

Dialogue **on** Globalization

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Trade and Climate Change

Triggers or Barriers for Climate
Friendly Technology Transfer and
Development?

Dialogue on Globalization

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1. Preface

Skeptics would argue that the financial crisis has pushed climate change and sustainable energy policy from the top of the global agenda. Given the dramatic long range economic and security problems stemming from climate change and the end of fossil energy, it is safe to predict that climate and energy policy will remain a priority for years to come. The critical UN Climate Conference in Copenhagen in December 2009 will bring back the focus on the need for a climate governance regime. A global coalition including progressive political parties, the international trade union movement and NGOs is pushing for a “green new deal” as a strategic answer to current economic, climate, energy and security challenges. Such a Green New Deal, woven into the economic stimulus package, would provide enormous government investment in clean technology and a new energy infrastructure that would accelerate energy efficiency, foster energy security, create millions of jobs and jumpstart a sustainable low-carbon economy.

However, even believers in the magic bullet will acknowledge that there the complexities of the issues and domestic and international political obstacles will require smart solutions and enormous political will. The investments needed for a new sustainable energy infrastructure and the cost to mitigate and adapt to climate change will be vast. Who will provide these investments, who will allocate the funds, and how will the cost between North and South be shared? All elements to a sustainable energy mix pose new questions: renewable energies will not suffice for energy security; bioenergy could impact food security; nuclear energy could trigger the proliferation of nuclear weapons; and clean coal will require significant increases in efficiency. How can effective governance structures be built to deal with climate and energy policy? How can trade rules and policies aimed at tackling climate change be reconciled?

This Occasional Paper focuses on how the multilateral trading system can favor or impede the pursuit of climate change goals. It looks at barriers to technology transfer such as intellectual property rights and analyzes the interests of development and industrialized countries behind them. Meyer-Ohlendorf and Gerstetter explore the tensions behind border adjustment measures between “green protectionism” and fears of “carbon leakage.” The authors give practicable policy options to foster technology transfer in a highly complex policy field.

The Friedrich-Ebert-Stiftung will contribute to the international dialogue on climate and energy policy with a series of conferences and publications. Bringing together policy makers and experts from emerging and industrial countries as well as multilateral institutions, we want to explore the potential for a just global energy order and a sustainable energy path.

Marc Saxer
Co-Coordinator,
Dialogue on Globalization

2. Executive Summary

To address climate change successfully, to provide all people with energy and to reduce dependency on fossil fuels substantially, developed and developing countries will have to restructure their economies to low carbon economies. For this profound restructuring, major investments in low carbon technology in the range of US\$9.3 trillion between 2010 and 2030 will be needed, in addition to significant changes in life styles. This process of technological innovation or dissemination of low carbon technologies will largely depend on international trade and investment of private actors and much less on state activities, although the financial crisis might herald a stronger role of state actors in the area of technology transfer. As a consequence, the multilateral trading system can favour the pursuit of climate change goals but it can also impede them.

On the flip side, various developed countries have voiced concerns that lax commitments of major developing countries, notably China and India, will give these countries a competitive advantage and would have a negative impact on the environment, because reallocation to emission havens and changes in market shares would lead to increases in overall global emissions, i.e. “carbon leakage”. However, climate change policies have been in place for some time now, and there is no evidence that the past and existing policies have caused carbon leakage, despite routinely voiced concerns from various stakeholders. While the past might not support the assumption of leakage, this picture could change for specific industries in the future, in particular when certain measures, such as emission trading, overcome their initial learning phases and become more effective in attaining reduction targets.

Against this backdrop, various trade-related measures are of particular relevance for climate change and development, e.g. liberalisation of trade in environmental goods and services, standards and labels, subsidies for fossil fuels technology transfer and border adjustment measures:

- Liberalisation in trade with environmental goods and services (EGS) holds significant potential to promote innovation and deployment of EGS. The WTO has dealt with these issues for years now, but negotiations have stalled. It appears that a workable compromise should be based on a clear definition of EGS. A list approach, including a broad range of products, including areas where developing countries may compete, may be preferable.
- Standards and labels are another trade-related measure of great relevance for protecting the environment at relatively low costs. To help protect the environment and to avoid distortion in international trade, standards and labels should be harmonized internationally as far as possible. While simplification and coherence are objectives themselves, it should be noted that the complexity of details is great and that harmonisation should not lead to lowering the environmental ambitions of existing standards and labels.

- Subsidies for fossil fuels are rampant in many countries, though they have various negative effects – particularly on the environment, but also on development. Although reforming these subsidies is a great challenge in any country, the potential benefits of such reforms are great and warrant a strong effort. International discussions and fora, notably the WTO, should support more strongly national efforts in reforming fossil fuels. It is unfortunate that the WTO has only a limited mandate to address subsidies for fossil fuels; a wider mandate allowing the WTO to deal with non-specific, existing environmentally harmful subsidies should be considered.
- Transfer of technologies is another important element in building a global low carbon economy, even though current levels are insufficient. For this purpose, the existing room for flexibilities in the WTO TRIPS Agreement should be fully exploited. Moreover, states should refrain from bringing complaints against other WTO Members for adopting climate-friendly measures, in IPR law or in other areas of law.
- Border adjustment measures (BAM) can take different forms, such as taxes or charges, an obligation to purchase emission allowances upon importation, quotas or technical standards or regulations. Although the impact of different design options will differ, BAM are a last resort and should only be seriously considered when all other means have been exhausted. The potential disadvantages of BAM seem to outweigh possible benefits.

3 Introduction

The Intergovernmental Panel on Climate Change (IPCC) has shown that an increase of Earth's average temperature by more than 2°C above pre-industrial temperature would have severe consequences for the environment, economies and societies alike. The IPCC has also shown that developing countries are likely among those suffering the most from climate change.¹ By 2020, for example, between 75 and 250 million people in African are projected to be exposed to increased water stress and yields from rain-fed agriculture could be reduced by up to 50%, which together would further adversely affect food security and exacerbate malnutrition in this region. Rising sea levels will threaten low-lying coastlines in many parts of the world, but developing countries are expected to be particularly affected, because of their low adaptation capacities and large concentrations of populations in these coastal regions, such as the Ganges or Nile delta.

A scientific consensus is emerging that substantial cuts in greenhouse gas emissions in the range of 50% by 2050 (compared to 1990) will be required to keep the increase in average temperature below the 2°C threshold. A business as usual scenario, however, would put the world on a track of a 6°C temperature increase. Although the ongoing international negotiations on climate change centre largely on which countries will reduce their emission in what timeframe, agreement is emerging that it is primarily the responsibility of developed countries to reduce their greenhouse gas emissions first (in a range of 25–40% by 2020 and 80–95% by 2050), while – in line with the principle of common but differentiated responsibility – developing countries take specific policy commitments. At the same time, it is clear that required global emission reductions cannot be achieved in developed countries alone. Developing countries will have to reduce emissions as well, especially China, India and some in the Middle East, as they are projected to account for 75% of the global increase in greenhouse gas emission under a business as usual scenario. The International Energy Agency (IEA) assumes that the 2°C target is unlikely to be attained even if all OECD countries reduce their emissions to zero by 2030.

Developed *and* developing countries will have to build a low carbon economy. An additional energy investment of US\$9.3 trillion between 2010 and 2030 will be needed globally to limit warming to two degrees.

In consequence, developed *and* developing countries will have to build a low carbon economy, at least in the long run. This will require efforts at various levels, including substantive changes in life-style, in particular in industrial countries. No less important, and the focus of this paper, is, however, major investment in low carbon technology. The IEA estimates an additional energy investment of US\$9.3 trillion between 2010 and 2030 will be needed globally to limit warming to two degrees.² Given the technological capacity of developing countries compared to those of developed countries, the requisite technology will mainly come from these countries, despite growing technological capacities of some emerging

1 IPCC 2007 Synthesis Report http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

2 New Energy Realities – WEO Calls for Global Energy Revolution Despite Economic Crisis, http://www.iea.org/Textbase/press/pressdetail.asp?PRESS_REL_ID=275

economies, notably Brazil, China and India. This process of technological innovation, or the dissemination of low carbon technologies, will largely depend on international trade and investment of private actors as well as on state activities, despite the fact that the term “technology transfer” implies a major role of governments. Against the backdrop of the current global economic and financial crisis, it remains to be seen what effect current economic programmes to alleviate the crisis will have on foreign direct investment and the fostering of clean energy technologies, for example. In any event, the multilateral trading system can favour the pursuit of climate change goals, but it can also impede them.

As the flip side of the same coin, various developed countries, in particular the US but increasingly EU countries, have voiced concerns that lax commitments of major developing countries, notably China and India, will give these countries a competitive advantage economically, because industries in these countries do not face costs from stringent climate change policies. It is often contended that such a free ride would unfairly boost the competitiveness of developing countries and divert trade flows to the disadvantage of climate friendly countries. In addition, it is alleged that differences in national climate change policies not only have a negative impact on competitiveness, but also on the environment, because reallocation to emission havens and changes in market shares would lead to increases in overall global emissions, i.e. “carbon leakage”. To offset the alleged distortion of competition and carbon leakage, some developed countries have called for measures equalising unfair advantages of free riding countries through trade related measures, such as border tax adjustments or subsidies.

Against this background, the following policy paper summaries some of the most relevant issues at the inter-linkage of trade and climate change and makes recommendations for the political debate. In its initial chapter, the paper presents an overview of the most relevant issues, i.e. liberalisation of trade in environmental goods and services, technical standards and labelling, international investment protection treaties and subsidies for fossil fuels. The paper then analyses the role of and potential for technology transfer, followed by a discussion in the next chapter of the potential of border adjustment measures to address competitiveness concerns and carbon leakage – discussions of which in the context of trade and climate change are particularly contentious in developed countries. Finally, the paper draws conclusion and puts forward recommendations to strengthen synergies between trade and climate change policies.

The dissemination of low carbon technologies will largely depend on international trade and investment.

4. Overview of the Trade and Climate Debate

The IEA has estimated that \$26 trillion in investment in the energy sector are needed between 2005 and 2030 under the business as usual scenario, but another \$4.1 trillion would be required to limit temperature increase to 3°C (0.2% of global GDP), or additional \$9.3 trillion (0.6% of global GDP) to attain the 2°C target.³ It is widely agreed that international trade will play a crucial role in making these huge investments possible. At the same time, there are various issues that potentially will have a negative impact on trade and investments in clean technologies, such as:

- lack of clear guidance on future energy policy and lack of fiscal incentives for clean energy production,
- weak environmental regulation and enforcement,
- tariffs on environmental goods and services (EGS)
- non-tariff barriers on trade in EGS, such as standards and labels,
- weak and fragmented protection of investments,
- subsidies for conventional energy sources, and a domestic financial sector that has little experience with new technologies.⁴

While the first three issues – energy policies, fiscal incentives and environmental regulation – might have a particularly strong impact on investments in clean technologies, they are not of direct importance for international trade and, therefore, beyond the scope of this paper. The remaining issues – tariffs, non-tariff barriers, investment protection and subsidies – will be addressed in this section.

4.1 Liberalization of Trade in Low-Carbon Goods and Services

Wide use of low carbon technologies is key to sustainable development, and there is broad consensus that trade will play a major role in disseminating low carbon technologies widely. It is expected that advanced know-how and environmental technologies will become more readily available through liberalised trade. It is also presumed that liberalised trade is a particularly potent driver for technological innovation. In response, WTO Members adopted the Doha declaration in 2001, which calls for a reduction/elimination of tariffs and non-tariff barriers on environmental goods and services (EGS).⁵ The rationale of the EGS discussion is

³ EA, World Energy Outlook 2008, Executive Summary, p. 4, 5.

⁴ Cosby et al., 2008, p. 5.

