil). In all cases, participants in the negotiation have identified energy efficient or low-carbon goods or technologies as part of the negotiation's product coverage.
- *Agriculture and non-agricultural market access.* Negotiations in areas such as agriculture and non-agricultural (industrial) market access will also influence the prospects of WTO Members and their capacity to respond to climate change. Responding to climate change will require major changes in both agricultural and industrial sectors. India, for instance, has estimated that "a 2 to 5°C increase in temperature can lower rice yields in India by 20 to 50 per cent and wheat yields by 35 to 60 per cent".[39] Ensuring that WTO negotiations promote, rather than undermine, the capacity of developing countries to diversify and adapt their agricultural and

[39] *Dealing with the Threat of Climate Change*, Indian Country Paper to the Gleneagles G8 Summit, 6-8 July 2005, at page 2

industrial sectors to a changing climate must therefore be considered a significant priority.

- *WTO-MEA relations.* The WTO is also addressing the relationship between WTO rules and specific trade obligations in Multilateral Environmental Agreements (paragraph 31(i) Doha Ministerial Declaration) and on information exchange between WTO bodies and MEA secretariats and criteria for observer status in WTO bodies (paragraph 31(ii) Doha Ministerial Declaration). Neither the Kyoto Protocol nor any likely future climate regime will include "specific trade obligations" (i.e. rules requiring countries to ban or limit trade), and so the paragraph 31(i) negotiations are of somewhat limited relevance to discussions of climate change. Addressing issues of observer status and information exchange under paragraph 31(ii), by contrast, may help promote coherence between the trade and climate regimes.

WTO bodies and climate change

These WTO negotiations, as well as the day-to-day work of the WTO, are administered by WTO committees and councils, which provide a forum in which WTO Members could raise the trade-related implications of climate policies and measures. In this context, the following bodies are particularly relevant:

- *The Committee on Trade and Environment* addresses a range of issues relating to the links between trade and environment.[40] The CTE has discussed the environmental benefits of removing trade-related restrictions in the energy, agriculture and forestry sectors, and has also discussed the effect of energy efficiency labeling on market access. The CTE meeting in Special Session (as a negotiating body) is negotiating the reduction or elimination of tariff and non-tariff barriers on trade in environmental goods and services, which include technologies and services required in efforts to mitigate or adapt to climate change.
- *The Committee on Technical Barriers to Trade* discusses issues arising in the implementation of the TBT Agreement, and could be called on to discuss technical regulations, standards and labeling designed to address climate change. In the past, for instance, the TBT Committee has discussed product regulations, standards and labeling requirements that relate to energy use and/or emission limitations.
- *The Council on Trade-related Aspects of Intellectual Property Rights* addresses issues arising from the WTO's intellectual property agreement and historically has discussed the impact of intellectual property rights such as patents on access by developing countries to environmentally sound technologies, and on implementation of multilateral environmental agreements such as the Convention on Biological Diversity. Intellectual property rights are already featuring in discussions about climate-related efforts to transfer low-carbon and energy efficient technologies.
- *The Council on Trade in Services* meeting in special session is addressing the services component of the WTO environmental goods and services negotiations. Many environmental goods and technologies – including those relevant to combating

[40] On the history of the Committee on Trade and Environment, see WTO, *Committee on Trade and Environment - Improving the Trade and Environment Pages of the WTO Website - Item 10 of the Work Programme - Note by the Secretariat,* WTO Doc. WT/CTE/WE/131, online: <http://docs-online.wto.org>.

climate change – are implemented in conjunction with related environmental services and so consideration of these issues together is essential in developing a more unified approach. The potential impact of services liberalization on developing countries' capacity to respond to climate change requires further examination.

- *The Committee on Trade and Development* addresses a range of issues arising from the linkages between trade and development.[41] This committee has not taken up development-related aspects of climate change. There is scope, however, for consideration of the impacts of climate change on development and how trade-related special and differential treatment, Aid for Trade, technical assistance and other development-oriented measures might improve adaptation to climate change and the successful realization of low-carbon development pathways.

Issues relating to climate change may also be considered, albeit less directly, in other WTO committees, councils and working groups, including the WTO Working Group on Trade and Transfer of Technology.

WTO enforcement and climate change

Enforcement and dispute settlement via the WTO's dispute settlement body may also come into play in the event that climate-related trade disputes can not be addressed through diplomatic or other channels. The WTO dispute settlement system is available to all WTO Members who believe their rights under WTO agreements have been infringed by a trading partner.

The WTO dispute settlement system comprises two levels of adjudication – panels and an Appellate Body – which are responsible for hearing disputes and offering recommendations to the WTO Dispute Settlement Body. The Dispute Settlement Body, in turn, is comprised of all WTO Members and must accept the recommendations of a panel or the Appellate Body unless it decides by consensus to reject them. Violating Members are usually required to bring their measure into conformity with WTO rules, or face claims for compensation or retaliation through trade sanctions.

The WTO dispute settlement system has addressed a number of cases covering environmental issues, though none relating directly to climate change.[42] It also includes a number of mechanisms that would support the consideration of climate-related factors. These include: 1) the use of procedures for good offices, mediation and consultation

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[41] For further reading, see United Nations Conference on Trade and Development website, online: <www.unctad.org>.

[42] See, for example, *United States – Standards for Reformulated and Conventional Gasoline,* AB-1996-1, WT/DS2/AB/R (1997) (Report of the Appellate Body) (involving a successful GATT challenge to US measures that addressed urban motor vehicle pollution by establishing minimum baselines for fuel quality); *United States – Import Prohibition of Certain Shrimp and Shrimp Products,* AB-1998-4, WT/DS58/AB/R (1998) (Report of the Appellate Body) (involving a successful GATT challenge to US measures banning the import of shrimp caught with fishing methods that threatened endangered species of sea turtles); and *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products,* AB-2000-11, WT/DS135/AB/R (2001) (Report of the Appellate Body) (involving an unsuccessful challenge under the TBT Agreement and the GATT to a French ban on imports of asbestos fibres and products containing them).

(Article 5) which are available to help avoid formal disputes and to ensure participation by MEA Secretariats and other experts; 2) the use of experts in dispute settlement on an *ad hoc* basis under Article 13(1); 3) establishment of Expert Review Groups under Article 13(2) and Appendix 4 to provide non-binding advisory opinions; and 4) increased use of environmental experts as panelists.

Framing the trade and climate debate

Linkages between climate change and trade give rise to a range of issues that must be addressed in a holistic and integrated manner in order to achieve the goals of the climate and trade regimes and to promote sustainable development. When framing this discussion, it would seem useful to identify a set of issues that are shared by the two regimes, and to find a set of themes or topics that can help to structure a dialogue. The following five issues constitute one such attempt to find a set of "bridging topics" that are sufficiently broad to allow a discussion of issue linkages, yet narrow enough to relate these topics back to specific aspects of the work programmes taking place in the climate and trade regimes. In each case, the paper summarizes the main issues, and then discusses the relevant obligations and activities of the climate and trade regimes, before offering some preliminary views on areas for further research or action.

Promoting economic development and diversification

Concerns about advancing economic development arise at the center of both trade and climate regimes. The WTO's preamble states that international relations in the field of trade and economic endeavor should be conducted with a view to raising standards of living and recognizes the need for positive efforts to enhance the trade prospects of developing countries.[43] The Climate Convention, similarly, aims to "enable economic development to proceed in a sustainable manner" and calls for cooperation to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties.[44]

Economic development, as well as a goal in its own right, is fundamental to coping with climate change. A society's capacity to mitigate and adapt to climate change is intimately

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[43] *Agreement Establishing the World Trade Organization, Preamble*, Reprinted in WORLD TRADE ORGANIZATION, THE LEGAL TEXTS – THE RESULTS OF THE URUGUAY ROUND OF MULTILATERAL TRADE NEGOTIATIONS 3-14 (1999), ("WTO AGREEMENT"). The WTO Appellate Body has referred to the Preamble of the WTO Agreement in several disputes. In the Report of the Appellate Body, *United States—Standards for Reformulated and Conventional Gasoline*, WT/DS2/AB/R (1997), at 28, the Appellate Body emphasized the importance of the objective of environmental protection, as contained in the preamble; in *United States— Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/AB/R, paragraph 159, the Appellate Body referred to the Preamble as support for its evolutionary interpretation of the term "exhaustible natural resources", stating that in view of the current state of ecological management, the term could not be understood as comprising only non-living natural resources. The Preamble to the WTO Agreement also reflects the extent to which the GATT/WTO system has developed to encompass environmental objectives in addition to its originally exclusively economic purpose. The Preamble to the GATT 1947 did not refer to the protection of the environment; rather it recommended the "full use of the resources of the world"

[44] UNFCCC Articles 2(1) and 3(5)

connected to its level of development, and to the diversity and strength of its economic base. According to the IPCC "making development more sustainable can enhance mitigative and adaptive capacities, reduce emissions, and reduce vulnerability, but there may be barriers to implementation."[45] According to the IPCC:

> The capacity to adapt is dynamic and is influenced by a society's productive base including: natural and man-made capital assets, social networks and entitlements, human capital and institutions, governance, national income, health and technology.[46]

Yet adaptive capacity is "is unevenly distributed across and within societies".[47] Enhancing adaptive capacity is thus crucial in many areas and economic sectors. Industrial sectors such as energy and infrastructure will increasingly be affected by climate-related natural disasters. Services sectors, such as tourism and transportation, will need to adapt to increased weather and climate variability. Few sectors, however, are more vulnerable to climate change and thus in need of greater efforts to strengthen development and build resilience than agriculture. This section consequently focuses on agriculture, though similar climate and trade-related concerns may arise in industrial and other economic sectors.

As noted in the introduction to this paper, the IPCC's assessment of regional climate impacts affecting agriculture offers a stark picture:[48]

- In Africa "by 2020, in some countries, yields from rain-fed agriculture could be reduced by up to 50%. Agricultural production, including access to food, in many African countries is projected to be severely compromised. This would further adversely affect food security and exacerbate malnutrition";
- In Latin America, "productivity of some important crops is projected to decrease and livestock productivity to decline, with adverse consequences for food security";
- In Asia, "by the 2050s, freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease";

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[45] IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report at page 19

[46] *Id.*, at page 14

[47] *Id.*

[48] The following quotes are drawn from, IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, Table SPM-2 "Examples of some projected regional impacts", page 10-11. Africa is likely to be hardest hit by climate change. The IPCC states:

> Agricultural production, including access to food, in many African countries and regions is projected to be severely compromised by climate variability and change. The area suitable for agriculture, the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. This would further adversely affect food security and exacerbate malnutrition in the continent. In some countries, yields from rain-fed agriculture could be reduced by up to 50% by 2020.

The IPCC projects that globally the potential for food production is projected to increase along with increases in local average temperature over a range of 1-3 degrees Centigrade, but above this is projected to decrease. See, *Climate Change 2007: Impacts Adaptation and Vulnerability*, Working Group II Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers and Technical Summary (IPCC, 2007), available at http://www.ipcc.ch/ipccreports/ar4-wg2.htm

- In Southern Europe, "climate change is projected to worsen conditions (high temperatures and drought) in a region already vulnerable to climate variability, and to reduce water availability, hydropower potential, summer tourism and, in general, crop productivity";
- In North America, "in the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5-20%, but with important variability among regions. Major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources"; and
- In Australia and New Zealand, "by 2030, production from agriculture and forestry is projected to decline over much of southern and eastern Australia, and over parts of eastern New Zealand, due to increased drought and fire."

How might these changes affect economic development and trade? Specific impacts will differ in different regions and under different response scenarios. While large uncertainties remain, the Overseas Development Institute notes that consensus across varying scenarios indicates "climate change will affect the prices and volumes of goods traded between developed and developing countries, particularly agricultural raw materials and food, with wider macroeconomic consequences."[49] In particular, dependence on a narrow set of products – agricultural or otherwise – can significantly increase vulnerability both to climate change and to the response measures taken by other states.

In Sub-Saharan Africa, for example, demand for cereals already outpaces production.[50] Yet under all climate scenarios, cereal productivity in this region is expected to decline[51], requiring a corresponding increase in food imports to sustain the region's population and ensure food security. Capacity to import, however, depends in large part on these countries' access to foreign exchange. Foreign exchange, in turn, is earned by many countries through the export of agricultural commodities. Climate change may thus create a "double dilemma" for development in this region – affecting both the capacity to produce food domestically, and to import it via the multilateral trading system.[52]

Enhancing the resilience and adaptive capacity of all economic sectors (and particularly of agriculture) thus presents an urgent priority for parties to the UN Climate Convention and WTO Members. Efforts to advance a development-oriented agenda through the

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[49] Overseas Development Institute, *Climate change and agriculture: Agricultural trade, markets and investment*, (ODI, 2007 (draft on file with author) at page 5

[50] *Id.,* at page 8

[51] *Id.,* at page 14

[52] The IPCC confirms that "Agricultural production, including access to food, in many African countries is projected to be severely compromised". The effects of climate change on agriculture in other regions will, however, differ. In North America, for instance, the IPCC states that "moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5-20%, but with important variability among regions", though it notes that "major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources". See, IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, Table SPM-2 "Examples of some projected regional impacts", page 10-11.

climate regime, and through the WTO – as part of the "Doha Development Agenda" or otherwise – must take into account new scientific consensus about the significant economic and development challenges posed by climate change.

Economic development and diversification in the climate regime

The UN Climate Convention affirms in its preamble that "responses to climate change should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty".[53]

The Convention calls for full consideration of the specific needs and special circumstances of developing countries, especially those that are particularly vulnerable to the adverse effects of climate change, and those that would have to bear a disproportionate or abnormal burden under the Convention.[54]

The Convention provides that Parties "have a right to, and should, promote sustainable development."[55] Policies and measures should therefore be appropriate for the specific conditions of each country and should be integrated with national development programmes, reflecting that economic development is essential for adopting measures to address climate change. Importantly, the Convention calls for efforts to address the needs and concerns of developing countries arising from the adverse effects of both "climate change and/or the impact of the implementation of response measures"[56].