⁵ See para. 31 (iii), available online at http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm

that high tariffs and non-tariff measures on environmentally-sound technologies are a major barrier to the wider use of such technologies.⁶ The World Bank estimates that the complete elimination of tariffs and non-tariff barriers, such as quota, would lead to an average increase of trade in clean coal technology, wind/solar power generation and efficient lighting technology by 13,5% compared to the current level, with variations across technologies and countries. Eliminating tariffs alone would raise trade levels by an average 7% from current levels.⁷ Moreover, there is evidence of a positive relationship between levels of trade in environmental goods and pollution levels: countries with higher levels of trade in environmental goods have less pollution or consume energy more efficiently.⁸

Despite the potential of trade liberalisation for a wider use of low carbon technologies, the Doha negotiations have been stalled over various issues, such as subsidies for agricultural products or free access to markets of developing countries. Concerning EGS, the negotiations have focused so far on environmental goods, rather than on environmental services, and rather more on tariff cuts, than on non-tariff measures (such as energy efficiency-standards). Among other things, the negotiations have been characterised by disagreement between developing and developed countries. Many developing countries fear that reduced tariffs will be to the benefit of developed countries only, the main producers of environmentally friendly technologies. Only a few developing countries, such as Brazil, China and Mexico, are important producers of clean energy technologies⁹, while developing countries on the whole are net importers of environmental goods.¹⁰

Indeed, the export of environmental goods is highly dominated by the industrialised countries with a market share of 79.9% – only 20.1% for developing countries.¹¹ Depending on the definition of environmental goods, this market power might even extend to areas without environmental relevance, when dual-use goods are allowed to profit from trade liberalisation irrespective of their concrete use. This would aggravate existing trade imbalances even further. The following figure provides more detail.¹²

Reflecting the difference in market shares, it is not surprising that tariffs maintained by developing and mid-income countries on climate-friendly technologies are substantially higher than the rates applied by developed countries.¹³ And in the short term, liberalised trade in EGS is unlikely to increase market shares of developing countries. In consequence, developing countries are not likely to benefit from increased trade share in the near future, but rather from the reduction

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Many developing countries fear that reduced tariffs will be to the benefit of developed countries only.

6 See Brewer (2008), U.S. Climate Change Policy and International Trade Policy Intersections, Paper Prepared for a Seminar of the Center for Business and Public Policy Georgetown University – February 12, 2008, online at <http://www.usclimatechange.com/downloads.php>, for an overview of current tariffs on important technologies and goods, p.11-12

7 Worldbank (2008), p. 53.

8 Bora/The (2004), slide 23.

9 ICTSD (2008), 4.

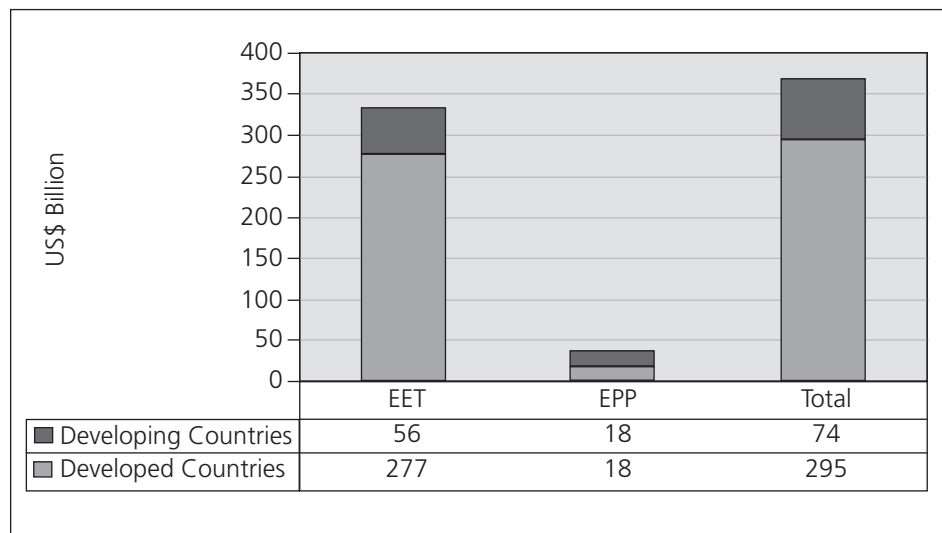
10 Worldbank (2008), p. 85.

11 ICTSD 2007, page 33: While the former includes manufactured goods and materials directly used in the provision of environmental services, the latter includes “industrial and consumer goods not primarily used for environmental purposes but whose production, end-use and/or disposal have positive environmental characteristics relative to similar substitute goods” (Hamwey, 2005: 2)

12 The figure is taken from ICTSD 2007, p. 34.

13 Worldbank (2008), p. 80 and Appendix 6.

Environmental Goods and Services Exports to World 2003



Source: Hamwey, 2005.

of compliance costs with environmental regulations. A broadly defined list of EGS will, however, permit the inclusion of goods and services of export interest to developing countries, notably goods and services derived from sustainable agriculture and fisheries, sustainable forest management, biodiversity and sustainable tourism activities.¹⁴

The definition of Environmental goods and services (EGS) has been one of the most contentious issues.

Next to the issue of market share and potential benefits, the definition of EGS has been one of the most contentious issues. Environmental goods can be categorised in general terms as: (1) established environmental technologies (EET), or b) environmentally preferable products (EPP)¹⁵. The former category comprises products designed directly to address a specific environmental problem (p. ex. sewage treatment technology), whereas the second category consists of products that are more environmentally friendly than other products serving the same purpose, at the stages of production, consumption or disposal (p. ex. solar panels, biodegradable products). An exact and workable definition, however, has raised a long controversy in the WTO negotiations and beyond. Tariff negotiations in the WTO are based on the so called Harmonized Commodity and Description Coding System. Under this system, products are classified by numbered categories. In the context of the debate on EGS, this approach leads to problems, as EGS are not classified as a separate category. Therefore, negotiating tariff reductions for a certain category of products would imply lowering tariffs both for environmentally friendly products and their conventional counterparts as well as for products that may or may not be put to an environmentally friendly use. This is a step many countries do not want to take. They are eager to protect their markets through tariffs from imports from other competing countries. In particular, developing countries are concerned that a broad definition of EGS would open borders to imports of a wide range of products with dual-use potential, i.e. lowering or even eliminating tariffs in EGS could turn into a Trojan horse.

Developing countries are concerned that a broad definition of EGS would open borders to imports of a wide range of products with dual-use potential.

¹⁴ ICTSD 2007, page 110:

¹⁵ ICTSD 2007, page 33: While the former includes manufactured goods and materials directly used in the provision of environmental services, the latter includes “industrial and consumer goods not primarily used for environmental purposes but whose production, end-use and/or disposal have positive environmental characteristics relative to similar substitute goods” (Hamwey, 2005: 2)

In an effort to address these issues, some WTO members have made proposals to define EGS and to solve the problem of the dual-use of goods. In late 2007, the EU and the US tabled a list of 43 products that the World Bank has categorised as environmentally friendly. Other countries have suggested a definition of EGS on a project-by-project basis¹⁶, i.e. the classification of a product as EGS would depend on its intended end use as - for example – a component of a windmill or building insulation. Experts have added other proposals, such as a duty refund mechanism for goods actually put to an environmentally sound use.¹⁷ As of now, consensus is not in sight and indeed very difficult technical and political issues will have to be solved before reaching an agreement. It appears, however, that a workable compromise should be based on:

- the trade and environmental objectives of the Doha round, i.e. privileged treatment of EGS through broad trade liberalisation,
- the development objectives of the Doha round, i.e. developed countries should be ready to accept lower tariffs for imports from developing countries and should be prepared to agree to some type of protection of developing country markets in the short term,
- a clear definition of EGS. The project-based approach, in this context, seems to suffer from the inherent weakness that the end use of a product is difficult to define and difficult to control. A list approach, in contrast, runs the risk of resulting in too narrow a list of products (in particular with relation to dual-use goods) and thus not attaining maximum climate protection effects. A list approach, including a broad range of products, including areas where developing countries may compete, may thus be preferable.

4.2 Technical Standards and Labeling

Technical standards and labelling are another major issue at the interlinkage of trade and climate. Studies have shown that both instruments have a high potential to reduce energy consumption and, thereby, emissions. The main differences between standards and labels are essentially that the former sets a benchmark for the performance of a product, while the latter describes the characteristics of the product, enabling the consumer to make an informed choice when purchasing a product. Standards often set legally binding benchmarks for producers, while labels serve as a consumer information tool. An example for a technical standard could be related to the energy performance of maximum emission levels of certain technical equipment. The well known “Energy Star” is an example of an energy-related label which is awarded to products meeting certain energy-efficiency standards.

Current standards and labelling schemes within the OECD are generally credited with reducing total energy bills across the affected broad end-user sectors, e.g., the residential sector, by between 10 and 20 %. Savings for individual product

¹⁶ See the submission by India, An alternative approach for negotiations under paragraph 31 (III) of 3rd of June 2005, TN/TE/W/51

¹⁷ See Howse/Van Bork (2006). For other proposals see ICTSD (2008), 6,7.

types can be much higher, up to 70 % in the case of refrigerators in the United States (CLASP, 2007). The mandatory switch to compact fluorescent lighting in a handful of countries, for example, will eventually reduce more green house gases emissions than the entire current roster of CDM projects. Moreover, these kinds of emission reductions stand out as highly cost effective, with most having negative overall costs from a life-cycle perspective. Interestingly, ex-ante estimates of cost-effectiveness have generally under-estimated highly cost-effective energy savings from such measures.¹⁸

Countries can facilitate trade and apply efficiency standards and labelling regulations at the same time, if they apply certification and accreditation processes that are in line with ISO, and refrain from locally specific procedures.

Both instruments constitute – potentially – non-tariff barriers to trade. They are covered by WTO law, in particular the Agreement on Technical Barriers to Trade (TBT), which imposes certain limitations on (mandatory) technical standards and labelling requirements¹⁹, and the General Agreement on Tariffs and Trade (GATT), which requires non-discriminatory treatment among like products. In fact, efficiency standards and labels are reportedly the single largest cause of national notifications to the WTO under the TBT Agreement. While there are potential tensions between international trade law and national standard and label schemes, countries can facilitate trade and apply efficiency standards and labelling regulations at the same time, if they: (1.) apply certification and accreditation processes that are in line with broad recommendations issued by the ISO, and (2.) refrain from locally specific procedures. As a consequence, differences in energy performance test procedures, certification, accreditation and compliance regimes should be minimized, where they still exist. While simplification and coherence are agreed objectives themselves, it should be noted that the complexity of details is great and that harmonisation should not lead to lowering the environmental ambitions of existing energy performance standards and labels.

¹⁸ See for the entire paragraph: Waide/Bernasconi-Oswalder (2008), 2-4.

¹⁹ Waide/Bernasconi-Oswalder (2008), 4.

Technical Standards, Labelling and World Trade Law

As a fundamental principle, WTO law requires non-discriminatory treatment among like products, i.e. products have to be treated in the same manner as other “like” products. “Likeness” is defined in WTO jurisprudence by four criteria, namely: physical properties; end-use; tariff classification; and consumers’ tastes and habits. The competitive relation of products has been used as an additional, overarching criterion. While the first four criteria provide important legal guidance when determining the likeness of a product, it is noteworthy that the underlining case law is complex and that the “competitive relation of products” will be crucial when defining likeness, in particular because of the overarching objective of WTO law, which is trade liberalization.

To illustrate this case law, let us take the example of two refrigerators of the same size and energy performance, one of them produced in a plant with the latest abatement technologies in place, and the second one produced with no such technologies. The production of the second type of refrigerator evidently is much more harmful for the climate than the production of the first one. Both refrigerators have, however, the same physical properties, the same end-use (cooling) and come in the same category of WTO tariff classification. Both refrigerators will therefore probably be qualified as “like” products under WTO law and will have to be treated alike by WTO Members. This imposes serious limits on the regulatory measures that WTO Members can take. Therefore, standards stipulating that products may not be imported or only be imported under less favourable conditions when not complying with certain requirements concerning their climate-friendly production will contradict, *prima-facie*, WTO rules on non-discrimination. Such standards may still be justified under certain conditions, when instituted for the protection of clean air, because WTO law contains an exemption in favour of environmental measures.²⁰ Such an exemption is subject, however, to a number of conditions.”