In relation to agriculture, the Convention calls for efforts to develop and transfer technologies to reduce greenhouse gas emissions from agriculture and other relevant sectors.[57] It also calls on Parties to cooperate in preparing for adaptation to climate change in relation to agriculture, water resources and coastal zone management.[58]

Building on these references in the UN Climate Convention, the Kyoto Protocol calls on developed country (Annex I) Parties to promote "sustainable forms of agriculture in light of climate change considerations".[59] And it calls on all Parties to formulate national and

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[53] The Convention includes multiple references to the importance of economic development, in particular for developing countries. See, for example, the Convention's preamble as well as Articles 3(2), 3(4) and 4(7).

[54] UNFCCC, Article 3(2)

[55] UNFCCC, Article 3.4

[56] UNFCCC, Article 4(8)

[57] UNFCCC, Article 4(1)(b)

[58] UNFCCC, Article 4(1)(e). The Convention has also initiated a significant program on Land Use, Land Use Change and Forests (LULUCF). In Bonn, at the Fifth Conference of Parties, the UNFCCC endorsed a work programme and a decision-making framework on LULUCF. This has been followed up in subsequent Conference of Parties and by the SBSTA. For more information, see http://unfccc.int/methods_and_science/lulucf/items/3062.php

[59] Kyoto Protocol, Article 2.1(a)(iii)

where appropriate regional programmes for the agricultural sector containing measures to mitigate climate change and facilitate adequate adaptation to climate change.[60]

Within the climate regime, work on economic development and diversification has occurred principally under the umbrella of the Convention's discussions on adaptation, and in particular the need to address developing countries' concerns arising from climate change and associated response measures, especially those that are particularly vulnerable.[61] (see Box).

In relation to adaptation, early work has focused on identifying areas of vulnerability and appropriate responses. Over 40 developing countries have received funding to complete National Adaptation Programmes of Action.[62] In 2005, the Conference of Parties initiated the "Nairobi work programme", a five year programme of activities under the auspices of the Subsidiary Body for Scientific and Technical Advice (SBSTA) to develop, *inter alia*, scientific and technical methodologies and data necessary to identify and respond to impacts and vulnerability.[63]

[60] Kyoto Protocol, Article 10(b)(i)

[61] UNFCCC, Article 4(8) and (9)

[62] UNFCC, "Climate Change: Impacts, Vulnerabilities, and Adaptation in Developing Countries" 2007

[63] To date, activities targeting increasing economic resilience under the Naroibi work programme include the 2003 Tehran Workshop on Economic Diversification and a pre-sessional Expert Meeting on Economic Diversification at Bonn in 2006. The background note to the meeting examined the possible impacts of measures responding to climate change on developing countries, and the need to improve economic diversification, particularly in light of many developing countries dependence on commodities, and the potential impacts of Annex I countries climate response measures on commodity markets. See, Background Paper, Expert Meeting on Economic Diversification, Implementation of Article 4, paragraph 8 and 9 of the Convention. At the Bali Climate Change Conference, the Parties raised the possibility that an expert group may be necessary to further the Nairobi work programme. The issue will be raised again at the 14th Conference of the Parties.

Addressing the Adverse Impacts of Climate Change and Response Measures

…Parties shall give full consideration to what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures, especially on:

(a) Small island countries;
(b) Countries with low-lying coastal areas;
(c) Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;
(d) Countries with areas prone to natural disasters;
(e) Countries with areas liable to drought and desertification;
(f) Countries with areas of high urban atmospheric pollution;
(g) Countries with areas with fragile ecosystems, including mountainous ecosystems;
(h) Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products; and
(i) Landlocked and transit countries.

Further, the Conference of the Parties may take actions, as appropriate, with respect to this paragraph.

9. The Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.

Source: UNFCCC, Article 4, paragraphs 8 and 9

Most recently, the Bali Action Plan has called for "enhanced action on adaptation", including consideration of "economic diversification to build resilience".[64] It calls for "international cooperation to support urgent implementation of adaptation actions" including through "integration of adaptation actions into sectoral and national planning", "means to incentivize the implementation of adaptation actions" and "other ways to enable climate-resilient development and reduce vulnerability of all Parties".[65]

Economic development and diversification in the trade regime

Economic development – including in the field of agriculture – is a stated priority of the multilateral trading system. The WTO Agreement on Agriculture includes the long-term commitment to establish a fair and market-oriented trading system through a programme of fundamental reform encompassing strengthened rules and specific commitments on support and protection in order to correct and prevent restrictions and distortions in world agricultural markets.[66]

In the Doha Ministerial Declaration, WTO Members commit themselves to "to comprehensive negotiations aimed at: substantial improvements in market access;

[64] UNFCCC, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(c)(iv)
[65] UNFCCC, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(c)(i)
[66] WTO Doha Ministerial Declaration, paragraph 13

reductions of, with a view to phasing out, all forms of export subsidies; and substantial reductions in trade-distorting domestic support".[67] Importantly, they agreed:

> ...that special and differential treatment for developing countries shall be an integral part of all elements of the negotiations and shall be embodied in the schedules of concessions and commitments and as appropriate in the rules and disciplines to be negotiated, so as to be operationally effective and to enable developing countries to effectively take account of their development needs, including food security and rural development.[68]

During the negotiations, developing countries have raised a range of issues. There is a broad concern among some countries that multilateral negotiations on agriculture and their outcomes may adversely affect development prospects. Underpinning this is a concern that developing countries have in the past given up policy tools that can support their development, while developed countries have largely failed to address high levels of subsidization and protection of their own agricultural sectors. Liberalization of the agricultural sector may also increase their vulnerability to instability in commodity markets, risking food security and rural development. As noted by the Food and Agriculture Organization:

> As countries reduce tariffs and bind them at lower levels, they become increasingly vulnerable to external agricultural market instability and to import surges that could damage viable agricultural production activities. Vulnerability to such external shocks is of particular concern to developing countries endeavouring to develop their agricultural potential and to diversify production in order to enhance their food security and alleviate poverty.[69]

In light of these and other concerns developing countries have called for a range of measures in the context of current agriculture negotiation on market access, domestic support and export competition.[70] In relation to market access, calls have been made for[71]:

- *Lower tariff reductions, less tariff-rate quota expansion and longer implementation periods*, reflecting the principle of special and differential treatment and the need to

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[67] *Id.*

[68] *Id.*

[69] FAO Trade Policy Technical Notes, A Special Safeguard Mechanism for Developing Countries, No. 9 (See also, FAO, *The State of Food and Agriculture 2006* (Rome, 2006)

[70] Notably, the Agreement on Agriculture does include a range of measures for special and differential treatment: 1) provisions aimed at increasing trade opportunities for developing countries; 2) transitional time periods; 3) certain flexibilities of commitments, of action, and use of policy instruments; and 4) provisions relating to measures to least developed country Members. For further information, see WTO Secretariat, *Implementation of special and differential treatment provisions in WTO agreements and decisions,* 25 October 2000 *(*Document WT/COMTD/W/77).

[71] For an excellent summary of the following developing country concerns in the WTO Agriculture negotiations see, South Centre, *The Development Dimension of the Agriculture Negotiations*, Policy Brief No. 7, (April 2007)

support developing countries' development needs, including food security and rural development.

- *Establishment of a "Special Safeguard Mechanism"* for developing countries, which would allow developing countries to cope with fluctuations in prices and import surges.
- *Flexibility to designate "Special Products",* by self-identifying an appropriate number of tariff lines for reduced levels or rates of reduction on the basis of food security, rural livelihoods and rural development objectives.
- *Addressing preference erosion*, to ensure that preferential market access provided by some developed countries is not removed in a way that would harm those developing countries relying on those preferential market opportunities.

In relation to domestic support (i.e. domestic measures designed principally to maintain domestic prices above world prices, resulting in surpluses traded into the international market), developing countries have called for[72]:

- *Special and differential treatment* to provide developing countries with increased flexibility to put in place policy measures they require to promote diversification and development.
- *Cuts in Overall Trade-Distorting Support*, a measure reflecting the level of direct payments made to farmers to limit production, or support their incomes, and certain other associated measures (associated with the Amber and Blue Boxes and *de minimus* support).
- *Stronger criteria for exceptions and limitations,* to ensure that certain flexibilities (particularly those in the Amber and Green Boxes) are not abused.

In relation to export competition, developing countries have called for and end to export subsidies, flexibilities for net food importing countries and least developed countries, and exemptions for state trading enterprises with the goal of ensuring price stability and food security.[73] Many developing countries regard measures such as these as essential if WTO agriculture negotiations are to result in outcomes that support rather than hinder their development prospects, including their prospects of food security and rural development. Their importance is arguably heightened for countries that are vulnerable to agricultural disruption from climate change.

Discussion – economic development and diversification

Economic development and diversification are key goals for both the trade and climate regimes, and are particularly important if vulnerable states and their communities are going to weather the effects of climate change. Climate change will affect many economic sectors (see Annexes 1 and 2 for examples). As noted by one group of authors climate change will affect a variety of variables relating to agriculture and food security:

[72] *Id.*
[73] *Id.*

> Very few countries aim for, or achieve, food self sufficiency; trade in food products is the norm. Hence, the supply of food within a country is a function of: the volumes produced domestically, the price of imports (which in turn depends on global demand and supply), and the price of the exports used to generate foreign exchange. Climate change could affect all three of these variables.[74]

Indeed, climate change has potential to increase the vulnerability of many countries and regions, and to exacerbate existing vulnerabilities associated the volatility of international commodity markets and insufficient domestic diversification.[75] At the same time, it may increase agricultural production in other regions. The unevenness of these effects suggests changing patterns of trade, and new trade-related development issues.

In cases where states have the capacity to import products or services from abroad to address the domestic shortfalls caused by climate change or associated response measures (for example, importing food supplies to address shortfalls in domestic production), then international trade may help those states to adapt to the effects of climate change. In cases where trade liberalization or trade policies inhibit economic diversification or otherwise limit the flexibility of states, however, they may undermine efforts to adapt to climate change and promote development.[76]

International responses – if poorly designed – have the potential to undermine the ability of developing countries to adapt to climate change, creating barriers to developing country exports and effectively lowering demand for their products.[77] Adopting appropriate national and international trade policies may thus mean the difference between attaining food security and suffering inadequate food supplies under some climate change scenarios.

Improving our understanding of these linkages between agriculture, climate and trade is thus crucial – particularly for those countries which are most likely to be hardest hit by the negative effects of climate change. In particular, the scientific consensus on the risks of climate change in key regions suggests the value of re-examining of current

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[74] Overseas Development Institute, *Climate change and agriculture: Agricultural trade, markets and investment*, (ODI, 2007 (draft on file with author) at page 7

[75] See, for example, *Dealing with the Threat of Climate Change*, Indian Country Paper to the Gleneagles G8 Summit, 6-8 July 2005, at page 2:

> Climate change is a especially serious threat to a country like India, which is dependent on weather for its agricultural output. It is estimated that a 2 to 5°C increase in temperature can lower rice yields in India by 20 to 50 per cent and wheat yields by 35 to 60 per cent. Disruptions, droughts and floods induced by climate change can also cause great hardship and impose large costs. Land loss due to submergence as well as due to salination, increase of flooding of low-lying coastal areas can cause large displacement of population. A one metre sea level rise could lead to displacement of 7 million persons within the country and submerge half a million hectares of land.

[76] Of course, it is also relevant to consider the effect of climate measures on international trade – and the need for climate measures to be sensitive to international trade objectives, as well as for trade policies to be sensitive to climate objectives. Issues arising from the potential adverse effect of climate policies on competitiveness and international trade are considered below in the section entitled "Addressing competitiveness concerns".

[77] Overseas Development Institute, *Climate change and agriculture: Agricultural trade, markets and investment*, (ODI, 2007 (draft on file with author) at page 9.

discussions at the WTO, including in relation to the likely effect of WTO agricultural negotiation on the adaptive capacity, economic diversification and development in developing countries. Some steps in this direction could include the following:

- *Assess agriculture, trade and climate linkages.* A number of international organizations, including the UN Environment Programme, have developed sophisticated methodologies for assessing the environmental, social and economic impacts of trade liberalization and trade-related policies at national level, with the goal of assisting countries to maximize the development-related gains from trade liberalization.[78] Methodologies such as these, appropriately adjusted, could assist countries to evaluate and understand the likely impact of trade and trade liberalization on their prospects for food security and rural development, taking into account the likely impacts of climate change assessed on a regional or local basis. Here, the work of the IPCC Working Group II on Impacts, Assessment and Vulnerability would provide a strong basis for understanding likely climate impacts.[79] For developing countries in Africa, Asia and Latin America that are vulnerable to the impacts of climate change, assessing the impact of further trade liberalization on adaptive capacity would seem a priority.
- *Review the sufficiency of measures for special and differential treatment.* Developing countries may wish to re-evaluate the current Doha trade negotiations, including whether current proposals for special and differential treatment are sufficient in light of the projected effects of climate change on agricultural and non-agricultural sectors. How would enhanced access to developed country markets strengthen the capacity of developing countries to adapt to climate change? Are current proposals for Safeguard Mechanisms or Special Products sufficient to allow countries facing major climate-related shifts in agricultural productivity to adjust? What domestic support measures might be required in developing countries to protect small farmers and secure food security and rural development? In light of the significant uncertainty about the future effects of climate change, developing countries may wish to be careful when considering whether to bind themselves to future WTO commitments that may reduce their flexibility in responding to climate change and associated challenges of food security and development.

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[78] See, for example, UNEP, "*Reference Manual for the Integrated Assessment of Trade-Related Policies*," UNEP (Geneva, 2001), available at http://www.unep.ch/etu/publications/Envi_and_Trade.htm. UNEP's work in this field demonstrates both positive and negative links between trade and the environment:

> The results from the country projects show that the relationship between trade liberalization and the environment is complex, often indirect and mediated via effects on levels and patterns of production and consumption. Trade through changing patterns of production and consumption has beneficial and adverse effects for the environment: for example, increased trade can lead to the increased generation of financial resources to help overcome poverty and pay for environmental protection measures, but also to more pollution and natural resource depletion. Many factors influence what the particular mix of benefits and costs will be in different countries, at different stages of economic development, and under different policy and market conditions.

UNEP, *Economic Reforms, Trade Liberalization and the Environment: A Synthesis of UNEP Country Reports* (5 November 2001), available at http://www.unep.ch/etb/publications/TradeEnvi/synthesisround2.pdf

[79] See, for example, *Climate Change 2007: Impacts Adaptation and Vulnerability*, Working Group II Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers and Technical Summary (IPCC, 2007), available at http://www.ipcc.ch/ipccreports/ar4-wg2.htm

- *Identify other measures to support development, diversification and adaptation.* Parties to the UNFCCC may wish to identify appropriate trade, investment and financial policies to support economic diversification and adaptation to climate change. In particular, UNFCCC Parties could consider exploring how trade can support economic diversification in their efforts under Articles 4(8) and (9) of the Convention to reduce the adverse effects of climate change and/or the impact of the implementation of response measures. Economic diversification has also been identified as a key adaptation measure in the Bali Action Plan, which calls specifically for consideration of "economic diversification to build resilience".[80]
- *Improve cooperation among key stakeholders.* There is considerable scope to improve coordination among actors in the fields of agriculture, trade and climate change. Ensuring that the results of international trade and climate change negotiations support rural development and food security is critical, particularly to countries that are highly reliant on the agricultural sector for export income or for domestic livelihoods and well-being. Improved cooperation among relevant stakeholders can help to ensure that policies are developed and implemented in a way that maximizes the development benefits from the WTO and other negotiations. Meetings of trade officials on climate change, such as those conducted in Bali in December 2007, are potentially beneficial. But they would likely yield better coordination if they also include senior officials responsible for climate change.

Transferring low-carbon and energy efficient technologies

As well as economic diversification, technology plays a critical factor in mitigating and adapting to climate change. Many of the technologies required to address climate change may exist, but deploying them to successfully curb emissions in all major emitting sectors and countries as soon as the next 10 to 15 years as called for under IPCC scenarios will require a significant effort, and major changes in human behavior and institutions. Fortunately, the technologies required to address climate change already exist or will come on-line soon. According to the IPCC:

> There is *high agreement* and *much evidence* that all stabilisation levels assessed can be achieved by deployment of a portfolio of technologies that are either currently available or expected to be commercialised in coming decades, assuming appropriate and effective incentives are in place for their development, acquisition, deployment and diffusion and addressing related barriers.[81]

At the same time, the IPCC notes that "without substantial investment flows and effective technology transfer, it may be difficult to achieve emission reduction at a significant scale. Mobilizing financing of incremental costs of low-carbon technologies is

[80] UNFCCC, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(c)(iv)

[81] IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, at page 22. The "wedges" analysis undertaken by Pacala and Socolow similarly identifies a suite of existing technologies that are capable of curbing global greenhouse gas emissions by mid-century. See S. Pacala and R. Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, SCIENCE, 13 August 2004, Vol. 305, page 968-972.

important."[82] The challenge, then, is implementing measures to undertake the massive task of deploying these technologies within the next decade in all major emitting sectors and countries in order to "bend" our emissions curves down to levels that are not dangerous to the Earth's climate system.

Institutions of governance at all levels must play a role -- including global institutions such as the trade and climate regimes. Notably, technology plays a key role under the Climate Convention and its Kyoto Protocol, and has been framed as one of the essential "building blocks" of a future climate regime. Technology transfer has also featured prominently in discussions at the World Trade Organization.

Technology transfer under the climate regime

The Climate Convention obliges all parties to cooperate in the "development, application and diffusion" of technologies in all relevant sectors including the energy, transport, industry, agriculture, forestry and waste management sectors.[83] It also requires developed countries to provide "financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs" of implementing their core obligations under the Convention.[84] Notably, it calls for developed countries to "support the development and enhancement of endogenous capacities and technologies of developing country Parties."[85]

The Kyoto Protocol similarly calls for efforts to transfer technologies. Parties shall:

> Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries.[86]

Discussions of technology transfer have taken place within the Conference of Parties, the Subsidiary Body for Scientific and Technical Advice (SBSTA), the Subsidiary Body for Implementation (SBI) as well as in the Expert Group on Technology Transfer (EGTT). In accordance with the Marrakech Accords[87], discussions have addressed five main themes:

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[82] *Id.*

[83] UNFCCC, Article 4(1)(c).

[84] UNFCCC, Articles 4(3) and 4(5). Core obligations in this context refer to those set out in Article 4(1) of the Convention. Decision 4/CP.7 of the Convention's Conference of Parties addresses the development and transfer of technologies and establishes a framework for meaningful and effective actions to enhance the implementation of Article 4(5) of the Convention. The Kyoto Protocol's Article 11(2)(b) also provides that developed country Parties shall "provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1, of the Convention…".

[85] UNFCCC Article 4.5

[86] Kyoto Protocol, Article 10(c)

[87] *See* UNFCCC Conference of Parties, Decision 4/CP.7, for an overview of the Convention's efforts to create a framework for effective and meaningful technology transfer. Decision 4/CP.7 states, inter alia, "The successful development and transfer of [environmentally sound technologies] ESTs and know-how requires a

- Technology needs & needs assessments
- Technology information
- Enabling environments
- Capacity building
- Mechanisms for technology transfer

A number of the technology needs assessments under this framework have been undertaken on a sectoral basis, examining areas or categories such as energy, industry, forests, agriculture and wastes.[88] These assessments provide a preliminary overview of the technological needs of Parties to the Climate Convention in order to mitigate and adapt to climate change.

The recent Bali Climate Conference agreed a *Bali Action Plan* calling for "enhanced action on technology development and transfer to support action on mitigation and adaptation",[89] including consideration of "effective mechanisms and enhanced means for the removal of obstacles to, and provision of financial and other incentives for, scaling up of the development and transfer of technology" to developing countries.[90] (See Box)

In Bali, Parties to the UNFCCC also agreed two decisions relation directly to technology transfer. The first is a decision on "Development and transfer of technologies under the Subsidiary Body for Implementation", which ensures that technology transfer will be discussed in the context of funding and implementation, and not simply addressed a technical issue under Subsidiary Body for Scientific and Technical Advice.[91] The decision requests the Expert Group on Technology Transfer to, among other things, develop a set of performance indicators to evaluate the effectiveness of effort to implement the Convention's technology transfer obligations.

The Conference of Parties also adopted a decision on "Development and transfer of technologies under the Subsidiary Body for Scientific and Technological Advice", which calls for a range of actions including further efforts to identify technology needs, develop

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country-driven, integrated approach, at a national and sectoral level. This should involve cooperation among various stakeholders (the private sector, governments, the donor community, bilateral and multilateral institutions, non-governmental organizations and academic and research institutions), including activities on technology needs assessments, technology information, enabling environments, capacity building and mechanisms for technology transfer" (Decision 4/CP.7, Annex, paragraph 2, "Overall approach").

[88] See for example, Albania's technology assessment at http://ttclear.unfccc.int/ttclear/jsp/index.jsp?mainFrame=../html/TNAOverview.html. Other country assessments are available at: http://ttclear.unfccc.int/ttclear/jsp/index.jsp?mainFrame=../html/TNAOverview.html

[89] UNFCCC, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(d)

[90] UNFCCC, Conference of Parties, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(d)(i). Technology issues were also discussed, inter alia, in the Subsidiary Body for Scientific and Technical Advice and were newly introduced onto the agenda of the Subsidiary Body for Implementation, each of which issued a decision on this topic.

[91] UNFCCC, Conference of Parties, Decision -/CP.13, *Development and transfer of technologies under the Subsidiary Body for Implementation*

enabling environments, enhance capacity building, and scale up mechanisms and financing for technology transfer.[92]

UNFCCC Bali Action Plan: Technology Development and Transfer

The Bali Action Plan calls for:

Enhanced action on technology development and transfer to support action on mitigation and adaptation, including, inter alia, consideration of:

(i) Effective mechanisms and enhanced means for the removal of obstacles to, and provision of financial and other incentives for, scaling up of the development and transfer of technology to developing country Parties in order to promote access to affordable environmentally sound technologies

(ii) Ways to accelerate deployment, diffusion and transfer of affordable environmentally sound technologies

(iii) Cooperation on research and development of current, new and innovative technology, including win-win solutions

(iv) The effectiveness of mechanisms and tools for technology cooperation in specific sectors

Source: UNFCCC, Decision -/C.P.13, *Bali Action Plan*, at paragraph 2(d)

Technology transfer under the trade regime

The multilateral trade system may affect the transfer of technology to developing countries and implementation of technology-related obligations of the Climate Convention and its Kyoto Protocol. At least three items at the WTO are relevant to the issue of technology transfer: 1) the environmental goods and services negotiations; 2) the intellectual property (TRIPS) agreement; and 3) the WTO Working Group on Trade and Transfer of Technology.

Environmental goods and services

At the 2001 WTO Doha Ministerial Meeting, Trade Ministers agreed to negotiate the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services, with a view to enhancing the mutual supportiveness of trade and environment.

Underlying the mandate in paragraph 31(iii) of the Doha Ministerial Declaration is the view that reducing tariff and non-tariff barriers to trade in environmental goods and services can promote access to and use of environmental technologies and services. Environmental goods and services are produced and used by developed and developing countries alike and so liberalizing trade is seen as a way to improve market access and to

[92] UNFCCC, Conference of Parties, Decision -/CP.13, Development and transfer of technologies under the Subsidiary Body for Scientific and Technological Advice

further the commercial, environmental and developmental goals of WTO Members, simultaneously producing "win-win-win" outcomes.[93]

The negotiations have, nevertheless, proved challenging. In negotiations to liberalize trade in environmental goods, agreeing a definition of "environmental goods" has remained elusive. WTO Members have grappled with technical issues about the type and treatment of different kinds of environmental goods. More recently, differences have arisen over three alternative approaches to the environmental goods negotiations:

- *A list-based approach* has been proposed by a number of developed and transition countries including the European Union and the United States. This approach involves identifying a list of products for liberalization through a bottom-up or "defining by doing" approach and then agreeing to reduce or eliminate tariffs on these products. Recently, proponents of the list approach proposed new modalities[94] and agreed a reduced set of goods based on their importance to the environment and customs workability, which, in their view offer potential for a high degree of convergence among WTO Members (referred to as a "Potential Convergence Set").[95]
- *An integrated approach* has been proposed by India and Argentina and supported by a number of other developing countries. This approach calls on WTO Members to identify and agree on environmental activities (e.g. air pollution control, water and waste water management, and so on) and then identify a list of public and private entities that carry out these activities.[96] These lists would be negotiated and notified to the WTO, and all goods imported by the notified entities for use in the agreed activities would be granted preferential tariff treatment, as agreed by WTO Members.
- *An offer and request approach* has been proposed by Brazil as a means of breaking the deadlock between the list-based and integrated approaches. This approach would follow a more traditional negotiation process of requesting tariff cuts from trading partners on products of export interest, and then offering to make commensurate cuts in domestic tariffs in areas of interest to their exporters. Brazil has proposed this approach, in part, to ensure that ethanol-based biofuels are covered by the negotiations (as the United States and other developed countries have opposed inclusion of agricultural products in the mandate, seeking to focus it instead on industrial products).

Recently, the European Union and United States have proposed that WTO environmental goods and services negotiations focus specifically on liberalizing trade in climate-friendly environmental goods and services. They propose "two tier" process as part of a final agreement from the Doha negotiations. They first seek an agreement to liberalize trade in at least 43 goods with environmental benefits drawn from a World Bank list including

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[93] *Negotiations on Environmental Goods – Submission by the United States,* 9 July 2002, (TN/TE/W/8)

[94] *Market Access for Environmental Goods - Communication from Canada, European Communities, New Zealand, Norway, Singapore, Switzerland, and the United States*, 9 May 2006, (TN/MA/W/70
TN/TE/W/65)

[95] *Continued Work Under Paragraph 31(III) of the Doha Ministerial Declaration – Non-Paper by Canada, the European Communities, Japan, Korea, New Zealand, Norway, the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu, Switzerland, and the United States of America*, 27 April 2007, (JOB(07)/54)

[96] *Integrated Approach to Paragraph 31(III) – Submission by Argentina and India*, 6 June 2006, (JOB(07)/77)

solar panels and windmill turbines. They also call for a more far-reaching Environmental Goods and Services Agreement (EGSA) to be negotiated by WTO Members, which would foresee further binding commitments to eliminate tariffs and non-tariff barriers in trade in green technologies.

The proposal has received considerable criticism from developing countries, which argue that: 1) the 43 goods are merely a subset of a list of high-technology industrial products previously proposed by the European Union, United States and other countries; and 2) the second tier "EGSA" is largely a repackaging of the current negotiations on a broader set of goods and would cover all WTO Members excepting certain least developed and vulnerable countries. They also argue that the proposal systematically fails to address developing country concerns with the list approach, including the imbalance of product coverage in favour of high-technology products from developed countries, the absence of measures for special and differential treatment, and the absence of measures to bolster technology transfer with technical and financial support and capacity building.[97] A more holistic approach to achieving win-win-win outcomes from trade liberalization and technology transfer would arguably require:

- *Product coverage* that explicitly focuses on climate-friendly products of export interest to developing countries and on products required by developing countries to address specific adaptation and mitigation challenges. Ensuring balanced product coverage is a necessary step in that ensuring negotiations produce a true win-win-win outcome for trade, environment and development. Failing to do so risks locking in the technological dominance of developed countries in an important emerging area of global and domestic economies.
- *Tariff cuts* that are differentiated between developed and developing countries, in line with the principle of "less than full reciprocity" enshrined in the Doha Ministerial Declaration.[98] Calls by developed countries for tariff elimination or "zero tariffs" are difficult to reconcile with this principle, as they would require developed countries to make smaller, rather than larger, tariff cuts than developing countries (as developing countries have higher average tariffs). The likelihood of a "win" for development would increase significantly if the negotiations support domestic environmental industries, economic diversification and adaptive capacity in developing countries.
- *Special and differential treatment* in favour of developing countries, including transitional periods that are linked to development status and implementation capacity, and flexibility in product coverage to address specific needs for adaptation

[97] For a summary of concerns, see, South Centre, *Repackaging Old Positions: The "Bold New" US-EU Proposal on Trade Liberalization of Climate Friendly Goods and Services*, Informal Note for Bali Climate Conference, 5 December 2007 (on file with author)

[98] WTO Members have agreed that negotiations on non-agricultural market access must "take fully into account the special needs and interests of developing and least-developed country participants, including through less than full reciprocity in reduction commitments" (Doha Ministerial Declaration, paragraph 16). India and Argentina have proposed, in the context of the integrated approach, that developed countries could offer a 100 percent tariff concession as a measure for special and differential treatment while developing countries would offer a lower preference margin (JOB(07)/77). Least developed countries would offer any concession that they may individually decide (JOB(07)/77).

and mitigation and to foster the development of viable domestic environmental industries.[99]

- *Capacity building* to support technology identification and implementation.[100] The Doha Ministerial Declaration recognizes "the importance of technical assistance and capacity building in the field of trade and environment to developing countries, in particular the least-developed among them".[101] It also confirms that "technical cooperation and capacity building are core elements of the development dimension of the multilateral trading system".[102]
- *Financial assistance* to support technology identification and implementation. Reducing tariff and non-tariff barriers to environmental goods and services is one way of reducing the cost and increasing the availability of environmental technologies. A number of WTO Members have noted, however, that additional efforts are likely to be required to ensure effective transfer actually takes place in practice. As noted by the IPCC, "mobilizing financing of incremental costs of low-carbon technologies is important".[103] Additional finance to support the development of supply-side capacity for the production of climate-friendly goods and services in developing countries would help advance both trade and climate agendas.