The example of the two refrigerators demonstrates that environmental standards prescribing certain climate-friendly ways of production are problematic under WTO law. In response, WTO Members have reacted to the problem and given the WTO CTE a mandate for discussing the relationship between international environmental agreements (of which the UNFCCC and the Kyoto Protocol are examples) and WTO law.²¹ The aim is making sure that WTO law does not prevent governments from adopting environmental measures. No decision has been taken so far, however.

²⁰ The Appellate Body, the highest judicial body at the WTO, decided in one of its first cases, the US-Gasoline disputes, that clean air qualified as an “exhaustible natural resource” in the sense of Art. XX (g). Whether the climate at large would also fall under this clause, is less obvious, however.

²¹ The mandate is contained in paragraph 31 (ii) of the Doha Declaration.

4.3 International Investment Protection Treaties

International investment protection treaties can have an impact on investment decisions. In this context, a practically relevant question is whether certain climate-related rules may constitute a (partial) expropriation of the investor. Cosby has identified contradictory case law on the issue, with some courts ruling that a non-discriminatory measure of general application, taken in the public interest, does not amount to expropriation, while others adjudicating that such measure may constitute an expropriation, if it has a significant economic impact on the investor.²² Cosby, therefore, recommends including a clause in investment treaties whereby non-discriminatory regulatory action taken for public policy purposes will not be considered an expropriation. Such a clause would prevent investors from claiming compensation for alleged expropriation through a government's climate-related measure. It would therefore ensure that governments in countries receiving investments are not kept from taking pro-climate measures for fear of facing compensation claims from investors. Next to the question of de facto expropriation, fragmentation in the international investment protection regime can stifle investment in clean technologies. International investment protection treaties are enshrined by and large in bilateral investment treaties and regional free trade agreements (e.g. NAFTA). The combined number of such agreements is estimated at roughly 2500 globally.²³ These rules differ in scope and content, leading to a fragmented regime of global investment protection. Although this fragmentation can lead to legal uncertainties and stifle investment decisions, some basic regulatory principles tend to be enshrined in all investment treaties, such as: rules on non-discrimination between foreign and domestic and investors; a prohibition on expropriation; and rules on transparency.

Investment treaties have an ambiguous role: they may foster investment in climate-friendly technologies, but also may restrict governments' freedom to impose pro-climate requirements.

In sum, investment treaties therefore have an ambiguous role with regard to climate protection: On the one hand, they may foster investment in developing countries, including investment in climate-friendly technologies, by giving investors legal security. On the other hand, they may restrict governments' freedom to impose pro-climate requirements on investors. This negative effect may, however, be addressed by provisions in investment treaties allowing non-discriminatory regulatory action for public policy purposes.

4.4 Reduction of Fossil Fuel Subsidies

Cutting global subsidies for fossil fuels could reduce global GHG emissions by up to 6% per year.

Subsidies have significant impacts on the promotion of climate-friendly energy in both developed and developing countries. This is true both for subsidies granted for the use of climate-friendly technology and the reduction of subsidies for fossil sources of energy. For example, a recent UNEP study shows that cutting global subsidies for fossil fuels, which today make up the bulk of energy subsidies, could reduce global green house gases emissions by up to 6% per year.²⁴ UNEP estimates that around \$300 billion were spent in 2005 on consumer energy subsidies, the

²² Cosby et al 2008, p. 7.

²³ Cosby, 2008, p. 3.

²⁴ UNEP 2008, p. 11, 16, citing the OECD as a source.

bulk of it by non-OECD countries. Some developing countries governments spend more on energy subsidies than on education or health. The Indonesian government, for example, spends six times as much on energy subsidies as it does on agricultural investments.²⁵ However, there is significant pressure on governments both in developing and developed countries to maintain subsidies for fossil sources of energy. Consumer resistance to reducing such subsidies is particularly salient in developing countries where subsidies help to secure poor people's access to energy. For example, Yemen saw unrest and demonstrations in 2005, leaving about 20 people dead, when the government announced its plan to reduce subsidies to diesel.²⁶ Such public outcries are fuelled by the fact that poor households, in particular in developing countries, spend far larger shares of their income on energy than richer households – cutting energy subsidies and increased energy prices are therefore particularly problematic for the poor.²⁷

Cutting energy subsidies and increased energy prices are therefore particularly problematic for the poor.

Concerning trade effects, subsidies may make exports cheaper or make it harder for foreign products to compete. Given these distorting effects, WTO law regulates subsidies in the Agreement on Subsidies and Countervailing Measures (SCM Agreement) and the Agreement on Agriculture (AoA). These agreements, however, only limit the introduction of new subsidies, not the reduction of existing ones. Some have suggested that WTO law may be used to challenge national subsidies for fossil fuels as trade distorting.²⁸ Nonetheless, the fading out of subsidies for fossil sources of energy is currently a matter of domestic decision-making. Granting new subsidies, in turn, is more problematic from a WTO perspective. Whether or not a certain subsidy is prohibited depends to a large extent on the concrete design of a measure. It is likely, however, that measures which do not specifically target certain sectors or enterprises would be in compliance with the SCM Agreement. Subsidies in the agricultural sector granted for the purpose of fostering climate-friendly agricultural techniques (p. ex., to reduce emissions from cattle raising) would be allowed as so-called “green box” measures, as long as they affect trade only minimally.²⁹

Next to trade distortion, subsidies have other negative effects. They help already existing firms maintain their market shares and stifle the market access of new comers. They impede innovation and, in the case of subsidies for fossil fuels, significantly hamper the deployment of clean energy generation. Given the sheer volume of subsidies for fossil fuels, they absorb (scarce) resources from other policies that are vital for development, e.g. education, health, infrastructure or environmental protection. In sum, the reduction and ultimately the abolishment of subsidies for fossil fuels would be a key instrument for protecting the environment and liberalizing international trade, while enhancing long term development goals.

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25 Bradsher, Fuel subsidies overseas take a toll on the U.S., New York Times, 28th of July 2008, online at <http://www.nytimes.com/2008/07/28/business/worldbusiness/28subsidy.html?hp>

26 See Phillips, Cracks in the Yemeni System, online at <http://www.merip.org/mero/mero072805.html>

27 Heltberg 2003, p36.

28 See for example Benitah at <http://www.globalsubsidies.org/en/subsidy-watch/commentary/climate-change-is-there-place-a-wto-anti-subsidy-strategy>

29 See Chamowitz 2003, pp. 9–10.

In developing countries direct compensation for health or education costs should be considered.

Nonetheless, governments that plan the reduction of the subsidies are often subjected to significant domestic pressure from all camps and often have withdrawn the proposed reduction of subsidies before implementation. Reflecting this dilemma, there is no high level political discussion or forum where the reduction of energy subsidies is a central issue. Addressing this dilemma, governments and other relevant stakeholders should explore ways to reduce and abolish subsidies for fossil fuels. This would likely have to involve offering some compensation for increased energy prices. In developed countries, this may include such measures as reducing income taxes or lowering contributions to social security. In developing countries, these measures also should be considered, provided a functioning tax and welfare system is in place; if not, direct compensation for health or education costs could be another possibility.

Obviously, subsidy reform is a huge challenge in any country, particularly in developing countries, which sometimes suffer from close relations between governments and energy providers, as well as limited public participation and corruption. Regardless of the size of the challenge, the potential benefits of such reforms are great and warrant a strong effort. International discussions and fora should support more strongly national efforts in reforming fossil fuel subsidies. These international efforts could provide opportunities for additional fora and could play an important role when addressing deeply entrenched interests of specific domestic players.

5 Technology Transfer: Current Discussion, Legal Framework and Practices

The transfer of climate-friendly technologies is a major sticking point in the current UNFCCC negotiations. While all parties recognise, in principle, that wide dissemination of climate-friendly technologies is key for effectively tackling climate change, the details of implementation are disputed. For developing countries, a satisfactory consensus on technology transfer is one of the conditions for the conclusion of a post-2012 climate agreement, which would take the place of the current Kyoto agreement covering the period until 2012. Many developed countries that would provide the funding for increased levels of technology transfer wish to see substantial commitments by developing countries to tackle climate change in return. Observers from developing countries and the NGO community often believe that current levels of technology transfer – not only through the UNFCCC multi-lateral mechanisms, but in general – are insufficient. They are critical of what they call “green protectionism” by developed countries. At the same time, developed countries and their industries have a legitimate interest in maintaining profit margins and, thus, incentives for innovation.

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A great range of activities under the UNFCCC to promote the transfer of technologies have been launched in the last years, more recently under the umbrella of the Expert Group on Technology Transfer (EGTT). The EGTT is mandated to develop a strategy paper for the long-term perspective beyond 2012, to facilitate the development, deployment, diffusion and transfer of technologies under the Convention. The last Conference of the UNFCCC Parties in Poland agreed on the so called Poznan strategic programme on technology transfer, which is a further step towards scaling up the level of investment in technology transfer, in order to help developing countries address their needs for environmentally sound technologies.³⁰ Against, this backdrop, this chapter explains, in brief, the functioning of technology transfer and discusses barriers to technology transfer.

5.1 Technology Transfer – How it Works

The IPCC defines technology transfer as

“a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations (NGOs) and research/education institutions. ... “[T]ransfer” encompasses diffusion of technologies and technology cooperation across and within countries.”³¹

What becomes clear in this definition is that technology transfer is not only about the physical movement of technology from one place to another, but also about passing on knowledge and experiences to other regions. Thus, it is closely related

³⁰ Decision of COP 14: http://unfccc.int/files/meetings/cop_14/application/pdf/cp_tt.pdf

³¹ IPCC 2000, p. 3,

to capacity-building. Some definitions not only include the actual cross-border transfer of technology, but also learning how to use a technology, adapting technology to local needs and diffusion within the receiving country.³² The IPCC and other authors have pointed out that major developing countries such as Brazil and China are leading in the development of certain climate-friendly technologies. Technology transfer should and also does³³ take place between developing countries. Nonetheless, developed countries are still leaders in climate friendly technology and the UNFCCC obliges only developed countries to engage in technology transfer. In this study, therefore, we will focus mainly on technology transfer from developed to developing countries.

Technology Transfer: International Legal Framework

The climate agreements contain the following norms on technology transfer:

- In the UNFCCC, the most relevant norms on technology transfer are Art. 4.3, 4.5 and 4.7. Art. 4.3 and 4.5 of the UNFCCC oblige developed countries transfer technology to control, reduce or prevent GHG emissions. Art. 4.7 reinforces these obligations by stating that the extent to which developing parties comply with their obligations under the Convention depends on the fulfilment of developed countries' technology transfer obligations. Moreover, Art. 11 UNFCCC establishes a financial mechanism, which serves, inter alia, for the implementation of the technology transfer obligation (see below for a description of its functioning in practice).
- In the Kyoto Protocol, Art. 10 lit c contains an obligation for all parties to develop and transfer environmentally sound technologies.
- In the Montreal Protocol, Art. 10 and 10a lay down obligations on technology transfer to certain developing countries that have low emission rates of substances depleting the ozone layer. To this end, inter alia, a multilateral mechanism was established.

In general terms, technology transfer can be market-based, occur in the framework of publicly funded bilateral or multilateral programs, or happen in the form of private-public partnerships.³⁴ Market-based technology transfer mostly takes place in the form of foreign direct investment (FDI) or licensing.