Intellectual property rights

A second factor that may affect the development and transfer of climate-friendly technologies is the WTO's rules and institutions addressing intellectual property rights. The WTO's intellectual property (TRIPS) agreement establishes minimum standards for intellectual property rights and enforcement, including for patents over the products and processes required to help mitigate and adapt to climate change.

Views on the role of intellectual property in supporting environmental protection differ. On one hand, IPR protection can provide an incentive for individuals and companies to develop new technologies, and to transfer them to other countries via licenses, joint ventures or other means. On the other hand, overly strong IPR protection may limit technology transfer (e.g. by raising prices or reinforcing oligopolies) and, in some cases, may even undermine innovation (e.g. process patents limiting access to techniques required for innovation). Judgements about the effect of intellectual property rights on the

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[99] WTO Members have agreed that "the negotiations and the other aspects of the Work Programme shall take fully into account the principle of special and differential treatment for developing and least-developed countries…" (Doha Ministerial Declaration, paragraph 50). Any provisions for special and differential treatment should form an "integral part" of the outcome of the negotiations, and be "precise, effective and operational" (Doha Ministerial Declaration, paragraph 44). Cuba, for example, has stated that developing countries should decide the proportion of goods to be liberalized and the appropriate levels of reduction, and that tariff reductions by developed countries should be sufficient to ensure the entry of environmental goods identified for export by developing countries (TN/TE/W/69).

[100] A number of WTO Members have already supported capacity building for developing countries in the area of environmental goods (see, for example, the submission by Canada TN/TE/W/50).

[101] WTO Doha Ministerial Declaration, paragraph 33.

[102] WTO Doha Ministerial Declaration, paragraph 38.

[103] IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, at page 22

development and transfer of climate-friendly technologies must be made on a technology-by-technology and industry-by-industry basis.

According to Professor John Barton, intellectual property protection generally plays a different role in renewable energy industries than it does, for example, in the pharmaceutical sector.[104] The pharmaceutical sector is relatively concentrated and drugs are often without substitutes, so producers can charge prices well above production costs. Various sub-sectors of the renewable energy sector by contrast will be less concentrated, and some technologies are off-patent. Understanding the effect of patents in these sectors thus requires a careful analysis of the industry's structure, the extent of patent protection, the availability of substitute products as well as a range of related factors.

In the event that intellectual property rights are identified as affecting access to climate-friendly technologies, then the TRIPS Agreement includes a range of flexibilities that can be used by developing countries to enhance technology transfer. Provisions on compulsory licensing, for example, could be used to support public, non-commercial applications of technologies to help mitigate and adapt to climate change. WTO Members have acknowledged the importance of compulsory licensing in other situations of national emergency. The WTO Declaration on TRIPS and Public Health, for example, reaffirms "the right of WTO members to use, to the full, the provisions in the TRIPS Agreement, which provide flexibility for this purpose" (see Box).

[104] See, Barton, John, Intellectual Property and Access to Clean Energy Technologies in Developing Countries: An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies, ICTSD Issue Paper No. 2, available at www.ictsd.ch. Professor Barton concludes that "…for ethanol, the key concerns will be tariff and similar barriers, not IP barriers. For PV, the IP system is still unlikely to be a significant barrier. For wind energy, the issue is slightly less clear, but there will still probably be little IP problem. However, because of the global concentration in some of the industries, all countries should be alert to the risks of cartel behaviour", at page 7-8

WTO Declaration on the TRIPS Agreement and Public Health (Selected Provisions)

4. We agree that the TRIPS Agreement does not and should not prevent members from taking measures to protect public health. Accordingly, while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO members' right to protect public health and, in particular, to promote access to medicines for all.

In this connection, we reaffirm the right of WTO members to use, to the full, the provisions in the TRIPS Agreement, which provide flexibility for this purpose.

5. Accordingly and in the light of paragraph 4 above, while maintaining our commitments in the TRIPS Agreement, we recognize that these flexibilities include:

a. In applying the customary rules of interpretation of public international law, each provision of the TRIPS Agreement shall be read in the light of the object and purpose of the Agreement as expressed, in particular, in its objectives and principles.
b. Each member has the right to grant compulsory licences and the freedom to determine the grounds upon which such licences are granted.
c. Each member has the right to determine what constitutes a national emergency or other circumstances of extreme urgency, it being understood that public health crises, including those relating to HIV/AIDS, tuberculosis, malaria and other epidemics, can represent a national emergency or other circumstances of extreme urgency.
d. The effect of the provisions in the TRIPS Agreement that are relevant to the exhaustion of intellectual property rights is to leave each member free to establish its own regime for such exhaustion without challenge, subject to the MFN and national treatment provisions of Articles 3 and 4.

Source: WTO Declaration on TRIPS and Public Health

Technology transfer working group

WTO Members have recognized the importance of technology transfer. The Doha Ministerial Declaration calls for an examination "of the relationship between trade and transfer of technology, and of any possible recommendations on steps that might be taken within the mandate of the WTO to increase flows of technology to developing countries" (paragraph 37). To pursue this mandate, WTO Members established a WTO Working Group on Trade and Transfer of Technology. The Hong Kong Ministerial Declaration similarly recognizes "the relevance of the relationship between trade and transfer of technology to the development dimension of the Doha Work Programme" (paragraph 43).[105]

Discussion – transferring low-carbon and energy efficient technologies

For the trading system to make a meaningful contribution on technology transfer will require a systematic effort to identify relevant technologies in all major mitigation and

[105] The Working Group has met over twenty times with few tangible recommendations or results. For a report on its efforts see *Report of the Working Group on Trade and Transfer of Technologies to the General Council* (WTO document, WT/WGTTT/W/14)

adaptation sectors (see Box), the barriers to their transfer, and the role the trading system can play in removing these barriers.

Key Mitigation and Adaptation Sectors	
Mitigation sectors	**Adaptation sectors**
Energy supply	Agriculture, forests and fisheries
Industry	Water supply
Transportation	Human health
Buildings	Natural ecosystems (terrestrial and marine)
Waste	Coastal zones
Agriculture	Infrastructure
Forests	

At the Bali Climate Change Conference, Parties to the UN Climate Change Convention agreed that the Expert Group on Technology Transfer should, as part of its future work programme, develop a set of performance indicators that could be used by the Subsidiary Body for Implementation to regularly monitor and evaluate the effectiveness of the implementation of the technology transfer framework.[106] The *Bali Action Plan,* similarly, calls for efforts by developing country parties to mitigate greenhouse gas emissions, "supported and enabled by technology, financing and capacity-building, *in a measurable, reportable and verifiable manner*" (emphasis added).[107]

India has suggested the need for a new paradigm of international cooperation to address climate change, providing access to clean technologies, additional financial resources and research and development cooperation.[108] As part of this approach, they suggest that some intellectual property rights should be placed in the public domain for developing countries:

> One option would be to redefine the extent of patent protection for such technologies. The protection could exclude the use of such technologies in developing countries. Another option would be to establish a mechanism for the purchase of patent rights of certain technologies for their use in developing countries. Users in developing countries would then not be required to pay any license fees for these technologies. The patent holder could, however, continue to receive license fees for the use of the technology in industrialised countries.

Notably, the US Administration has also identified the need for an increase in global R&D funding and cooperation, expanding low-cost finance options, and a "global effort

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[106] UNFCCC, Conference of Parties, Decision -/CP.13, *Development and transfer of technologies under the Subsidiary Body for Implementation*

[107] UNFCCC, Conference of Parties, *Bali Action Plan*, paragraph 1(b)(ii)

[108] *Dealing with the Threat of Climate Change*, Indian Country Paper to the Gleneagles G8 Summit, INSERT DATE, at page 6

to share government-developed and owned technologies at low or no cost".[109] In the event that the TRIPS Agreement is viewed as providing insufficient flexibilities to address climate-related technology transfer requirements, then WTO Members could consider a waiver, interpretation or amendment of its provisions.[110]

Getting technologies onto the ground at a scale and rate required to avoid dangerous climate change will likely require an effort that is unprecedented in modern history – an effort similar in scale to the Marshall Plan implemented by the allied countries in the aftermath of World War II.[111] As well as access to sufficient finance and investment, accessing and implementing technologies will also require an effective enabling environment of policies and measures, including in certain cases subsidies.

Reforming subsidies

Subsidies can have both positive and negative implications for climate change.[112] Used well, subsidies can correct market failures and promote environmentally and socially sound behavior (e.g. a failure to internalize positive externalities). Used poorly, they can constitute policy failures that distort otherwise efficient markets, and promote behavior that is environmentally and socially unsound.[113]

In some cases, subsidies may have mixed economic, social and/or environmental effects. For example, in some cases distorting markets is necessary to protect social and cultural values or environmental resources. Many countries, for example, have implemented subsidy programs to reduce the costs of energy and promote development, with desirable

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[109] US Government, White House Power-point Presentation describing goals of Major Economies Meeting (on file with author). For a summary of home country measures relevant to securing technology transfer see also, UNCTAD, *Facilitating Transfer of Technology to Developing Countries: A Survey of Home-Country Measures* (UNCTAD/ITE/IPC/2004/5) available at http://www.unctad.org/en/docs/iteipc20045_en.pdf

[110] WTO Agreement, Article X, allows for "Any Member of the WTO may initiate a proposal to amend the provisions of this Agreement or the Multilateral Trade Agreements in Annex 1 by submitting such proposal to the Ministerial Conference" and provides "If consensus is not reached at a meeting of the Ministerial Conference within the established period, the Ministerial Conference shall decide by a two-thirds majority of the Members whether to submit the proposed amendment to the Members for acceptance". Article XI(2), in turn, provides "The Ministerial Conference and the General Council shall have the exclusive authority to adopt interpretations of this Agreement and of the Multilateral Trade Agreements." Article XI(3) provides "In exceptional circumstances, the Ministerial Conference may decide to waive an obligation imposed on a Member by this Agreement or any of the Multilateral Trade Agreements, provided that any such decision shall be taken by three fourths of the Members unless otherwise provided for in this paragraph."

[111] Yvo de Boer, Executive Secretary, UNFCCC Secretariat, Presentation to Major Economies Meeting on Energy Security and Climate Change, Honolulu, 30-31 January 2008, at page 3 (stating "What we need is what I have called a 'Climate Change Marshall Plan': a plan that will spur green, low-carbon economic growth worldwide, particularly in developing countries, that will reshape the world's future economy and redirect investment flows into a sustainable future.") The urgency of this effort is underpinned by the risk, identified by NASA's climate scientist James Hansen and others, that the tipping point for abrupt and irreversible climate change may be as little as a decade away.

[112] This section draws from: M. Stilwell, *Trade and Environment in the Context of Sustainable Development,* in *M. C. Cordonier Segger & C. G. Weeramantry, eds., Sustainable Justice: Reconciling Economic, Social & Environmental Law (*Leiden: Brill 2004), pp.87-120.

[113] For further reading, see *Reference Manual for the Integrated Assessment of Trade-Related Policies* (UNEP, 2002).

social but undesirable environmental outcomes. When and how subsidies should be applied, and the distribution of their costs and benefits on people within and between countries, are complex questions.

Subsidies play a notable role in causing and in combating climate change. Certain subsidies to the fossil fuel sector, for example, may distort trade and support environmentally harmful activities. Such subsidies would often be referred to as "perverse" given their tendency to cater to special interest groups, while causing wider economic and environmental problems. By contrast, other "positive" subsidies – such as those to encourage renewable or low-carbon technologies or industries – are required to mitigate and adapt to climate change and may have limited effects on trade. The IPCC, for instance, has noted that reducing fossil fuel subsidies, strengthening renewable energy obligations and producer subsidies, and providing subsidies in certain industry sectors can all help to mitigate climate change.[114]

Disentangling the effects of subsidies and promoting an integrated approach is likely to arise as a major challenge for the climate and trade regimes. As suggested by the International Institute for Sustainable Development's Global Subsidies Initiative, "while subsidies can play a legitimate role in public policy, those who advocate them must be able to demonstrate that the subsidies are environmentally, socially and economically sustainable—and that they do not undermine the developmental potential of other countries."[115]

Subsidies under the climate regime

The Kyoto Protocol requires developed country (Annex I) parties to reduce greenhouse gas emissions by implementing policies and measures such as the "progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments".[116]

Developed countries are also required to cooperate to "enhance the individual and combined effectiveness of their policies and measures", and "take steps to share their experience and exchange information on such policies and measures, including developing ways of improving their comparability, transparency and effectiveness." They are to do this 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".[117]

Efforts to phase out harmful subsidies (i.e. those running counter to the objectives of the Convention) must be balanced with efforts to put in place incentive measures and other polices to combat climate change. Both the Climate Convention and its Kyoto Protocol

[114] See following section for a fuller discussion of relevant measures.
[115] IISD, *The Global Subsidies Initiative* website, at http://www.iisd.org/subsidies/.
[116] Kyoto Protocol, Article 2.1(a)(v)
[117] Kyoto Protocol, Article 2.1(b) and 2.3.

call on all parties to implement national (and as appropriate regional) programs to address climate change. The IPCC has noted a range of areas where subsidies and other incentives will be required to support mitigation of climate change, or enhance adaptation to its effects. In the energy sector, for example, it identifies as appropriate policies the "reduction of fossil fuel subsidies" and the use of "producer subsidies" for renewable energy.[118] In industry sectors, it notes the potential value of subsidies in stimulating the uptake of efficient technologies.[119] Subsidies and tax credits can also potentially be used to support adaptation to climate change in the agricultural sector.[120]

To the extent that climate change represents a major market failure, subsidies and other incentive measures will be required to help internalize the benefits of combating climate change and stimulate changes in production and consumption.[121] A major challenge in reforming subsidies will be removing those perverse subsidies that currently cater to special interest groups while avoiding the creation of new ones, and building the positive incentives that are required to change behaviour in all relevant sectors of industry and society while, in the process, avoiding unnecessary impacts on other countries.