A OECD 2008 study³⁵ on trends of innovation and technology transfer concerning climate-related technologies³⁶ finds that rates of innovation have constantly gone up since the adoption of the Kyoto Protocol, while the same is not the case for rates of technology transfer. This is illustrated by the following two figures from the study:

32 WTO Working Group on Trade and Transfer of Technology, A taxonomy of country experiences on international technology transfers, WT/WGTT/W/3, 11th of November 2002

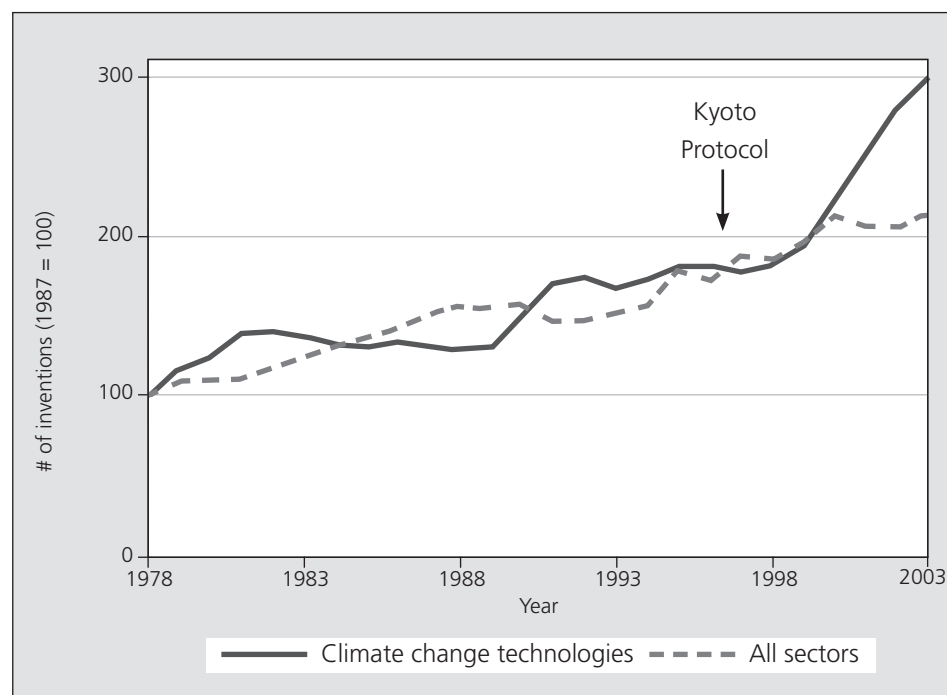
33 See for some examples Brewer (2008), Technology and Climate Change – International Flows, Barriers and Frameworks, Presentation at a Brookings Institution Conference, June 9, 2008, online at <http://www.usclimatechange.com/downloads.php>

34 See Brewer (2008), pp. 4–5.

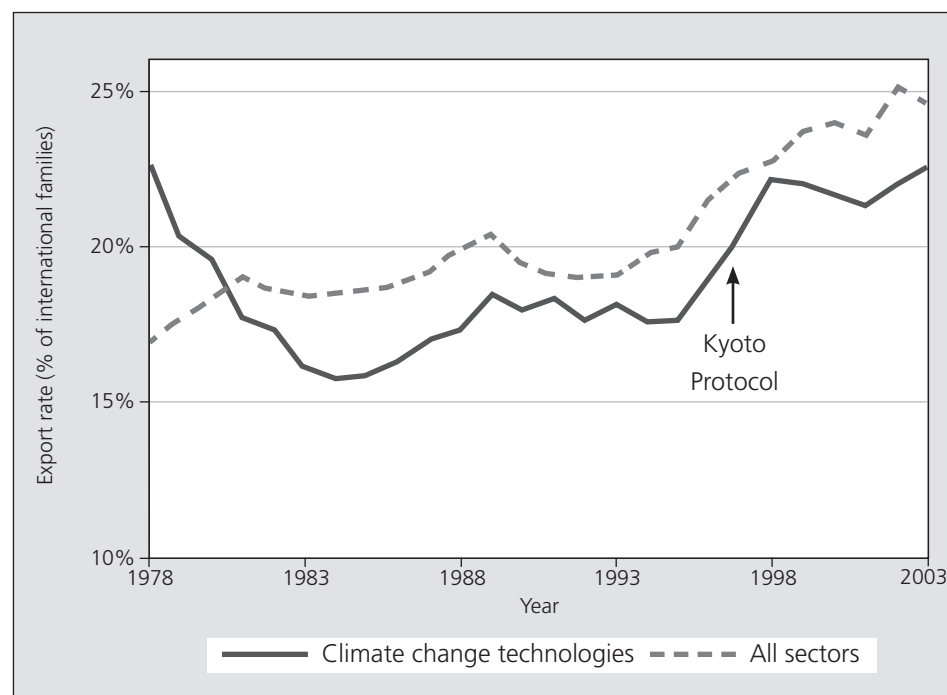
35 Dechezleprêtre et al (2008).

36 The study is based on the analysis of the number of patent applications concerning 13 different classes of climate mitigation technology between 1978 and 2003.

Innovation trend in climate technologies compared to all sectors



Percentage of international patent families, 1978–2003³⁷



Source for both graphics: Dechezleprêtre et al (2008).

³⁷ The number of international patents families, i.e. patents that are registered in more than one country may be used as an indicator of technology transfer, because inventors intending to enter foreign markets usually seek patent protection in these markets, see Dechezleprêtre et al (2008), p. 22.

In addition, the study concludes that while the international transfer of technology did not significantly increase between 1978–2003, three quarters of the technology transfer is between developed countries and less than a fifth is between developed countries and developing countries.³⁸ This suggests that efforts additional to existing initiatives are needed to boost technology transfer.³⁹

UNFCCC/Kyoto Framework

In the UNFCCC/Kyoto framework, there are currently two main mechanisms for technology transfer: the Special Climate Change Fund (SCCF) and the Clean Development Mechanism (CDM).

- The SCCF is administered by the Global Environmental Facility. By January 2008, it had received commitments by 13 developed countries amounting to \$90 million, only about \$18 million of which are, however destined, directly for technology transfer.⁴⁰ Several development agencies administer the implementation of technology transfer programs, mainly UNEP and IBRD.

Assessments of the present practice of technology transfers financed by the Special Climate Change Fund are scarce.⁴¹ So far, no comprehensive overview, much less an assessment, of the technology transfer projects financed from the UNFCCC is available⁴². Therefore, substantial conclusions on the working of multilateral approaches towards technology transfer under the UNFCCC are not possible yet.

- The CDM, in contrast, does not serve the primary purpose of technology transfer. Its objectives, according to Art. 12 of the Protocol, are: to assist developing countries in achieving sustainable development; to contribute to emission reductions; and to make it easier for developed countries to comply with their quantified emission limitation and reduction commitments. Nonetheless, the CDM has evolved into a mechanism for the transfer of climate-friendly technology, because, in the framework of projects carried out by developed countries in developing nations, technology from developed countries is frequently used.⁴³ Recent studies investigating technology transfer in the framework of CDM projects conclude that technology transfer took place in almost half of the CDM projects, in particular in hydropower, land fill and wind energy projects and

38 Dechezleprêtre et al (2008), p. 23.

39 A more extended list of US projects can be found in Deal (2007), pp. 28.

40 GEF, Status Report on the Climate Change Funds as of March 4, 20008, online at http://www.gefweb.org/uploadedFiles/Documents/LDCFSCCF_Council_Documents/LDCFSCCF4_April_2008/LDCF.SCCF.4.Inf.2%20Trustee%20Status%20Report%2003.21.08.pdf

41 The two relevant bodies within the UNFCCC framework, the Subsidiary Body for Implementation and the Expert Group on Technology Transfer, have requested studies to assess the current practice of technology transfer and develop indicators for future assessment, e.g. in <http://unfccc.int/resource/docs/2008/sbsta/eng/inf02.pdf>

42 GEF publications list some projects concerning the transfer and diffusion of environmentally friendly technologies – e.g. supporting the production of low energy boilers in China, the use of solar water heaters in Morocco and the transfer of wind energy technology to Mexico – but it remains unclear, if they are funded through the UNFCCC. The databank of the GEF at <http://gefonline.org/home.cfm> only lists adaptation projects so far, when SCCF is inserted as source of funding.

43 It should be noted, that CDM projects have a variety of funding models. They are thus not necessarily paid from public funds.

end-of-pipe destruction of non-CO₂ greenhouse gases.⁴⁴ The major share of the technology comes from EU countries. Thus, the CDM seems to be a much more successful model for inducing technology transfer than the fund created for this purpose. This may well have to do with the fact that developed countries have some advantages of their own by engaging in CDM projects, while the advantages from their perspective may be less obvious under the auspices of the Special Climate Change Fund. Their contributions to the Special Climate Change Fund do not give them any distinctive advantage other than fulfilling their commitments under the UNFCCC/Kyoto. Investing in CDM projects, in contrast, is also a support for relevant domestic industries and allows developed countries to contribute to their emission reduction obligations.

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Montreal Protocol

The technology transfer mechanism under the Montreal Protocol has earned good marks from observers.⁴⁵ This may in part be due to the fact that the Montreal Protocol is generally considered to be one of *the*, if not *the*, most successful multilateral environmental agreement ever. The Protocol's multilateral system, the financing mechanism for technology transfer, has received around \$2.3 billion between 1994 and 2008 and spent them through programs run by UNDP, UNEP, UNIDO and the World Bank, as well as bilaterally.⁴⁶

The Montreal Protocol is generally considered to be one of the most successful multilateral environmental agreement ever.

Other Multilateral and Bilateral Mechanisms

Apart from the international climate agreements, other multilateral frameworks have been created to enhance technology transfer in the field of climate-friendly technology.

- In July 2008, the World Bank decided to create the Climate Investment Funds.⁴⁷ The relevant fund for financing technology transfer is the Clean Technology Fund. The use of the fund is guided by UNFCCC principles.⁴⁸ As of September 2008, ten developed countries, including Germany and the US, had pledged \$6.1 billion for the Climate Investment Funds in general. How much of that will be used for technology transfer is unclear as of now.⁴⁹ As critics have pointed out, investing in climate funds has not kept the World Bank from financing large-scale carbon-intensive power projects elsewhere. Criticism is also leveled against these funds, because the process of developing them – in line with normal World Bank procedures – did not include representatives from developing countries or civil society. Moreover, NGO critics point out that money from these funds will come – at least partially – in the form of credits and loans, i.e.

Investing in climate funds has not kept the World Bank from financing large-scale carbon-intensive power projects elsewhere.

44 De Coninck/Haake/van der Linden (2007) investigate the 63 CDM projects that had been registered by 1st of January 2006 and found that technology transfer took place in almost 50% of the cases. Dechezleprêtre/Glachant/Ménière (2007) investigate 644 CDM projects registered by 1st of January 2007 and find technology transfer to take place in 44% of the projects, which, however, account for 84% of the annual emission reductions.

45 See in particular the case studies in Andersen et al.

46 Figures according to Andersen et al., p. 31-33.

47 See <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCC/0,,contentMDK:21713769~menuPK:4860081~pagePK:210058~piPK:210062~theSitePK:407864,00.html>

48 See the description of the fund at http://siteresources.worldbank.org/INTCC/Resources/Clean_Technology_Fund_paper_June_9_final.pdf

49 See summary of the pledging meeting in September at http://siteresources.worldbank.org/INTCC/Resources/Summary_of_the_CIF_Pledging_Meeting.pdf

developing countries ultimately pay for the projects conducted in the framework of such funds.⁵⁰ Therefore, the World Bank funds cannot be considered a form of fulfillment of developed countries' UNFCCC/Kyoto obligations.

- The Asia-Pacific Partnership on Clean Development and Climate is a different kind of multilateral initiative. It was launched during a ministerial meeting in 2006. Australia, China, India, Japan, Republic of Korea and the United States make up the membership. Its aim is the diffusion of climate-friendly technologies in different sectors, through cooperation between governments and the private sector. While some of the projects are geared towards sharing knowledge and capacity-building, others involve the building of infrastructure for more climate-friendly production in partner countries.⁵¹

Many developed countries are involved in technology transfer projects in bilateral settings. They either have specific programs for technology transfer in place (such as the US-American Climate Technology Partnership) or provide funding for such purposes in the framework of their official development assistance (ODA) mechanisms. The overall flow of funds through such projects, however, is difficult to measure, as statistics on ODA do not contain technology transfer destined for improving the climate balance in developing countries as a separate category. The UNFCCC technology transfer website provides an overview of many projects.⁵² Although the overall size of technology transfer in the climate sector is difficult to measure, it appears that technology transfer makes up only a small share of official development aid. Categories which may include the transfer of technology – such as transport, environment and support for certain production sectors – only cover about \$15 billion of the overall amount. Assuming that only a small share these \$15 billion is actually dedicated to the transfer of climate-friendly technology, it is a fair guess that these flows are minimal.

5.2 Barriers to Technology Transfer: Perspective of a Developing Country

What are the reasons for the low levels of technology transfer? Many factors are at play simultaneously. Obviously, financial constraints play a crucial role. Moreover, there are some factors which generally favor investment, such as stable political and legal conditions⁵³. Barriers specific to technology transfer include:

- A lack of knowledge or training may lead to a lack of awareness of the best available technologies.⁵⁴ Further, technology capabilities in the country of destination may have opposite effects. While a country with more advanced tech-

50 See Sabina Voogd, Oxfam, Technology Transfer and Climate Change: Options for a Long term Policy Making, presentation during the Consortium for Trade and Development (CENTAD) side event during the 28th session of the UNFCCC special bodies, June 2008, online at http://unfccc.meta-fusion.com/kongresse/SB28/templ/ply_page.php?id_kongresssession=1229&player_mode=isdn_real#<?>

51 See the project descriptions at <http://asiapacificpartnership.org/CleanerfossilenergyProjects.htm#CFE%20Project%201>

52 <http://unfccc.int/ttclear/jsp/Projects.jsp>

53 For an overview, see DEFRA (2007), p. 40

54 See WTO (2002), pp. 7/8

nological capacities obviously has a decreased need for technology transfer, a country with no technological capacities at all may not be in a position to take advantage of the transfer of the most complex technologies.⁵⁵

- Domestic regulation: A legal environment with strict and enforced environmental standards, as well as financial incentives for the use of climate-friendly technology, will trigger increased technology transfer.⁵⁶ Equally, the openness of an economy seems to make technology transfer more likely.
- Intellectual property rights often are considered to have a dual role as both incentives and obstacles to the transfer of technology.⁵⁷ However, observers complain about a lack of knowledge on the empirical effects of patents on climate-friendly technology.⁵⁸ At the legal level, the relationship between the WTO TRIPS Agreement and international climate agreement is an important aspect, discussed more in depth below.
- Technology transfer, at least in the framework of CDM projects, is more likely to occur when a subsidiary of a company from a developed country is involved.⁵⁹ This can be read as an expression of vested interests in developed countries to protect themselves against competition from developing countries in the climate-technology sector. Fears of such green protectionism have recently been voiced, for example, by the Chinese vice premier.⁶⁰
- Studies of CDM projects also show that technology transfer is more prevalent in some sectors rather than in others, depends on the domestic availability of certain technologies, and occurs more frequently in large-scale projects than in smaller ones.⁶¹
- Finally, one study also shows that export rates of patented technology vary among exporting countries, with Great Britain and Germany having particularly high export rates.⁶²

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5.3 Intellectual Property Rights – an Obstacle to Transfer of Technology?

In the context of transfer of technology, the role of intellectual property rights (IPR) is ambiguous. Theoretical work suggests that IPR may constitute both incentives and obstacles to technology transfer⁶³. On the one hand, developed country firms selling or using low carbon technologies in other countries want to protect their technologies against “bootlegging”. Intellectual property protection may thus entice innovation and foreign direct investment. On the other hand, “copying” relevant technologies may be a relatively cheap way, in particular for developing countries, to use climate-friendly technologies. Copying, of IPR protected technology is illegal, however, without the consent of the holder of IPR. Whoever violates another person’s IPR may face indemnification claims from the IPR holder. In consequence, there is a potential tension between the protection of IPR and the wide application of low carbon technologies. How to reconcile this tension has

55 Dechezleprêtre/Glachant/Ménière (2007)

56 See Andersen et al (2007), p. 12

57 ICTSD (2008a)

58 ICTSD (2008a)

59 Dechezleprêtre/Glachant/Ménière (2007)

60 See <http://www.cchina.gov.cn/en/NewsInfo.asp?NewsId=12890>

61 Dechezleprêtre/Glachant/Ménière (2007)

62 Dechezleprêtre et al (2008), p.26.

63 OECD (2008): [http://www.oilis.oecd.org/olis/2007doc.nsf/LinkTo/NT00005B06/\\$FILE/JT03239222.PDF](http://www.oilis.oecd.org/olis/2007doc.nsf/LinkTo/NT00005B06/$FILE/JT03239222.PDF)

Developing countries emphasize the negative role that IPR play in technology transfer, while developed countries have a keen interest to protect patents developed by their domestic industries.

been a long standing issue in international climate and trade negotiations as well as academic discussions. As a general rule, developing countries emphasize the negative role that IPR play in technology transfer, while developed countries have a keen interest to protect patents developed by their domestic industries.⁶⁴

While this ambiguous role of IPR is plausible in theory, it is more difficult to produce empirical evidence on the impact of IPR, in the case of particular patents, on the dissemination of low carbon technologies. As of now, there are only a few empirical studies on the number and significance of patents on climate-friendly technologies. One of the few empirical studies concludes that:⁶⁵

- stronger levels of patent protection are positively and significantly associated with the inflows of high-tech products to developing countries,
- stronger patent rights in developing countries appear to have the potential not only to stimulate international technology transfer, but also to provide incentives for foreign direct investment, and
- copyrights and trademark rights are less strongly associated with technology transfer than is the patent rights index.

Moreover, a 2008 OECD study concludes that patent protection for the most relevant climate-technologies (e.g. solar, geothermal and biomass technologies) is requested and registered only in a small number of developed countries, in particular the US, Germany, Japan, Austria and Spain.⁶⁶ This suggests that patent protection for such technologies is not often filed and registered in developing countries. These findings question the argument that existing patents inhibit the use of climate-friendly technology in developing countries as they rarely provide patent protection.

In this context, it should moreover be noted that many relevant low carbon technologies are no high-end innovations. Often, these technologies have been in use for some time and are many times not protected by a patent. Even where such patents exist, their actual impact depends on a number of factors, such as: the existence of viable and cost-effective substitutes or alternatives, the degree of competition, and the price at which the technology is sold.⁶⁷

Assuming for a moment nonetheless that patents are a significant barrier to a wider use of technology – similar to patents in the field of pharmaceutical drugs – the question is how governments, in particularly those from developing countries, may adopt policies to overcome the negative effects of IPR.

One first policy option would be to restrict the patentability of certain technologies. Most countries are, however, members of the WTO and, thus, are bound by the

64 See for example the presentations by Mandal and presentation during the Consortium for Trade and Development (CENTAD) side event during the 28th session of the UNFCCC special bodies, June 2008, online at http://unfccc.meta-fusion.com/kongresse/SB28/templ/ply_page.php?id_kongresssession=1229&player_mode=isdn_real#

65 OECD Trade Policy Working Paper No. 62, 2008 by Park and Lippoldt

66 The study used the EPO/OECD World Patent Statistical Database which includes data from 81 countries, see Dechezleprêtre et al (2008), p.25.

67 Khor (2008), Note on Access to Technology, IPR and Climate Change, Briefing Paper 1 for the Consortium for Trade and Development (CENTAD) side event during the 28th session of the UNFCCC special bodies, June 2008, online at http://unfccc.meta-fusion.com/kongresse/SB28/templ/ply_page.php?id_kongresssession=1229&player_mode=isdn_real#

obligations of the TRIPS Agreement. Art. 27 TRIPS mandates that “patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application”. A fully developed climate-friendly technology will normally fulfill these criteria of patentability. The TRIPS Agreement, on the one hand, and the UNFCCC/Kyoto Protocol, on the other, therefore, follow different rationales and have different objectives. Nonetheless, there is no essential conflict between them in a legal sense, as they apply to different subject matters.

Nonetheless, governments may wish to explore the flexibility of the TRIPS Agreement in order to solve problems associated with patented climate technology. First of all, Art. 66.2 TRIPS mandates that Members shall take measures to encourage the transfer of technology to least-developed country members. Apart from referring only to least-developed countries, this norm does not justify measures taken by developing countries. Moreover, it is hortatory in nature, containing no obligations on concrete steps to be taken by developed countries.

Article 8 TRIPS, in turn, sets forth that a Member may “adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of this Agreement.” Though one may argue that climate protection is a vital interest for many developing countries threatened by the effects of climate change, the second half of this clause, which stipulates that measures must be consistent with the TRIPS, seriously limits the leeway that developing members have in adopting measures to promote the transfer of technology.

More specifically, Art. 27.2 TRIPS allows WTO Members “to exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to ... avoid serious prejudice to the environment....” This clause cannot be invoked by itself to justify excluding certain climate-friendly technologies from patentability, as the objective of such government policies is precisely their use, whether commercial or not. Nonetheless, the clause shows once more that environmental concerns are considered an important concern in the TRIPS Agreement. This could, for example, help to interpret Art. 8 TRIPS in a climate-friendly way.

Altogether, the TRIPS norms do not easily justify excluding climate-friendly technologies from patentability. Nonetheless, it is an open question whether WTO Members would actually seek retaliatory action, if another Member did not fully protect IPR on climate-friendly technologies in its country. The political cost of such action in terms of legitimacy could be rather high.

A slightly different pathway for solving the IPR issue may be compulsory licensing. Compulsory licensing means that a government can issue a license for a certain patented technology without the consent of the holder of the patent.⁶⁸ According

The TRIPS Agreement, on the one hand, and the UNFCCC/Kyoto Protocol, on the other, follow different rationales and have different objectives.

⁶⁸ For example, the German patent office could, in order to promote the wider use of solar technology, give a German company the right to produce a technologically advanced, patented type of solar panels even though the patent holder has rejected licensing the technology to the company. The company could then use the technology and would have to pay an adequate financial remuneration to the patent holder

to Art. 31 of the GATT, WTO members are, in principle, allowed to incorporate rules on compulsory licensing into their national legal orders. Art. 31 of the GATT, however, also imposes certain limits on compulsory licensing. It stipulates that compulsory licensing shall occur “for the supply of the domestic market of the Member authorizing such use.” This clause bars developed countries, wishing to promote the export of certain technologies at favorable terms and unhindered by IPR, from issuing compulsory licenses for export purposes. A developing country member to the WTO could, in turn, issue a compulsory license for supplying its domestic market if the patented technology needed for this purpose was produced in the developing country itself already. This is often not the case in poor developing countries.

Intellectual Property Rights: The Case of Medical Drugs

A similar problem existed concerning patented medical drugs. As in the climate sector, producers of (patented) products are predominantly based in developed countries, while the drugs are needed in the developing world. Intellectual property rights bar producers in developing countries from simply copying existing pharmaceuticals and cheaply producing them for distribution among the population.

To solve this issue, WTO Members in 2001 adopted the Doha Declaration on the TRIPS Agreement and public health, which recognized this problem and gave the TRIPS Council a mandate for finding a solution.⁶⁹ In 2003, the General Council of the WTO established a rather complicated mechanism that developing and developed country members of the WTO may jointly use for exporting needed drugs to developing countries. Under this mechanism, a developing country can notify to the WTO that it wishes to import certain pharmaceuticals for domestic use. A developed country member wishing to support the developing country member can notify its intent to do so to the WTO. If it does so, its obligations from Art. 31 lit f TRIPS are waived. This means that the developed country can then issue a compulsory license for the drugs needed, even if they are destined for export to a developing country. The existence of this mechanism shows that the legal barriers created by TRIPS are not insurmountable where political will exists.