Subsidies under the trade regime

Subsidies are covered by a number of WTO agreements, including the Agreement on Agriculture and the General Agreement on Trade in Services. The primary agreement addressing subsidies, however, is the Agreement on Subsidies and Countervailing Measures (SCM), which disciplines both trade distorting subsidies, and the "countervailing" measures that may be taken by other countries in response to them.[122]

The agreement covers "specific subsidies", which are defined to include subsidies available only to an enterprise, industry, group of enterprises, or group of industries in the country (or state, etc) that gives the subsidy. The agreement classifies subsidies as "prohibited" or "actionable" depending on their trade impact. Prohibited subsidies include certain subsidies with serious trade implications, which must be removed

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[118] IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, Table SPM-5 "Selected examples of key sectoral mitigation technologies, policies and measures, constraints and opportunities", page 17

[119] Id.

[120] IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, Table SPM-4 "Selected examples of planned adaptation by sector", page 15.

[121] The Stern Review Report concludes:

> Climate change is the greatest market failure the world has ever seen, and it interacts with other market imperfections. Three elements of policy are required for an effective global response. The first is the pricing of carbon, implemented through tax, trading or regulation. The second is policy to support innovation and the deployment of low-carbon technologies. And the third is action to remove barriers to energy efficiency, and to inform, educate and persuade individuals about what they can do to respond to climate change.

STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE, Summary of Conclusions, at page viii. Available at: http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm

[122] For further reading, see Marc Benitah, *Law of Subsidies Under the GATT/WTO System* (New York: Kluwer Law International, 2002).

immediately once identified. Actionable subsidies are permissible, but may be challenged in WTO dispute settlements if they adversely affect the interests of other WTO Members.[123]

Discussion – enhancing subsidies

The trading system could conceivably contribute to addressing climate change by:

- *Protecting positive subsidies* from challenge under the SCM Agreement as "actionable subsidies";
- *Addressing perverse subsidies* by applying existing disciplines under the SCM Agreement on the basis that foreign subsidies are hurting domestic industries, limiting market access to foreign markets, and/or limiting access to third country markets; and
- *Enhancing WTO rules* by: 1) establishing exceptions for positive subsidies; and 2) strengthening disciplines on perverse subsidies, building on the WTO's experience with fisheries subsidies.

Protecting positive subsidies

One concern arising from the SCM Agreement is how it will be applied to subsidies designed to help address climate change. As noted by the IPCC, subsidies and other incentives may play a key role in a range of economic sectors – energy production, industry, agriculture, tourism – in promoting more climate-friendly behavior.

In some cases, these subsidies will fall in the category of "actionable" subsidies under the SCM Agreement. Subsidies in this category can be challenged by WTO members who believe their interests are adversely affected because another country's subsidy is: 1) hurting their domestic industries; 2) affecting their exporters market access to the subsidizing country's domestic market; or 3) damaging exporters from another country when the two compete in third markets.

Until 2000, the agreement established an automatic exemption for some government subsidies to help industries adapt existing facilities to new environmental requirements.[124] These exemptions, however, were not extended after 2000, raising questions about whether the agreement provides sufficient space for environmental subsidies. While there are no instances of formal legal challenges, future climate-related subsidies – such as those to promote efficient energy technologies or renewable energy – may well be subject to scrutiny as actionable subsidies, and may conceivably be found inconsistent with the SCM Agreement.

Even in the absence of a formal dispute, some WTO Members will likely use the SCM Agreement to place bilateral pressure on other countries to remove positive subsidies that

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[123] M. Stilwell, *Trade and Environment in the Context of Sustainable Development,* in *M. C. Cordonier Segger & C. G. Weeramantry, eds., Sustainable Justice: Reconciling Economic, Social & Environmental Law (*Leiden: Brill 2004), pp.87-120.

[124] WTO, Agreement on Subsidies and Countervailing Measures, Article 8.2(c)

are perceived to be adverse to their interests, which may have the effect of retarding or "chilling" the implementation of effective climate-related subsidy programmes. WTO Members should guard against such pressure where it runs counter to the objectives of the UN Climate Convention.

Removing perverse subsidies

The SCM Agreement offers potential to yield "triple-win" outcomes – for trade, environment and development – by removing perverse subsidies that distort trade, harm the environment, and limit developing countries' market opportunities. The International Institute for Sustainable Development states:

> In one of the few studies to date, the IEA has suggested that removing consumption subsidies alone in eight of the largest non-OECD economies would lower global CO2 emissions by 4.6%. And yet they persist; while the data is hard to come by, the IEA estimates energy subsidies overall in 2005 amounting to $250 billion, some $90 billion of which was devoted to oil products alone.[125]

To the extent that existing fossil fuels subsidies are actionable under the SCM agreement, WTO members could consider initiating action to remove or countervail them. IISD argues that progress on fossil fuel subsidies through the WTO is possible, but would require a number of prerequisites.[126] A key prerequisite is to improve the available data on fossil fuel subsidies and their economic, environmental and developmental impacts.

Who would commence a WTO challenge? Developing countries most adversely affected by fossil fuel subsidies – small island developing countries which are particularly vulnerable to climate change, for example, and/or major producers of bio-fuels or renewable technologies – could consider testing the provisions of the SCM in a challenge to specific fossil fuel subsidies. WTO Members, more generally, could agree to review the application of the SCM Agreement to subsidies that "run counter to the objective" of the Climate Convention. As developed country (Annex I) parties are already committed to reducing subsidies under both the Kyoto Protocol and the WTO, any evaluation of environmentally harmful and trade distorting fossil fuel subsidies could commence with an examination of subsidies by these countries.

Strengthening disciplines: Building on the WTO's experience with fisheries subsidies

WTO Members could also consider improving WTO disciplines by: 1) establishing exceptions for positive subsidies; and 2) strengthening disciplines on perverse subsidies,

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[125] International Institute for Sustainable Development, *Trade Policy Tools and Instruments for Addressing Climate Change and Sustainable Development*, A Scoping Paper for the Trade Ministers Dialogue on Climate Change Issues, Held in Conjunction with UNFCCC COP 13, Kyoto Protocol MOP 3, Bali, Indonesia, December 8-9, 2007, at page 8-9.

[126] Id.

building on the WTO's experience with fisheries subsidies.[127] Here, WTO Members may build on their experience reforming WTO disciplines as they relate to subsidies in the fisheries sector.

Fisheries subsidies contribute to over-capacity and over-fishing, with the effect of undermining the conservation of fish stocks and distorting international trade.[128] At the Doha Ministerial, WTO Members agreed to tackle fisheries subsidies by negotiating to improve WTO disciplines on fisheries subsidies (paragraph 28 and 31 of Ministerial Declaration).[129] Paragraph 28 of the Doha Ministerial Declaration provides that "participants shall also aim to clarify and improve WTO disciplines on fisheries subsidies, taking into account the importance of this sector to developing countries." The outcome of these negotiations will have important implications for sustainable fisheries management, and may set a precedent for the reduction of subsidies in other areas, such as climate change.

Since 2001, WTO Members have discussed appropriate rules and disciplines for fisheries subsidies. Towards the end of 2007, the chair of the negotiation proposed a draft text addressing the removal of fisheries subsidies. The text identifies eight categories of prohibited subsidies (e.g. acquisition of fishing vessels, income or price support (see Box)); it establishes general exceptions for certain desirable subsidies, such as those to improve safety or reduce environmental impact; it defines detailed measures for special and differential treatment for developing countries; it imposes a range of general disciplines on the use of subsidies (e.g. preventing harm to fish stocks migrating into another country's EEZ); and it requires countries using subsidies to implement fisheries management systems designed to prevent over fishing. Many of these elements could be adapted and applied to other sectors in which subsidies both distort trade and harm the environment and/or development – including in sectors that are important when addressing climate change.

One should not, however, understate the challenges in developing new disciplines on climate-related subsidies. As noted by IISD, considerable improvements in political will would be required to use the WTO to help reform energy subsidies as reform of both producer and consumer subsidies may meet with significant domestic opposition, even where reform is necessary and appropriate.[130] They also note that the WTO has typically steered clear of energy-related issues, in large part because of political concerns.[131]

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[127] The U.S. National Foreign Trade Council, for example, has stated in relation to subsidies and trade in biofuels that "The SCM Agreement may be one of the first WTO documents revised in overcoming this challenge". See, NTFC, "WTO Compatibility of Four Categories of U.S. Climate Change Policies" (2007).

[128] According to the World Trade Organization "A group of WTO Members calling themselves "Friends of Fish" (including Australia, Chile, Ecuador, Iceland, New Zealand, Peru, Philippines and the United States) say that subsidies to the fisheries sector—estimated at $14-$20.5 billion annually, or 20-25 per cent of revenues—have led to over-capacity and over-fishing." See http://www.wto.org/english/thewto_e/minist_e/min05_e/brief_e/brief08_e.htm

[129] For further reading, see C. Deere & C. Dommen, *Global Fisheries Subsidies and Sustainable Development Law* (to be submitted for publication to Lieden: Martinus Nijoff, 2005) (provisional title).

[130] *Id.*

[131] *Id.*

In the event that multilateral agreement to examine perverse energy could not be secured at the WTO, then a sub-set of WTO members could agree to negotiate a plurilateral agreement, or to negotiate outside the WTO.[132] In light of these considerations, efforts to reform subsidies will likely remain an important challenge for both the climate and trade regimes, and one area where there is potential for some synergy between them.

Prohibition of Certain Fisheries Subsidies

(a) Subsidies the benefits of which are conferred on the acquisition, construction, repair, renewal, renovation, modernization, or any other modification of fishing vessels[1] or service vessels[1], including subsidies to boat building or shipbuilding facilities for these purposes.

(b) Subsidies the benefits of which are conferred on transfer of fishing or service vessels to third countries, including through the creation of joint enterprises with third country partners.

(c) Subsidies the benefits of which are conferred on operating costs of fishing or service vessels (including licence fees or similar charges, fuel, ice, bait, personnel, social charges, insurance, gear, and at-sea support); or of landing, handling or in- or near-port processing activities for products of marine wild capture fishing; or subsidies to cover operating losses of such vessels or activities.

(d) Subsidies in respect of, or in the form of, port infrastructure or other physical port facilities exclusively or predominantly for activities related to marine wild capture fishing (for example, fish landing facilities, fish storage facilities, and in- or near-port fish processing facilities).

(e) Income support for natural or legal persons engaged in marine wild capture fishing.

(f) Price support for products of marine wild capture fishing.

(g) Subsidies arising from the further transfer, by a payer Member government, of access rights that it has acquired from another Member government to fisheries within the jurisdiction of such other Member.[1]

(h) Subsidies the benefits of which are conferred on any vessel engaged in illegal, unreported or unregulated fishing.

WTO Document *Draft Consolidated Chair Texts of the AD and SCM Agreements*, Annex VIII, Fisheries Subsidies, TN/RL/W/213

Enhancing policies and measures

Subsidies provide one important category of policies for addressing climate change, among others. More broadly, mitigating and adapting to climate change requires an effective framework of policies, rules and institutions at the domestic level. Among other things, domestic governance can play a key role in shifting behaviour by setting a price for carbon, supporting the deployment of energy efficient and renewable energy technologies, changing production and consumption patterns, and supporting mitigation and adaptation in specific economic sectors.

[132] *Id.*

Responding to climate change will arguably require a major reorientation of both macroeconomic and sectoral policies in key sectors for mitigation and adaptation.[133] In relation to mitigation, the IPCC has identified a range of measures including:

- Reduction of fossil fuel subsidies and taxes or carbon charges on fossil fuels;
- Renewable energy obligations and producer subsidies;
- Mandatory fuel economy, biofuel blending and CO_2 standards for road transport;
- Appliance standards and labeling in the building sector;
- Provision of benchmark information, performance standards, subsidies and tax credits in industrial sectors;
- Financial incentives and regulations for improved agricultural land management, maintaining soil carbon content, efficient use of fertilisers and irrigation in the agriculture sector; and
- Financial incentives for improved waste and wastewater management (See Annex 1 for a fuller list).

The IPCC also identifies a range of policies and measures for enhancing adaptation to climate change. These include:

- Financial incentives in the agriculture sector, e.g. subsidies and tax credits;
- Standards and regulations in relation to infrastructure that integrate climate change considerations into design;
- Integrated planning in the tourism sector and financial incentives, e.g. subsidies and tax credits;
- Integrating climate change considerations into national transport policy, investment in R&D for special situations; and
- National energy policies, regulations, and fiscal and financial incentives to encourage use of alternative sources, and incorporating climate change in design standards (See Annex 2 for a fuller list).

As suggested by the IPCC, standards, labelling and other regulations and incentives measures will play a key role in mitigating and adapting to climate change in sectors such as energy, biofuel, road transport, building, agricultural and other industrial sectors. In terms of standards, a wide range is available to governments when seeking to influence production, consumption and other behaviours to address climate change.

- *Product standards* establish the characteristics that products (such as consumer goods) must exhibit in order to reduce their contribution to climate change. Energy efficiency standards, for example, provide one important means of reducing energy intensity and improving efficiency.

[133] The climate regime has identified as key sectors for mitigation the energy supply, industry, transportation, building/infrastructure, agriculture, forestry and waste sectors. Key adaptation sectors have been variously identified as water, agriculture, infrastructure/settlement, human health, tourism, transport and energy. There is notably some overlap in these classifications.

- *Emission standards* limit the amount of carbon dioxide or other greenhouse gasses that a thing or facility may emit. These form an essential component of cap-and-trade systems developed at the local, national or regional level.
- *Performance standards* may require other actions or behaviours to meet a certain environmental standard. These are often focused on the process by which decisions are made or implemented, and would for example include requirements for environmental assessment or monitoring.

As well as standards, governments may use labelling and certification schemes – such as energy efficiency labelling or food miles – to reduce greenhouse gas emissions and combat climate change.[134] To implement their obligations under the UN Climate Change Convention, realize the opportunities presented by climate change (e.g. in terms of new products, markets and sources of finance) and mitigate and respond to the potentially devastating effects of climate change, countries will need to implement policies such as these in the near-term. As they do so, a range of WTO obligations are relevant when designing national measures to achieve their national objectives while avoiding undue impact on the economic prospects of their trading partners.

Policies and measures under the climate regime

The climate regime emphasizes the role of policies and measures. The Climate Convention commits all parties to establish specific national programs "containing measures to mitigate climate change" and to "facilitate adaptation to climate change".[135] It also requires them to take into account climate change in other "relevant social, economic and environmental policies and actions".[136] Climate policies and measures should also "be appropriate for the specific conditions of each Party and should be integrated with national development programmes".[137]

The Kyoto Protocol provides more specific guidance on the policies and measures available to developed country (Annex I) Parties to implement their emission reduction obligations. It identifies the need for policies and measures in a range of economic sectors, including forest management, agriculture, renewable energy and energy efficiency, transportation, and waste management.[138] It also calls for efforts to reduce or phase out "market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention".[139] When implementing policies and measures, Annex I Parties are to:

[134] Trade issues may also arise in relation to government procurement, where climate-related standards or labels are relied on by governments to distinguish between the products they purchase.
[135] UNFCCC Article 4(1)(b)
[136] UNFCCC Article 4(1)(f)
[137] UNFCCC Article 3(4)
[138] Kyoto Protocol, Article 2.1(a)
[139] Kyoto Protocol, Article 2.1(a)(v)

> …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…[140]

The Kyoto Protocol calls on all parties – including developing countries – to formulate national, and where appropriate regional, programs to mitigate and adapt to climate change in sectors including the energy, transport and industry sectors as well as agriculture, forestry and waste management.[141] Developed countries are to provide "financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs" of implementing these commitments.[142] Under the Kyoto Protocol, Annex I parties are required to reduce their emissions during a "first commitment period" running from 2008 to 2012. They are also required to agree "second and subsequent" commitment periods.[143] Notably, the Kyoto Protocol does *not* end in 2012 as often misreported in the media and other channels of communication.

Looking forward, the *Bali Action Plan* launches a process under which developed countries will enhance action on mitigation of climate change through "measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives … while ensuring the comparability of efforts among them, taking into account differences in their national circumstances.[144] Developing countries, in turn, will enhance mitigation through "nationally appropriate mitigation actions … in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner".[145]

Parties are to consider "various approaches, including opportunities for using markets, to enhance the cost-effectiveness of, and to promote, mitigation actions".[146] They are also called on to integrate adaptation into "sectoral and national planning" and to promote "economic diversification to build resilience".[147] One major challenge will be how to align this process with the existing commitments of Annex I parties under the Kyoto Protocol to reduce emissions during second and subsequent commitment periods. Regardless of how this is done, policies and measures will form a centerpiece of discussions in the development of a post-2012 climate regime.

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[140] Kyoto Protocol, Article 2.3. *See also* Article 3.14.

[141] Kyoto Protocol, Article 10

[142] Kyoto Protocol, Article 11.2(a). *See also* Decision 1/CP.10 and associated discussions under the Subsidiary Body for Implementation for a discussion of the adverse effects of climate change and the impact of the implementation of response measures.

[143] See, for example, Kyoto Protocol Article 3, paragraph 9, stating "The Conference of the Parties serving as the meeting of the Parties to this Protocol shall initiate the consideration of such commitments at least seven years before the end of the first commitment period". Article 3, paragraph 4, provides that certain decisions relating agriculture, land use change and forestry will apply to "second and subsequent commitment periods".

[144] UNFCCC, Conference of Parties, *Bali Action Plan*, paragraph 1(b)(i)

[145] UNFCCC, Conference of Parties, *Bali Action Plan*, paragraph 1(b)(ii)

[146] UNFCCC, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(b)(v)

[147] UNFCCC, Decision -/CP.13, *Bali Action Plan*, at paragraph 1(c)

Policies and measures under the trading regime

Among the principal goals of the multilateral trading system is ensuring that domestic policies and measures are not used as a disguised form of protectionism.[148] The WTO system has no rules specifically focused on climate change. Rather, it focuses generally on domestic regulations, and more specifically on domestic measures with particular trade impacts such as technical regulations and standards, product labelling or subsidies. In many cases, these WTO's rules will apply to domestic policies and measures implemented to achieve objectives relating to climate change.[149]

Participants in the multilateral trading system will often tend to view climate issues through the lens of the system's traditional principles and disciplines.[150] Seen in this way, climate and trade linkages are likely to be framed within the trading system in terms of:

- *Tariffs*. Reducing these border charges provides one means for reducing the cost and increasing the availability of climate-friendly goods and technologies. WTO disciplines (in the GATT Article II) require tariff cuts to be applied equally to the products of all WTO Members in a non-discriminatory manner.[151] As noted above, WTO negotiations to reduce tariffs and non-tariff barriers to trade in environmental goods and services may thus contribute to enhancing the transfer of climate-friendly technologies.
- *Quotas*. The WTO also prohibits the application of quotas and other quantitative measures to limit imports. Subject to limited exceptions, the GATT (in Article XI) prohibits WTO Members from placing quantitative limitations on the number or volume of products imported from trading partners, regardless of the carbon content or other characteristics of those products.
- *Non-discrimination obligations*. WTO Members must ensure that all domestic regulations – including those designed to help mitigate or adapt to climate change – do not discriminate between similar products imported from different trading partners (most-favoured nation obligation, Article I GATT) or between similar domestic and imported products (national treatment obligation, Article III GATT). WTO environmental exceptions in GATT Article XX permit limited derogations from these and other GATT rules.

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[148] While these are the stated objectives of the system, its rules and outcomes often reflect the balance of power among its parties – including the interests of its more powerful trading nations such as the European Union and the United States.

[149] This is also true in relation to virtually any other area of environmental policy. The fact that issues relating to climate change arise in relation to a number of WTO agreements does not of itself justify calls for any specific or cross-cutting focus on climate change at the World Trade Organization.

[150] The following list draws on the WTO Secretariat Presentation for the 2007 WTO Public Forum entitled *The Role of the WTO in the Climate Change Debate* (on file with author). For a sophisticated discussion of how these measures apply to the field of climate change see A. Cosbey and R. Tarasofsky, *Climate Change, Competitiveness and Trade*, A Chatham House Report, June 2007 (Royal Institute of International Affairs, 2007)

[151] This, however, is subject to the "Enabling Clause", which provides for limited application of tariff reductions on a discriminatory basis where preferential tariffs are designed to promote market access and development for developing countries.

- *Technical regulations and standards.* Energy efficiency standards, product standards for biofuels and other low-carbon energy sources, as well as a range of other domestic climate regulations and standards are subject the TBT Agreement, which requires such measures not to be "more trade restrictive than necessary" in order to achieve a legitimate policy objective. The TBT Agreement also favours measures that are based on international standards.
- *Labelling.* The TBT Agreement also covers government labelling schemes, such as those designed to inform consumers about the energy efficiency or carbon content of products. Labelling schemes must be satisfy a range of obligations relating to non-discrimination, transparency and trade restrictiveness. The TBT Agreement seeks to extend similar disciplines to private labelling schemes through a Code of Good Practice.
- *Subsidies.* Subsidies and other government incentives can contribute both to causing and to combating climate change. As noted above, the WTO Subsidies (SCM) Agreement includes disciplines on trade-distorting subsidies and the countervailing measures used to respond to them.
- *Services.* Many services sectors – energy, transportation, waste management, forestry, agricultural and others – require reform to enhance their contribution to climate protection. The WTO Services Agreement (GATS) seeks to liberalize trade in these services, and places certain restrictions on domestic regulation of services industries. Among other things, Article 6 of the GATS provides that domestic regulations must be "not more burdensome than necessary to ensure the quality of the service".
- *Intellectual property rights.* As noted above, intellectual property rights provide incentives that may influence the development and transfer of climate-friendly technologies. The TRIPS Agreement establishes minimum IPR standards, and permits "compulsory licensing" of technologies for non-commercial use under certain circumstances.
- *Government procurement.* In many countries governments are major consumers of goods and services. The use of government purchasing practices to encourage a shift to low-carbon technologies, goods and services provides one powerful means to change production and consumption patterns. Efforts to use government procurement in this way will likely be subject to the WTO's plurilateral Government Procurement Agreement.

The variety of potential climate policies and measures, as well as the variety of WTO rules, is diverse. Consequently, detailed analysis of interplay between the two regimes will require an in-depth analysis drawing on a specific policy or policies in the context of specific WTO rules.[152] A few general remarks are nevertheless possible.

One particular area of concern arises in relation to standards and labelling. Two main WTO agreements are particularly relevant in this context: the TBT Agreement and the GATT. The TBT Agreement applies to standards and labelling schemes falling within its

[152] For an excellent discussion of the application of WTO rules to possible options within domestic US legislation to address climate-related competitiveness concerns, see Pauwelyn, Joost, *U.S. Federal Climate Policy and Competitiveness Concerns: The Limits and Options of International Trade Law*, Nicholas Institute for Environmental and Policy Solutions, Duke University, April 2007.

definitions of "technical regulations" and non-binding "standards" (Annex 1). The GATT applies concurrently with the TBT Agreement to the extent that its provisions do not conflict with this agreement (WTO Agreement, General Interpretive Note to Annex 1A). To standards and labeling schemes falling within its definition of technical regulations, the TBT Agreement applies obligations regarding non-discrimination (Article 2.1), trade-restrictiveness (Article 2.2), preferential use of international standards (Article 2.4), notification requirements (Article 2.9), transparency (Article 10), technical assistance (Article 11), and special and differential treatment (Article 12), among others.

Government procurement also plays an important role in international trade, particularly as government spending may often constitute a considerable proportion of national GDP (often in the order of 10-15 percent). It may also play a role in efforts to mitigate and adapt to climate change, particularly where governments seek to reduce their own emissions or to use spending to influence the production and consumption patterns elsewhere in their society. The WTO Agreement on Government Procurement may also raise questions relating to standards and labelling where these are used in the context of their purchasing decisions.

Discussion – Enhancing policies and measures

Enhancing policies and measures is crucial if we are to change human behaviour and address climate change. At the same time, where possible, policies and measures should be developed and implemented in a manner that avoids undue impacts on a state's trading partners, particularly on developing countries. As reflected by Trade Ministers attending the Informal Trade Ministers Dialogue on Climate Change in Bali:

> A plethora of standards and labeling requirements linked to climate change targets could develop, some of which are valid, but others will be difficult to verity without a multilateral consensus. Such a situation would impose excessive compliance costs beyond the capacity of small producers or developing countries. Furthermore the absence of a consensus on standards could also lead to discriminatory practices and protectionism.[153]

In designing and implementing policies to address climate change, states can seek to understand and utilize the flexibilities in WTO rules. Clearly new and stronger policies and measures will be required to address climate change.[154] In designing and implementing these policies and measures, WTO agreements provide their members with a certain degree of policy space which they can use to tailor policies to their domestic needs. According to the South Center:

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[153] Chair's Summary, Trade Ministers Dialogue on Climate Change Issues, convened by the Government of the Republic of Indonesia in conjunction with UNFCCC COP 13, Kyoto Protocol MOP 3 in Bali, Indonesia, December 8-9, 2007, at paragraph 3.

[154] STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE, Summary of Conclusions, at page viii. Available at: http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm

> Policy space is about asserting the freedom of choice in terms of the development policies that countries can adopt and implement. For developing countries, it is about their freedom to choose the best mix of policies possible for achieving sustainable and equitable economic development given their unique and individual social, political, economic, and environmental conditions, taking into account considerations such as the existence of international commitments and disciplines that they may have voluntarily agreed to assume.

One are where flexibilities are available is the WTO intellectual property (TRIPS) agreement, as discussed above. While concerns have arisen about the TRIPS Agreement from a sustainable development point of view, states do retain a degree of flexibility in interpreting and applying the agreement. Among other things, WTO members have emphasized the importance of interpreting the agreement in light of its objectives and principles, including "the promotion of technological innovation and to the transfer and dissemination of technology … in a manner conducive to social and economic welfare" (Article 8, Objectives). The Agreement also provides that states may, "in formulating or amending their laws and regulations, adopt measures necessary to … promote the public interest in sectors of vital importance to their socio-economic and technological development". The Declaration on TRIPS and Public Health reaffirms that each WTO Member has the "right to grant compulsory licenses and the freedom to determine the grounds upon which such licenses are granted". They also have the right to "determine what constitutes a national emergency or other circumstances of extreme urgency".

Significant flexibilities are also available in other relevant WTO agreements that have implications for climate change. National policy-makers, when designing their domestic policies and measures, should consider how best to use the policy space available to them in WTO rules, while also bearing in mind the effect of their national measures on the competitiveness and development prospects of their trading partners.