Nonetheless, the Doha pharmaceutical mechanism has not been very effective to this point. It was not until October 2007 that the first notification of a developing country wishing to import drugs under the mechanism was received.⁷⁰ This experience cast doubt on the suitability of a similar mechanism for the transfer of low carbon technology. If a similar mechanism was adopted, it would have to avoid a bureaucratic structure. Moreover, as the UNFCCC/Kyoto framework already contains a mechanism for cooperation between developed and developing countries – the clean development mechanism – it is questionable whether establishing new, and partially parallel, structures in the WTO is useful.

The Doha pharmaceutical mechanism has not been very effective to this point. This experience cast doubt on the suitability of a similar mechanism for the transfer of low carbon technology.

⁶⁹ Online at http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm

⁷⁰ The country was Rwanda which planned to import a drug manufactured by Canadian producers, see http://www.wto.org/english/news_e/news07_e/trips_health_notif_oct07_e.htm

6 Border Adjustment Measures: A Way to Address Competitiveness Concerns and Foster the Use of Climate-Friendly Technologies?

Since their emergence in the 1990's, climate change policies have been a contentious issue, mainly because of their alleged adverse impacts on international trade and the competitiveness of specific industries, in particular energy intensive industries.⁷¹ A frequently voiced concern is that states with stringent climate policies will place domestic industries at a disadvantage relative to competitors in states with less ambitious climate efforts. Not only could this affect the economic prospects of these industries, producing unfavourable consequences, including loss of jobs and a deteriorating trade balance, critics fear that it could also undermine the environmental effectiveness of underlying climate policies by causing "leakage" – a relocation of manufacturing capacities (and thus greenhouse gas emissions) to states with more relaxed environmental standards. For the EU, these concerns have become more pronounced with the so-called "climate and energy package" aimed at reducing the EU's greenhouse gas emissions by 20% below 1990 levels by 2020, regardless of any post-2012 international climate agreement that might be reached.

Not surprisingly, these fears have translated into the active consideration of measures to help avert such undesired effects. Although a variety of measures have been proposed, all of the most prominent suggestions involve some form of restriction on international trade, in the form of border adjustment measures (BAM). In the US, for example, several legislative bills, which embrace measures relevant to international trade, such as tariffs on products from countries with no or less stringent climate change policies, are under consideration in the U.S. Congress. The European Commission's 2008 climate and energy package states that "energy-intensive industries which are determined to be exposed to significant risk of carbon leakage could receive a higher amount of free allocation or an effective carbon equalisation system could be introduced with a view to putting EU and non-EU producers on a comparable footing". This package includes a scenario in which importers are required to purchase emission allowances. Although adopted in December 2008, it remains to be seen whether the EU will actually introduce such a requirement for importers.

Against this backdrop, it should be noted that border adjustment measures can take different forms, such as taxes or charges, an obligation to purchase emission allowances upon importation, quotas or technical standards, or regulations. While various BAMs may differ in their design, they all serve to equalise the costs arising from climate change policies.

⁷¹ Refer also to Mehling, Meyer-Ohlendorf, Czarnecki, 2008

The following section gives an overview of the political, economic and legal aspects of BAMs as a tax or charge and an obligation to purchase emission allowances. The section concludes that BAMs are probably a last resort and should only be considered if other measures fail.

6.1 Carbon Leakage: Has It Happened and/or Will It Happen?

Estimates on the potential extent of carbon leakage are extremely difficult to make and suffer from a range of uncertainties. It is particularly difficult to determine the extent to which potential losses in competitiveness experienced by European industries can be directly attributed to the impact of climate change policies, or to other factors such as exchange rates, labour costs, tax levels or infrastructure standards – which are generally far more influential than carbon prices in determining a company’s decisions on where to operate. It is particularly difficult to single out the effect of each factor on the investment decisions of companies. It is also challenging to estimate the contrary, i.e. to make calculations based on a scenario without climate change policies. In the case of aluminium, for example, no additional production capacities have been created in the EU over the last 15 years, although climate change politics had no impact on electricity prices in that period due to the industry’s long term electricity contracts.

European industries have not been relocated to countries with lower environmental standards.

Despite these uncertainties, recent studies suggest that European industries have not been relocated to countries with lower environmental standards, in response to increases in compliance costs:

- A recent IEA study finds that there has so far been no sign that the first phase of the EU Emissions Trading Scheme (EU ETS) has prompted carbon leakage. The report – which seeks to “demystify” the “noises” coming from sectors such as cement and steel – finds that the first phase of the EU ETS, from 2005 to 2007, had no significant impact on the industries studied. Analysis of the steel, cement, aluminium and refining sectors revealed no immediately evident change in trade flows and production patterns. The generous free allocation of allowances and the general boom in relevant product prices may explain the absence of any significant EU effects. However, “the future form of the EU ETS may change these findings for some heavy industries, as Europe has planned more ambitious emission reduction targets post-2012”.⁷²
- McKibbin and Wilcoxon found that the effect of BAM on import prices would be relatively small, that they would have little effect on EU import-competing industries, that they would reduce leakage, although the rate of leakage is very small anyhow, and that much of the emissions reductions that would occur would come about because the BAM would reduce the world’s GDP through its overall reduction of international trade.⁷³

⁷² Reinaud, 2008

⁷³ McKibbin, and Wilcoxon, 2008

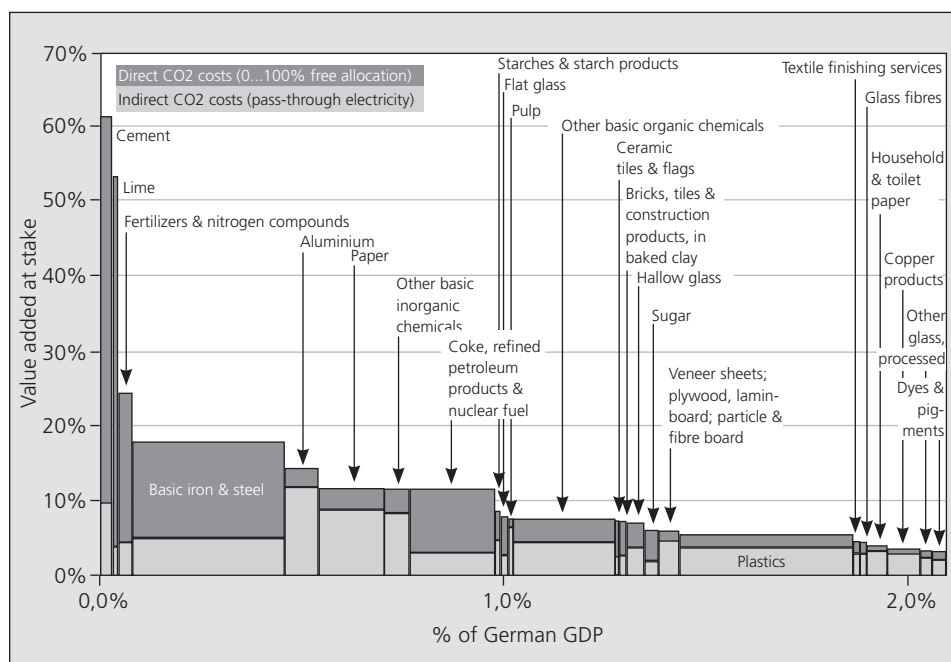
While the past has not produced strong evidence of carbon leakage, the projection of future relocation of business activities or shifts in market shares is less clear. Although it is highly unlikely that carbon leakage would wipe out entirely an effort to reduce emissions in an industry, leakage rates are expected to vary greatly from country to country and from sector to sector.⁷⁴ Energy intensive and highly traded industries are often assumed to experience leakage to a larger extent than in the past, partly because the revision of the European emission trading scheme will introduce additional auctioning of allowances and could start making emission trading what it is intended to be: an incentive to reduce emissions through giving emissions a price. In consequence, higher leakage rates would be expected in the steel and primary aluminium sectors than in the cement or electricity sectors – mainly because the latter are much less traded.⁷⁵ Resources for the Future finds that imposing a \$10 per ton charge for CO₂ in the United States (but not in other countries) would result in a 0.5 to 6 percent decline in domestic output from these industries.⁷⁶

Energy intensive and highly traded industries are often assumed to experience leakage to a larger extent than in the past.

However, the compromise on the European climate and energy package, agreed by the European Council at the recent December 2008 summit, excluded certain energy intensive industries from auctioning and rejected full auctioning of allowances by 2020. In addition, the share of industries potentially subject to leakage will be small in proportion to overall GDP, as indicated in the next two charts:⁷⁷

The European climate and energy package excluded energy intensive industries from auctioning. Moreover, the share of industries potentially subject to leakage will be small in proportion to overall GDP.

Value at stake relative to GDP – area in light grey represent indirect costs, areas in dark grey reflect direct costs



Sources: Statistical office, Öko-Institut

74 Reinaud, 2008

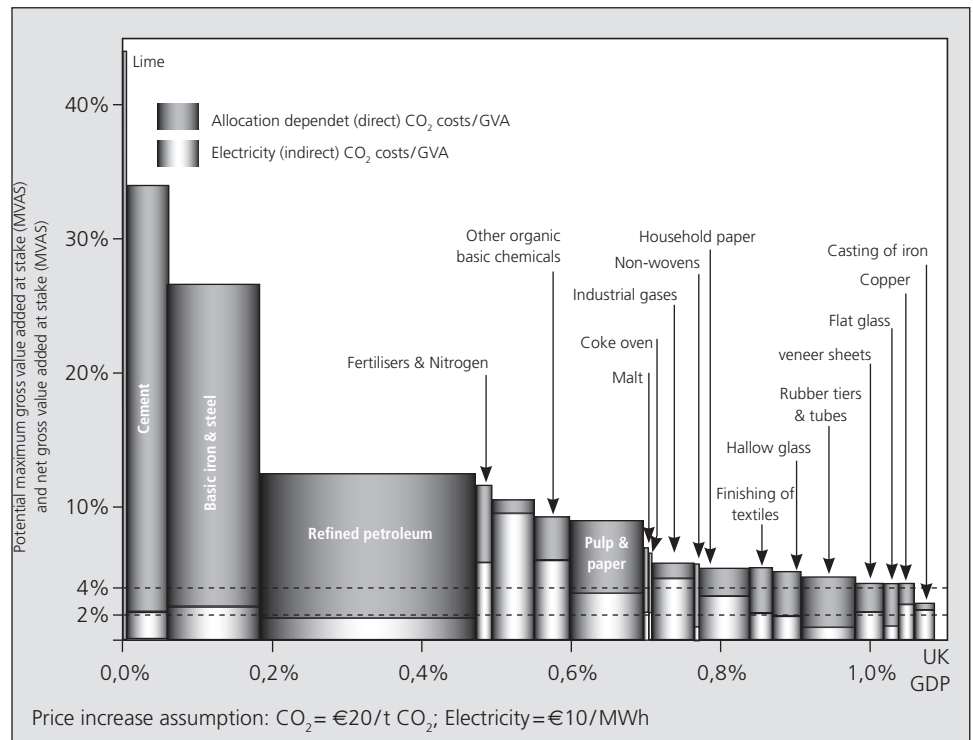
75 Reinaud, 2008

76 <http://www.wri.org/publication/bottom-line-international-trade>

77 Ökoinstitut Impacts of the EU Emissions Trading Scheme on the industrial competitiveness in Germany <http://www.umweltdaten.de/publikationen/fpdf-l/3625.pdf>

For the UK, Neuhoff has produced similar data, presented in the next chart:

CO₂ cost screen: UK industrial sectors potentially exposed under unilateral CO₂ pricing



Sources: Hourcade/Demailly/Neuhoff/Sato 2007

Although only small parts of Europe's economies will be affected by auctioning of emission allowances, carbon leakage has very strong political implications. The closure of plants with a few thousand workers laidoff causes wide public outrage. Moreover, the affected industries play an important economic role.