Addressing competitiveness concerns

The shift to a low carbon economy and the policies promoting it can give rise to concerns about competitiveness. As noted by Pascal Lamy at the Informal Trade Ministers Dialogue on Climate Change in Bali on 8-9 December 2007:

> Some would like to see the trading system offset any competitive disadvantage they suffer in the course of climate change mitigation. More specifically, they would like to impose an economic cost on imported products at their borders equivalent to the one they suffer in curbing their own emissions. In other words, a "levelling of the playing field" of sorts, if you will, based on an importing country's perception of how that field may best be levelled.[155]

Firms and workers in Europe, for example, have expressed concern that domestic regulations designed to comply with the Kyoto Protocol will increase the costs and

[155] Pascal Lamy, Address to Informal Trade Ministers Dialogue on Climate Change in Bali on 8-9 December 2007, available at: http://www.wto.org/english/news_e/sppl_e/sppl83_e.htm

reduce the competitiveness of their activities vis-à-vis businesses in the United States, which has withdrawn from the Kyoto Protocol. French President Sarkosy, for example, has stated:

> …we must examine the possibility of taxing products imported from countries that do not comply with the Kyoto Protocol. We have imposed environmental standards on our producers. It is not normal that their competitors should be completely exempted …. I propose that within the next six months the European Union should debate the meaning of fair competition. Environmental dumping is not fair.[156]

The United States, in turn, has said it will not sign the Kyoto Protocol or a successor treaty unless large developing countries such as China and India take on comparable obligations to reduce their emissions.[157] A number of bills before the U.S. Congress propose measures to "level the playing field". America's Climate Security Act, for example, would call on importers to buy permits to cover the costs of the greenhouse gasses emitted during the production of their products. These provisions would apply in the context of a United States domestic cap-and-trade system, and would cover exports from countries that lacked a similar system.[158]

Measures such as these reflect the concern felt in many developed countries that the costs of complying with the domestic regulations, carbon taxes or cap-and-trade systems that are designed to implement international climate treaties will reduce the competitiveness of their firms in domestic and/or international markets. There is also concern that the energy intensive industries facing these costs – such as the chemical, steel and cement

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[156] Speech by the President of the French Republic at the Concluding Session of the Grenelle de l'Environnment, Thursday, 25 October 2007, at page 13. Issues relating to competitiveness and "free riding" have also been raised by EU Enterpirise Commissioner Verhuegen, and by Commission President Barroso in various forums, and were addressed in European Parliament Resolution 2005/2049 (which calls on the Commission to "take seriously into account the 'free rider' problem in the area of climate change mitigation; calls on the Commission and the Member States to investigate the possibility of adopting border adjustment measures on trade in order to offset any short-term competitive advantage producers *in industrialized countries* without carbon constraints might have…" (emphasis added))

[157] See, 11 June 2001 Speech by United States President George W. Bush (stating "This is a challenge that requires a 100 percent effort; ours, and the rest of the world's. The world's second-largest emitter of greenhouse gases is China. Yet, China was entirely exempted from the requirements of the Kyoto Protocol. India and Germany are among the top emitters. Yet, India was also exempt from Kyoto. These and other developing countries that are experiencing rapid growth face challenges in reducing their emissions without harming their economies. We want to work cooperatively with these countries in their efforts to reduce greenhouse emissions and maintain economic growth…. Kyoto is, in many ways, unrealistic. Many countries cannot meet their Kyoto targets. The targets themselves were arbitrary and not based upon science. For America, complying with those mandates would have a negative economic impact, with layoffs of workers and price increases for consumers. And when you evaluate all these flaws, most reasonable people will understand that it's not sound public policy") http://www.whitehouse.gov/news/releases/2001/06/20010611-2.html

[158] America's Climate Security Act (Senate bill 2191) was introduced by Senators Lieberman (Connecticut, Independent/Democrat) and Warner (Virginia, Republican), and has been reviewed favorably on 5 December 2007 by the U.S. Senate Environment and Public Works Committee. The other major proposal is that introduced by Senators Bingaman (New Mexico, Democrat) and Specter (Pennslvania, Republican) (Senate bill 1766). Each proposal requires the purchasing of emissions allowances for products imported from countries determined not to be making sufficient efforts to address climate change.

industries – will migrate to lower-cost business environments in countries without strong climate regulations, a tendency referred to as "carbon leakage".[159]

Developing countries point out, in response, that developed countries are responsible for the historical emissions that caused climate change and have the current financial and technical capacity to address the problem. They also note that per-capita emissions are significantly higher in developed than in developing countries, and that per-capita emissions in developing countries will need to rise if they are to achieve their economic development goals.[160] The balance struck in the Climate Convention and its Kyoto Protocol reflect these factors, in accordance with the principle of Common but Differentiated Responsibility, and consequently developed countries should not attempt to pass on the costs of complying with their Kyoto commitments through trade measures that, as well as running counter to the provisions of the climate regime, may also offend the spirit – if not the letter – of the WTO agreements.

In light of these views, it is clear that the economic stakes in this debate are high – and growing. It is therefore likely that issues relating to competitiveness will continue to arise in both the climate and trade regimes.

Competitiveness under the climate regime

Issues of competitiveness were front and centre during the negotiations of both the Climate Convention and its Kyoto Protocol, and the texts of these agreements broadly reflect the compromise struck in those discussions.

The Climate Convention notes in its preamble that "that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs". It notes that climate change calls for the widest possible cooperation by all countries "in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions".

The Convention's preamble recognizes that States should enact effective environmental legislation, and these "should reflect the environmental and developmental context to which they apply, and that standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries."

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[159] This phenomena is often discussed using the term "carbon leakage", a term that describes how when a greenhouse gas-intensive industries moves from a developed to a developing country (without emission caps) there may be no significant change in greenhouse gas emissions (the products will still be produced and exported to the developed country), but that that developed country's emissions will go down as the associated emissions will now occur outside its jurisdiction in a developing country.

[160] A principle argument here proceeds as follows: If the climate regime does imposes costs on developed countries, this reflects not "environmental dumping" by developing countries, but rather the historical "dumping" by developed countries of greenhouse gasses into the atmosphere since the industrial revolution. These countries are now merely being asked to bear the costs associated with their historical development.

The preamble also affirms that that "responses to climate change should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty". And it recognizes that to achieve sustainable social and economic development, energy consumption in developing countries "will need to grow taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general".

These preambular references reflect the Convention's wider emphasis on the principle of "common but differentiated responsibility" – the principle that all countries share a "common" responsibility for responding to climate change, but that this responsibility is "differentiated" according to their contribution to the problem, capacity to respond and different situations and contexts. As well as the preamble, this principle is referred to in the Convention's operative text where, for example, it notes:

> The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.[161]

More specifically, regarding the potential economic effects of climate change and measures to address climate change, the Convention provides that precautionary policies and measures "should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts".[162] Focusing specifically on trade-related measures, the Convention provides:

> The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. 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.[163]

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[161] UNFCCC, Article 3.1

[162] UNFCCC, Article 3.3

[163] UNFCCC, Article 3.5. Notably, the Climate Convention calls on Annex I parties to support developing countries to address climate change by providing financial and technical support, and transferring technologies, rather than through the use of punitive trade measures. Article 4.3 provides that developed countries will "provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs" of implementing key obligations under the Convention. Article 4.7 provides "The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will

Similar provisions exist in the Kyoto Protocol. Indeed, the Protocol is relatively specific about the need for developed countries to avoid adverse effects on developing countries. The Protocol provides that Annex I parties shall implement their domestic policies and measures to reduce emissions:

> …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.[164]

More generally, the Protocol calls on Annex I parties to "minimize adverse social, environmental and economic impacts on developing country Parties" when ensuring their aggregate emissions do not exceed the assigned amounts permitted under the Protocol.[165]

These provisions reflect the bargain struck within the climate regime – that, in light of their historical responsibility and current capacity, developed countries would take the lead in combating climate change, while supporting developing countries with technical and financial assistance and technology transfer, and minimizing the adverse effects on developing countries both of climate change and of Annex I parties' policies to address it.

As negotiations continue within the climate regime it is likely that issues of competitiveness will continue to arise. Larger developing countries such as Brazil, China, India, Mexico and South Africa are likely to come under increasing pressure to accept obligations to reduce emissions or risk facing trade-related measures designed to "level the playing field" and prevent their producers from gaining a competitive advantage in international markets. At the Bali Climate Conference, for example, Japan sought unsuccessfully to include language in the Bali Action Plan calling for a level playing field for "economic competitiveness".[166] Developing countries responded by raising concerns about domestic proposals in the European Union and the United States to use trade-distorting measures to "pass on" the costs of implementing the Kyoto Protocol to developing countries. Ultimately, the Bali Action Plan calls for consideration of the "economic and social consequences of response measures" – a likely place-holder for future discussions of competitiveness.

Competitiveness under the trade regime

Promoting open and competitive international markets is arguably a central goal of the multilateral trading system. Efforts by developed countries such as those described above to use unilateral and/or trade-restrictive measures to address competitiveness concerns are therefore likely come under close scrutiny by the WTO. Under pressure from domestic

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take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties."

[164] Kyoto Protocol, Article 2.3

[165] Kyoto Protocol, Article 3.14

[166] Statement by Japan at the UNFCCC Conference of Parties in Bali Indonesia, under the agenda item on the Report of the Co-Facilitators of the Dialogue on Long-Term Cooperative Action to Address Climate Change by Enhancing Implementation of the Convention.

industries or organized labour, governments may be tempted to impose a range of trade-related measures[167]:

- *Punitive tariffs or quantitative* measures could be imposed to ban or limit market access for products that are seen as harming the climate or failing to internalize the costs of climate-related environmental measures.
- *Anti-dumping duties* could be applied to the exports of foreign producers drawing on the argument that their goods that are produced in a manner that does not internalize the full (carbon-related) costs of their production, are exported at below their normal value and cause material injury to competing domestic industries. This seems to be the basis of "environmental dumping" arguments.
- *Anti-subsidy duties* could also be applied drawing on the argument that the failure by a government to impose suitable regulations, carbon taxes or carbon cap-and-trade systems constitutes a financial contribution that confers a benefit on industries or regions which causes an "injury", "serious prejudice" or a "nullification of benefits" expected from the GATT.
- *Border adjustment* of a domestic regulation or system that applies equally to foreign and domestic products (such as that proposed in America's Climate Security Act). Such a border adjustment could include the application of domestic carbon taxes to imported products or require the purchase of domestic carbon credits or other forms of emission allowances as a condition of entry into the market.

According to Professor Joost Pauwelyn, border adjustments of the final kind stand the greatest chance of surviving WTO scrutiny.[168] Notably, GATT Article II provides that the agreement's rules about maximum ceilings for tariffs do not present a WTO Member from:

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

WTO Members, in other words, could characterize their competitiveness measures as a WTO permissible "border adjustment" of a domestic cap-and-trade or carbon tax scheme.[169] If such a scheme does not discriminate between products from different exporting countries, and does not discriminate between domestic and imported products then it could be permissible under WTO rules.

Failing this, the proponents of such a measure might still argue it is justified under the environmental exceptions in GATT Article XX which permit measures relating to the conservation of exhaustible natural resources that are not arbitrary and that take into

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[167] The following typology is drawn from Joost Pauwelyn, *U.S. Federal Climate Policy and Competitiveness Concerns: The Limits and Options of International Trade Law*, Working Paper, Nicholas Institute for Environmental Policy Solutions, Duke University (April 2007)

[168] *Id.*

[169] *Id.,* at page 3

account the conditions of exporting countries. In applying any such provisions, it seems likely based on previous practice that a WTO adjudicatory body could take into consideration a range of factors including[170]:

- Whether the implementing country had made serious, good faith, across-the-board efforts to reach a negotiated solution with exporting countries in order to resolve issues relating to international competitiveness and/or related environmental issues before imposing unilateral measures (including, potentially, their good faith participation in relevant multilateral negotiations).
- The extent to which the measures reflect and take into account the different conditions which may occur in the territories of those other countries, and the comparability of efforts to work with those countries.
- The transparency and predictability of the process, the availability of review of decisions, the provision of formal, reasoned decisions in writing and other factors associated with due process.
- The relevant provisions of the Climate Convention and Kyoto Protocol which, as noted above, call on developed countries to take a lead in addressing climate change, provide supportive measures such as technology transfer and financial assistance, and explicitly call for efforts to minimize adverse effects on international trade and the economic prospects of developing countries.

Discussion – addressing competitiveness concerns

In light of these issues, competitiveness concerns will likely continue to arise in both the climate and trade regimes. Trade Ministers meeting at the Informal Trade Ministers Dialogue on Climate Change Issues in Bali emphasized the importance of minimizing potential for conflict between trade policies and broader objectives relating to climate change and development. The Chair's Summary of the meeting notes:

> Ministers discussed the potential for conflict from the inter linkages of trade and climate change objectives and policies, which will hurt developing countries most because of the potential costs and impact…. The idea of a carbon tax imposed at the border to offset competitive disadvantages caused by national differences in climate change targets could also lead to lack of certainty and potential protectionism in the absence of global consensus on climate change targets and uniform measures and pricing of carbon. Therefore Ministers emphasized the

[170] See, for example, *United States – Import Prohibition of Certain Shrimp and Shrimp Products,* AB-1998-4, WT/DS58/AB/R (1998) (Report of the Appellate Body). See also WTO Appellate Body Report: *United States – Import Prohibition Of Certain Shrimp and Shrimp Products* – Recourse to Article 21.5 of the DSU by Malaysia*,* AB-2001-4, WT/DS58/AB/RW (notably in this case, the WTO Appellate Body clarified its decision in the initial Shrimp decision by stating that the regulating/importing country need not actually reach agreement with exporting countries, but rather must make ongoing serious, good faith efforts to reach a multilateral agreement).

> importance and urgency to reach multilateral consensus for the post 2012 Kyoto Protocol Climate Change Framework in the next two years.[171]

The importance of addressing competitiveness concerns through multilateral climate negotiations, rather than through unilateral measures or through the WTO, was also emphasize by WTO Director General, Pascal Lamy, who has stated that "it is not in the WTO that a deal on climate change can be struck, but rather in an environmental forum, such as the United Nations Framework on Climate Change".[172] As states continue to develop the international climate regime, a number of options are available within the climate negotiations to help address concerns about competitiveness, among which are the following three.