Although these figures show that only small parts of Europe's economies will be affected by auctioning of emission allowances, carbon leakage should not be treated as a minor issue that requires only limited political attention. Even with a relatively small overall economic impact, the issue has very strong political implications. The closure of plants with a few thousand workers laid-off causes wide public outrage; the reallocation of an entire industry, such as aluminium, would have an entirely different dimension. Moreover, the affected industries play an important economic role, particularly as suppliers of essential raw materials. At the same time, it must be emphasised that the reallocation of industries or loss of market shares depend on a great variety of factors – as outlined above. It should also be underlined that industries at risk of carbon leakage are set to receive emission allowances for free and that auctioning will be phased in over the next 12 years, i.e. by 2020. This makes reliable prediction on leakage rates difficult and gives room to the scare-mongering rhetoric of industries, which have a long track record of routinely exaggerating the impact of environmental policies on their operations. A close analysis of all factors relevant for carbon leakage is therefore required. This will take time.

6.2 Border Adjustment Measures – a Stick to Promote Ambitious Climate Change Policies?

Some have argued that BAM could be used to address carbon leakage and to create an incentive for laggard countries to join a new climate change regime. Proponents have contended that the EU's and other developed countries' economic power could translate into leverage in the climate change negotiations, i.e. the fear of losing access to EU markets could compel laggard countries to agree to an ambitious climate change agreement.

At the same time, however, many fear that a BAM would have negative political repercussions on both climate change and trade negotiations:

- Although it is difficult to predict how such a BAM would eventually play out in encouraging developing countries' participation in mitigation action, it is quite possible that many developing countries would see a BAM as proof that climate change policies are in fact a protectionist agenda sought by industrialised countries. This perception – valid or not – is particularly likely because BAMs are promoted by the US, the world's largest per-capita emitter of Green house gases. BAMs appear to prove the longstanding suspicion of green protectionism.
- The WTO is undergoing a difficult period, and its legitimacy and effectiveness are under scrutiny. For this reason, the WTO should not be forced to address yet another contentious issue, not to mention be faced with trade wars between major trading countries. Overburdening trade negotiations might not only adversely impact trade negotiations, but also climate change negotiations, whose success will depend partly on the creation of effective channels for technology transfer.
- BAMs could undermine the credibility of Europe's climate change policies and the value of market-based instruments: Climate changes policies are largely viewed as a driver of innovation and competitiveness. BAMs, in turn, imply that climate change policies are in fact a burden for industries.

Indeed, it would seem awkward if the EU accepted a new climate change regime (ideally next year) on the one hand, and imposed BAMs on Parties of the same climate regime on the other hand. Obviously, such an approach would be perceived as contradictory and conniving. With good reason, it could be argued that BAM is only a tool for achieving through the backdoor what could not be accomplished at the climate change negotiations.

In addition to these concerns, it is not clear whether BAM are in fact a stick or an ineffective placebo. According to Reinaud, existing research suggests that BAM confined to those manufactured goods exposed to carbon leakage would cover a fairly limited subset of Chinese and Indian exports to the US and Europe. In the steel sector for example, most of the demand comes from China itself and trade flows are mostly within Asia. Houser has pointed out that while China accounts for 32% of global steel production, only 8% of the 353 million tonnes produced in 2005 was exported and less than 1% was sold to the United States. They also note that the US market accounts for only 3% of Chinese aluminium production, 2% of paper production, and less than 1% of both basic chemicals and cement.

Many developing countries would see a BAM as proof that climate change policies are in fact a protectionist agenda.

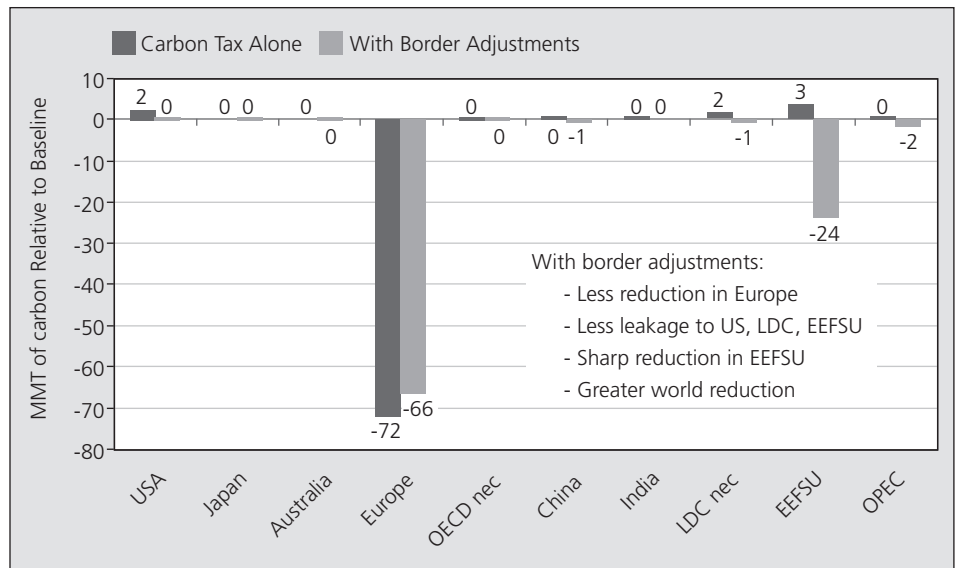
BAM is only a tool for achieving through the backdoor what could not be accomplished at the climate change negotiations. It may be argued that BAM are in fact a stick or an ineffective placebo.

6.3 Border Adjustment Measures: Environmental and Economic Effectiveness

BAM would have only limited potential to mitigate the possible distorting effects of climate change policies.

Assuming that specific industries will face carbon leakage – i.e. will lose market shares or reallocate operations due to carbon prices – the question is whether trade related measures could help to offset these additional costs. There has been extensive discussion on the environmental and economic effectiveness of measures addressing carbon leakage, such as allocation of free allowances, subsidies or BAM. While it is clear that any of these measures is bound to be a second best solution, with a global agreement imposing similar marginal costs to all emitters being the best option, it is doubtful that trade measures can actually deliver the desired effect, i.e. avoid leakage by levelling the playing field of competing industries.⁷⁸ Trade in cement, steel, aluminium, paper and basic chemicals, i.e. products that are most likely among those to benefit from a BAM scheme, is rather small with potential target countries, such as China or India. It therefore appears that BAM would have only limited potential to mitigate the possible distorting effects of climate change policies, as shown in the next graph.⁷⁹

Change in World Carbon Emissions in 2020 under European Policies



6.4 Border Adjustment Measures: How to Calculate It?

The calculation of BAM is obviously a decisive consideration. Since BAM aim to ensure the environmental integrity of climate policies and to level the competitive playing field internationally, carbon emissions must be treated equitably for both EU products and non-EU products entering the EU as imports. To do this fairly and in compliance with relevant WTO provisions, it is necessary to base BAM on the carbon embedded in the production of imported goods.

⁷⁸ Reinaud, 2008

⁷⁹ McKibbin, Wilcoxon, 2008

Many calculation proposals have been put forward. Although they differ considerably in detail, all proposals exclude *manufactured* goods, although inclusion of these goods would increase the amount of environmental leverage a BAM would provide. It is an insurmountable task in a globalised economy to calculate the carbon content of these goods, in particular if all emissions, from the resource extraction to selling the final product, are taken into account. Determining the quantity of embedded carbon in a product is further complicated by the fact that “variations in the type of energy used and the efficiency with which it is consumed can create dramatically different carbon footprints for goods that appear identical at the border” (p. 33). As Cosbey (2008) rightly points out “not only would the necessary data be unavailable for most producers (particularly in developing countries), it is also unlikely that the national authorities in those countries would rush to establish requirements that would make it available for that purpose” (p. 6). Interestingly, Parties to the Montreal Protocol decided to exclude manufactured goods that require ozone-depleting chemicals (ODCs) during production, but do not contain ODCs in their final form (due to calculation difficulties).

Against this backdrop, benchmarks or default values might be an alternative. As one example, reference to Best Available Techniques (BAT) could serve as a relevant benchmark for calculating carbon contents and thus a BAM. Ismer and Neuhoff (2004) describe the approach thus: “Whenever a product is imported into Europe, the importer has to pay a tax corresponding to the costs the most efficient producer in Europe incurs for emission certificates” (p. 6). However, the use of BAT benchmarks raises a number of critical questions:

Whenever a product is imported into Europe, the importer has to pay a tax corresponding to the costs the most efficient producer in Europe incurs for emission certificates.

- Determining a BAT is a challenge in itself, in particular because such a scheme would introduce a moving target. For this reason, some suggest mandating an independent body of experts to establish benchmarks/default values, but the composition of such a body, the rules and procedures of its operation and accountability/legal redress, as well as the substantive criteria for the benchmark itself would have to be clarified.
- BAT benchmarks will probably reduce the instruments’ ability to reduce leakage and would have to find ways to deal with imports cleaner than BAT. To meet WTO rules, benchmark levels must be „generous“, which in turn weakens the instrument’s ability to prevent leakage.

Regardless of the specific issues of a default value based on BAT, it is noteworthy that a GATT panel struck down a US regulation assigning imports a standardised baseline while domestic producers were allowed to present individualised data (US-Gasoline)⁸⁰. Moreover, this raises the question of why countries hostile to a BAM would present data on green house gases emissions of their imports, irrespective of the method of calculation.

Another possible way around this problem is to utilise an approach that calculates an average value for goods exported from a *specific* country. This is the approach put forward in the Lieberman-Warner Climate Security Act of 2008. This legis-

⁸⁰ See United States – Standards for Reformulated and Conventional Gasoline – Report of the Panel, WT/DS2/R, available from www.wto.org

lation intended to establish a system that, starting in 2014, would require importers of primary goods (iron, steel, aluminium, cement, glass, pulp, paper, chemicals, and industrial ceramics) and, potentially, manufactured goods to purchase “international reserve allowances” to cover emissions associated with production of the good. The legislation would also create an “International Climate Change Commission”, which would be charged with determining which countries are or are not taking so-called “comparable action,” and which manufactured goods should be included, but it does not specify exactly how these embedded-carbon figures would be calculated. While this proposal has been discussed intensively and worked its way up the political agenda, it contains fundamental flaws:

A calculation on country basis could trigger gaming strategies through deliberate changes in trade flows.

- The surrender of allowances would be subject to whether the trading partner has “comparable” climate policies to that of the importing country. On this point, as noted by a recent IEA report, two fundamental questions arise: How to measure comparability of efforts and monitor how policies evolve in each country? How to entice recognition of measures that are already implemented in a country such as China?⁸¹ There seems to be no sufficient answer to these questions, given that climate change and energy policies vary greatly and that a great number of policies will ultimately impact climate change policies?
- In addition, a calculation on country basis could trigger gaming strategies through deliberate changes in trade flows. Since BAM would apply only to countries which are not undertaking comparable emission reduction efforts, trade flows could be re-routed to deliver covered goods from countries that are not subject to the BAM scheme (Cosbey 2008). Houser et al. (2008) provide an illustrative example and argue that a BAM scheme applied unilaterally (in this case by US) that imposes border adjustments on Chinese steel and not on Japanese steel might simply cause increased flows from China to Japan, and increase flows from Japan to the United States, without in the end protecting US steel producers.⁸²

6.5 Border Adjustment Measures: Would It Comply with Trade Law?

There is no agreement on the legality of such a scheme under WTO law; with some authors denying the legality of BAM and others believing that it is legally feasible.