- *Industry-level approaches.* One option is to focus on addressing competitiveness concerns on a voluntary industry-by-industry basis through approaches of the kind being discussed in the Asia-Pacific Partnership on Clean Development and Climate, a collaboration of seven partner countries (Australia, Canada, China, India, Japan, Republic of Korea, and the United States) focusing on the aluminum, building, cement, cleaner fossil fuel, coal mining, power generation and transmission, renewable energy and steel industries.[173] An emphasis on industries permits an integrated discussion of climate change and trade in the context of a specific industry. It allows consideration of competitiveness issues alongside other issues, such as technology transfer, finance and other efforts to reduce emissions or improve adaptive capacity. It will often require participation by a smaller number of countries, companies and other actors, making discussions less unwieldy. And solutions can be tailored to integrated considerations of mitigation, adaptation, technology and finance specific to the needs of the relevant industry. This approach does not require binding targets to be established on a sectoral basis, but rather emphasizes cooperation among industry and government partners on a voluntary basis.
- *Enabling measures.* A second means for addressing competitiveness concerns is to ensure that sufficient financial assistance and technology transfer is provided to developing countries to ensure they are able to reduce emissions and comply with any other obligations in the post-2012 climate regime. In the Ozone Regime, for example, a well designed financial mechanism (the Multilateral Fund) pays the incremental costs to developing countries of implementing key obligations, and supports the transfer of technologies required to reduce the generation and release of ozone depleting substances.[174] Parties, in other words, have addressed concerns about failure to comply and associated benefits to "free riders" through carrots as well as sticks. In the climate regime, dedicated sectoral funding mechanisms based on the model of the Montreal Protocol could be established within the context of the UN Climate

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[171] Chair's Summary, Trade Ministers Dialogue on Climate Change Issues, convened by the Government of the Republic of Indonesia in conjunction with UNFCCC COP 13, Kyoto Protocol MOP 3 in Bali, Indonesia, December 8-9, 2007, at paragraph 3.

[172] ICTSD, *Trade Ministers Discuss Links between Commerce and Climate Change in Bali,* Bridges BioRes, Volume 7, Number 22, 18 December 2007.

[173] See http://www.asiapacificpartnership.org/

[174] See, Institute for Governance & Sustainable Development, *Montreal Protocol's Key Lessons for Climate Negotiations*, available at www.ozone-climate.org

Convention, and funded by developed countries. The funding available through these mechanisms would benefit both developing countries, and the businesses supplying them with technologies (many of which are in the developed world), while also allaying concerns in developed countries that developing countries will be unwilling or unable to reduce greenhouse gas emissions and/or gain an unfair competitive advantage by doing so.

- *Compliance measures.* A third means for addressing competitiveness concerns a focus on compliance rather than on enabling measures. A robust post-2012 agreement including effective compliance mechanism would help to allay concerns that participating states will "free-ride" and gain a competitive advantage at the expense of others. Other multilateral environmental agreements (e.g. Montreal Protocol, the Basel Convention, the Convention on International Trade in Endangered Species, etc) include trade-related measures designed to reduce the incentives for states to remain outside the convention. Given the politics of global climate negotiations, however, it seems unlikely that Parties to the UN Framework Convention on Climate Change would agree to specific trade-related measures, or even to other multilateral approaches to address the free rider problem (for example, by requiring non-complying or non-participating states to purchase carbon credits or other emission rights as a condition for access to export markets). Nevertheless, an agreement with clear and enforceable obligations would help to address general concerns about free-riding, leakage and competitiveness. An effective compliance mechanism would also go some way to resolving competitiveness concerns.

Enhancing governance of climate change and trade

According to the Stern Review, "because climate change is a global problem, the response to it must be international. It must be based on a shared vision of long-term goals and agreement on frameworks that will accelerate action over the next decade, and it must build on mutually reinforcing approaches at national, regional and international level."[175] Pascal Lamy, Director General of the WTO, has similarly noted that "the relationship between international trade — and indeed the WTO — and climate change, would be best defined by a consensual international accord on climate change that successfully embraces all major polluters. In other words, until a truly global consensus emerges on how best to tackle the issue of climate change, WTO Members will continue to hold different views on what the multilateral trading system can and must do on this subject.[176] As policy-makers consider the architecture required to address climate change and related trade and competitiveness concerns it is submitted that they must, at a minimum, seek address the issues identified above – promoting economic development and diversification, transferring technologies, reforming subsidies, strengthening domestic policies, and managing competitiveness concerns – if the international system is

[175] Stern Review: The Economics of Climate Change, Summary of Conclusions, at page viii, available at: http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm

[176] Pascal Lamy, Address to Informal Trade Ministers Dialogue on Climate Change in Bali on 8-9 December 2007, available at: http://www.wto.org/english/news_e/sppl_e/sppl83_e.htm

to truly advance the goals of development and support the transition to a low-carbon and sustainable future.

Annex 1

IPCC: Selected examples of key sectoral mitigation technologies, policies and measures, constraints and opportunities

Sector	**Key mitigation technologies and practices currently commercially available.** ***Key mitigation technologies and practices projected to be commercialised before 2030 shown in italics.***	**Policies, measures and instruments shown to be environmentally effective**	**Key constraints or opportunities** **(Normal font = constraints;** ***italics = opportunities*****)**
Energy Supply	Improved supply and distribution efficiency; fuel switching from coal to gas; nuclear power; renewable heat and power (hydropower, solar, wind, geothermal and bioenergy); combined heat and power; early applications of Carbon Dioxide Capture and Storage (CCS) (e.g. storage of removed CO_2 from natural gas); *CCS for gas, biomass and coal-fired electricity generating facilities; advanced nuclear power; advanced renewable energy, including tidal and wave energy, concentrating solar, and solar photovoltaics*	Reduction of fossil fuel subsidies; Taxes or carbon charges on fossil fuels	Resistance by vested interests may make them difficult to implement
		Feed-in tariffs for renewable energy technologies; Renewable energy obligations; Producer subsidies	*May be appropriate to create markets for low emissions technologies*
Transport	More fuel efficient vehicles; hybrid vehicles; cleaner diesel vehicles; biofuels; modal shifts from road transport to rail and public transport systems; non-motorised transport (cycling, walking); land-use and transport planning; *Second generation biofuels; higher efficiency aircraft; advanced electric and hybrid vehicles with more powerful and reliable batteries*	Mandatory fuel economy, biofuel blending and CO_2 standards for road transport	Partial coverage of vehicle fleet may limit effectiveness
		Taxes on vehicle purchase, registration, use and motor fuels, road and parking pricing	Effectiveness may drop with higher incomes
		Influence mobility needs through land use regulations,	*Particularly appropriate for countries that are building up*

Sector	Key mitigation technologies and practices currently commercially available. *Key mitigation technologies and practices projected to be commercialised before 2030 shown in italics.*	Policies, measures and instruments shown to be environmentally effective	Key constraints or opportunities (Normal font = constraints; *italics = opportunities*)
		and infrastructure planning; Investment in attractive public transport facilities and non-motorised forms of transport	*their transportation systems*
Buildings	Efficient lighting and daylighting; more efficient electrical appliances and heating and cooling devices; improved cook stoves, improved insulation; passive and active solar design for heating and cooling; alternative refrigeration fluids, recovery and recycling of fluorinated gases; *Integrated design of commercial buildings including technologies, such as intelligent meters that provide feedback and control; solar photovoltaics integrated in buildings*	Appliance standards and labelling	Periodic revision of standards needed
		Building codes and certification	*Attractive for new buildings.* Enforcement can be difficult
		Demand-side management programmes	Need for regulations so that utilities may profit
		Public sector leadership programmes, including procurement	*Government purchasing can expand demand for energy-efficient products*
		Incentives for energy service companies (ESCOs)	*Success factor: Access to third party financing*
Industry	More efficient end-use electrical equipment; heat and power recovery; material recycling and substitution; control of non-CO_2 gas emissions; and a wide array of process-specific technologies; *Advanced energy efficiency; CCS for cement, ammonia, and iron manufacture; inert electrodes for aluminium manufacture*	Provision of benchmark information; Performance standards; Subsidies, tax credits	*May be appropriate to stimulate technology uptake.* Stability of national policy important in view of international competitiveness
		Tradable permits	Predictable allocation mechanisms and stable price signals important for investments

Sector	Key mitigation technologies and practices currently commercially available. *Key mitigation technologies and practices projected to be commercialised before 2030 shown in italics.*	Policies, measures and instruments shown to be environmentally effective	Key constraints or opportunities (Normal font = constraints; *italics = opportunities*)
		Voluntary agreements	Success factors include: clear targets, a baseline scenario, third party involvement in design and review and formal provisions of monitoring, close cooperation between government and industry
Agriculture	Improved crop and grazing land management to increase soil carbon storage; restoration of cultivated peaty soils and degraded lands; improved rice cultivation techniques and livestock and manure management to reduce CH_4 emissions; improved nitrogen fertiliser application techniques to reduce N_2O emissions; dedicated energy crops to replace fossil fuel use; improved energy efficiency; *Improvements of crop yields*	Financial incentives and regulations for improved land management, maintaining soil carbon content, efficient use of fertilisers and irrigation	*May encourage synergy with sustainable development and with reducing vulnerability to climate change, thereby overcoming barriers to implementation*
Forestry/ forests	Afforestation; reforestation; forest management; reduced deforestation; harvested wood product management; use of forestry products for bioenergy to replace fossil fuel use; *Tree species improvement to increase biomass productivity and carbon sequestration. Improved remote sensing technologies for analysis of vegetation/ soil carbon*	Financial incentives (national and international) to increase forest area, to reduce deforestation, and to maintain and manage forests; Land-use regulation and enforcement	Constraints include lack of investment capital and land tenure issues. *Can help poverty alleviation.*

Sector	Key mitigation technologies and practices currently commercially available. ***Key mitigation technologies and practices projected to be commercialised before 2030 shown in italics.***	Policies, measures and instruments shown to be environmentally effective	Key constraints or opportunities (Normal font = constraints; ***italics = opportunities***)
	sequestration potential and mapping land use change		
Waste	Landfill CH_4 recovery; waste incineration with energy recovery; composting of organic waste; controlled waste water treatment; recycling and waste minimisation; *biocovers and biofilters to optimise CH_4 oxidation*	Financial incentives for improved waste and wastewater management	*May stimulate technology diffusion*
		Renewable energy incentives or obligations	Local availability of low-cost fuel
		Waste management regulations	Most effectively applied at national level with enforcement strategies

Source: IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, Table SPM-5

Annex 2

IPCC: Selected examples of planned adaptation by sector

Sector	Adaptation option/strategy	Underlying policy framework	Key constraints and opportunities to implementation (Normal font = constraints; *italics = opportunities*)
Water	Expanded rainwater harvesting; water storage and conservation techniques; water re-use; desalination; water-use and irrigation efficiency	National water policies and integrated water resources management; water-related hazards management	Financial, human resources and physical barriers; *integrated water resources management; synergies with other sectors*
Agriculture	Adjustment of planting dates and crop variety; crop relocation; improved land management, e.g. erosion control and soil protection through tree planting	R&D policies; institutional reform; land tenure and land reform; training; capacity building; crop insurance; financial incentives, e.g. subsidies and tax credits	Technological & financial constraints; access to new varieties; markets; *longer growing season in higher latitudes; revenues from 'new' products*
Infrastructure/settlement (including coastal zones)	Relocation; seawalls and storm surge barriers; dune reinforcement; land acquisition and creation of marshlands/wetlands as buffer against sea level rise and flooding; protection of existing natural barriers	Standards and regulations that integrate climate change considerations into design; land use policies; building codes; insurance	Financial and technological barriers; availability of relocation space; *integrated policies and managements; synergies with sustainable development goals*
Human health	Heat-health action plans;	Public health policies that	Limits to human tolerance

	emergency medical services; improved climate-sensitive disease surveillance and control; safe water and improved sanitation	recognise climate risk; strengthened health services; regional and international cooperation	(vulnerable groups); knowledge limitations; financial capacity; *upgraded health services; improved quality of life*
Tourism	Diversification of tourism attractions & revenues; shifting ski slopes to higher altitudes and glaciers; artificial snow-making	Integrated planning (e.g. carrying capacity; linkages with other sectors); financial incentives, e.g. subsidies and tax credits	Appeal/marketing of new attractions; financial and logistical challenges; potential adverse impact on other sectors (e.g. artificial snow-making may increase energy use); *revenues from 'new' attractions; involvement of wider group of stakeholders*
Transport	Realignment/relocation; design standards and planning for roads, rail, and other infrastructure to cope with warming and drainage	Integrating climate change considerations into national transport policy; investment in R&D for special situations, e.g. permafrost areas	Financial & technological barriers; availability of less vulnerable routes; *improved technologies and integration with key sectors (e.g. energy)*
Energy	Strengthening of overhead transmission and distribution infrastructure; underground cabling for utilities; energy efficiency; use of renewable sources; reduced dependence on single sources of energy	National energy policies, regulations, and fiscal and financial incentives to encourage use of alternative sources; incorporating climate change in design standards	Access to viable alternatives; financial and technological barriers; acceptance of new technologies; *stimulation of new technologies; use of local resources*
Forestry/ forests	Afforestation; reforestation; forest management; reduced deforestation; harvested wood product management; use of	Financial incentives (national and international) to increase forest area, to reduce	Constraints include lack of investment capital and land tenure issues. *Can help poverty*

	forestry products for bioenergy to replace fossil fuel use; *Tree species improvement to increase biomass productivity and carbon sequestration. Improved remote sensing technologies for analysis of vegetation/ soil carbon sequestration potential and mapping land use change*	deforestation, and to maintain and manage forests; Land-use regulation and enforcement	*alleviation.*
Waste	Landfill CH_4 recovery; waste incineration with energy recovery; composting of organic waste; controlled waste water treatment; recycling and waste minimisation; *biocovers and biofilters to optimise CH_4 oxidation*	Financial incentives for improved waste and wastewater management	*May stimulate technology diffusion*
		Renewable energy incentives or obligations	Local availability of low-cost fuel
		Waste management regulations	Most effectively applied at national level with enforcement strategies

Source: IPCC Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, Table SPM-4

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The Global Economic Governance Programme
University College, Oxford OX1 4BH

Tel. +44 (0) 1865 276 639 or 279 630
Fax. +44 (0) 1865 276 659
Email: geg@univ.ox.ac.uk
www.globaleconomicgovernance.org