The legality of BAM has been a key issue, with WTO law taking the centre stage. There is no agreement on the legality of such a scheme; with some authors denying the legality of BAM and others believing that it is legally feasible. Despite this disagreement, it is generally agreed that the legality of each design option or case will depend largely on its specific details, which have yet to emerge. It is also generally agreed that legal risks will increase if the environmental effectiveness of a BAM is not plausible or if the calculation of BAMs cannot ensure equivalent treatment of domestic and imported products. At the same time, there is the dilemma that while BAMs may stand a greater chance to survive legal scrutiny if their calculation provides for equivalent treatment between domestic and imported products, equivalent treatment might only be achieved through default values, which in turn reduce the scheme’s environmental effectiveness and therefore jeopardize its legality.

⁸¹ Reinaud, 2008

⁸² Reinaud, 2008

In more detail, the relevant legal benchmarks for BAM are enshrined in the National Treatment Principle (GATT Article III), the Most Favoured Nation Principle (GATT Article I) and possible justification under GATT Article XX.

National Treatment (Article III GATT)

As a fundamental principle of world trade law, the National Treatment Principle (NTP) prohibits WTO Parties from treating national products differently than like imported products. Concerning taxes and charges, the NTP stipulates that the amount of the tax or charge imposed on imported and *like* domestic products has to be *identical* (GATT Article III:2 first sentence). If designed as internal tax or charge, a BAM must therefore levy imported products and *like* national goods in an identical way.

There is a longstanding debate on whether different energy consumption levels during production render products like or unlike. If different production methods make a product unlike, the imported product could be levied with charges or taxes higher than the national product.⁸³ However, given the overarching purpose of the WTO – liberalization of world trade – it is quite unlikely that different production methods render products “unlike”.⁸⁴ As a consequence, the challenge is to design BAMs in a way that imposes *identical* burdens on imported and domestic products. This is arguably an insurmountable task, because it is very difficult to calculate the exact carbon content/price paid by domestic producers (and importers).

The challenge is to design BAMs in a way that imposes identical burdens on imported and domestic products. This is arguably an insurmountable task.

In addition, the second sentence of GATT Article III:2 regulates directly competitive or substitutable products and is more lenient, in that the amount of imposed BAM may be slightly dissimilar (*de minimis*). However, III.2.2 GATT additionally requires that the internal tax or charge is not applied in a protective manner. For this reason, official documents showing that BAMs are conceived as a tool to level the competitiveness playing field of EU or US industries and a corresponding rhetoric by decision-makers may pose further challenges for the measure’s legality.

BAMs that are not taxes or charges must comply with GATT Article III:4. This provision is based on elements that are very similar to the second standard of GATT Article III:2. However, detrimental effects for a given imported product unrelated to the origin of that product do not violate the legal standard under GATT Article III:4. The obligation to purchase allowances imposed on imported products would have to be based on the same, or at least equivalent, conditions as those underlying the obligation to purchase ETS allowances imposed on the like (or directly competitive or substitutable) domestic products. Such a scheme would again face similar calculation difficulties as a tax or charge, since it would also be based on the carbon embedded in the imported product.

⁸³ Various rulings of GATT and WTO panels have dealt with the issue of “likeness”. Although the case law has developed a set of likeness criteria, the issue of likeness remains open and will be decided on a case by case basis. However, it is important to note that products are probably alike if they are in a competitive relationship, regardless of production methods. Given the overarching purpose of the WTO – liberalization of world trade.

⁸⁴ See the box on Technical Standards, Labelling and World Trade Law, p. 12

Both in the US and in the EU, the BAM-discussion has shifted from imposing a tax or charge on imported products to requiring importers to purchase allowances or allocating free allowances to domestic producers affected by international competition. Both options raise similar legal concerns to border adjustment based on taxes or charges.

Most Favoured Nation (Art. I GATT)

Next to the NTP, the Most Favoured Nation Principle is another fundamental principle of world trade law that is relevant when determining the legality of a BAM. The NTP requires every WTO Member to extend any kind of advantage (e.g. a tariff reduction) that it has granted to one WTO Member to all other WTO Members. A BAM is likely to target imports from countries with no/less ambitious climate change policies. A BAM therefore raises concerns under the Most Favoured Nation principle (MFN), because it differentiates between imported products of different national origins, either directly (e.g. by differentiating between Kyoto signatories and non-signatories) or indirectly (e.g. by using requirements or procedures that *de facto* favour one country of origin over another).

BAMs would be imposed on imports from specific countries (with certain climate change policies), a scheme prohibited by Art. I GATT as de facto discrimination.

- The notion that BAMs refer to specific domestic climate change policies and NOT to the country of origin is problematic: BAMs would be imposed on imports from specific countries (with certain climate change policies), a scheme prohibited by I GATT as de facto discrimination (“unconditional”).
- Given (1) the caveats in comparing climate and energy policies of different countries and (2) the broad interpretation of Art. I GATT, the Appellate Body (AB) is likely to assume de facto discrimination if BAMs are based on the levels of ambition of national climate change policies.

Justification under Article XX GATT

Even if a BAM violates the Most Favoured Nation Principle or the National Treatment Principle, it may be justified under the general exceptions set out in Art. XX GATT.

Even if a BAM violates the Most Favoured Nation Principle or the National Treatment Principle, it may be justified under the general exceptions set out in Art. XX GATT, and thus still be considered admissible. Art. XX GATT contains two exception clauses which could justify BAM motivated by climate and energy policies: one applies to measures “necessary to protect human, animal or plant life or health” (Art. XX(b) GATT), the other to measures “relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption” (Art. XX(g) GATT). In addition, an introductory paragraph, or chapeau, requires that BAM “are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade”.

Given their objective to promote effective protection of the global climate, BAM based on carbon or energy intensity fall under g), and possibly under Art. XX (b): Concerning the justification of measures, under Art. XX g): „related to the conservation of exhaustible natural resources“, a substantial link to the measure’s (environmental) purposes must be established. This is problematic if the BAM has only limited environmental performance and the competent government cannot demonstrate its potential to reduce leakage. However, the Appellate Body, the

highest judicial body of the WTO, has not engaged in a detailed analysis of the environmental effects of the measure in question in its case law to date. WTO Members thus have wide discretion.

The “chapeau” of Article XX serves to prevent an abuse of the right to take exceptional measures for general policy purposes (“no unjustifiable or arbitrary discrimination and disguised trade restriction”). In GATT/WTO case law, the chapeau has been a critical hurdle, as evident in the cases *US – Gasoline*, *US – Shrimp* or *Brazil – Tyres* or.⁸⁵ The provision requires that BAMs only differentiate between countries for purposes of climate protection. Hence, the following legal problems could stem, inter alia, from the chapeau:

The “chapeau” of Article XX serves to prevent an abuse of the right to take exceptional measures for general policy purposes. In GATT/WTO case law, the chapeau has been a critical hurdle.

- BAMs that simultaneously reduce or eliminate the burden on domestic producers (e.g. through the free allocation of allowances) and cumulatively burden imports of competing products will most likely be considered as a disguised trade restriction (*Brazil – Tyres*).
- To avoid arbitrary discrimination, importers must be allowed to prove their individual emissions, and national circumstances in exporting countries need to be taken into account. If BAMs were to allow for such exemptions, that might help render the scheme WTO compatible, but is likely to further reduce its effectiveness.
- Moreover, the chapeau of Art. XX GATT requires governments to act in good faith⁸⁶ – a principle also enshrined in general international law. A government that first negotiates a multilateral climate agreement and then takes unilateral trade measures on top of it may well be seen as acting in breach of this principle.
- If revenues were used for the general state budget and/or other non-environmental purposes, the required environmental purpose of the BAM would be undermined, raising additional legal uncertainties under the GATT. If the revenues were recycled back to affected industries, it could be alleged that the EU subsidizes particularly dirty industries. If these subsidies are trade-distorting and industry-specific, WTO law could be violated.

85 See *United States — Standards for Reformulated and Conventional Gasoline*, WT/DS2/AB/R; *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/AB/R; *Brazil – Measures Affecting Imports of Retreaded Tyres*, WT/DS332/AB/R; all available at www.wto.org

86 This was made clear by the Appellate Body in its decision in the case *Brazil – Measures Affecting Imports of Retreaded Tyres*, WT/DS332/AB/R, para. 215,

7 Policy Recommendations

Based on the preceding findings, this study puts forward the following policy recommendations. The ordering of the recommendations does not reflect their political relevance, but merely mirrors the structure of the report:

Liberalization of Trade in Environmental Goods and Services (EGS)

Trade liberalisation is expected to boost the dissemination of EGS. The World Bank, for example, estimates that the complete elimination of tariffs and non-tariff barriers would lead to an average increase of trade in clean coal technology, wind/solar power generation and efficient lighting technology by 13,5% compared to the current level, with variations across technologies and countries. However, negotiations in the WTO on EGS have not progressed far and consensus is not within sight, in particular because difficult technical and political issues have not been solved. It appears that a workable compromise should be based on:

A workable compromise should be based on: the trade/environmental and the development objectives of the Doha round, and a clear definition of EGS.

- the trade and environmental objectives of the Doha round, i.e. privileged treatment of EGS through wide trade liberalisation,
- the development objectives of the Doha round, i.e. developed countries should be ready to accept lower tariffs for imports from developing countries and should be prepared to agree to some type of protection of developing country markets in the short term,
- a clear definition of EGS. A list approach, including a broad range of products, including areas where developing countries may compete, is therefore preferable.

Technical Standards and Labelling

Technical standards and labelling have great potential to reduce energy consumption and emissions in a cost-effective manner. Current standards and labelling schemes within the OECD, for example, are generally credited with reducing total energy bills across the affected broad end-user sectors, e.g., the residential sector, by between 10 and 20%.

Potential tensions between international trade law and national standard and label schemes should be reconciled by applying certification and accreditation processes that are in line with international recommendations, in particular ISO standards.

Potential tensions between international trade law and national standard and label schemes should be reconciled by applying certification and accreditation processes that are in line with international recommendations, in particular ISO standards. In general, differences in energy performance test procedures, certification, accreditation and compliance regimes should be minimized. There is a need for international efforts to harmonize product standard-related procedures and norms in a way that both facilitates trade and benefits the environment. Although simplification and coherence are important objectives in and of themselves, it should be noted that coherence should not undermine the ambitions of energy performance standards and labels. In this context, trade policy makers should

treat standards and labels with deference, and not automatically assume that they are unnecessary barriers to trade. Moreover, even though efforts at harmonization should be made, these should not lead to harmonizing standards at the lowest common denominator.

Subsidies to Fossil Fuels

Subsidies for fossil fuels are rampant in many countries, although they have various negative effects: they distort international trade, impede innovation, significantly hamper the deployment of clean energy production and absorb scarce resources for other policies that are vital for development, e.g. education, health, infrastructure or environmental protection. As a result, the reduction, and ultimately the abolishment of subsidies for fossil fuels is a key measure for protecting the environment and liberalizing international trade, while enhancing long term development goals. Nonetheless, governments have to take the social side of energy prices into account and are subject to considerable domestic pressure when reducing subsidies.

Addressing this dilemma, governments and other relevant stakeholders should explore ways to reduce and abolish subsidies for fossil fuels. This would likely have to involve offering some compensation for increased energy prices. In developed countries, this may include such measures as reducing income taxes or lowering contributions to social security. In developing countries, these measures should also be considered, provided a functioning tax and welfare system is in place; if not, direct compensation for health or education costs could be another possibility. Obviously, such reform is a huge challenge in any country, let alone developing countries, which sometimes suffer from close relations between governments and energy providers as well as limited public participation and corruption. Regardless of the size of the challenge, the potential benefits of such reforms are great and warrant a strong effort. International discussions and fora should more strongly support national efforts in reforming fossil fuels. These international efforts could provide additional fora and could play an important role when addressing deeply entrenched interests of specific domestic players. It is unfortunate that the WTO has only a limited mandate to address environmentally harmful subsidies; a wider mandate allowing the WTO to deal with existing non-specific, environmentally harmful and trade distorting subsidies should be considered.

Technology Transfer and Intellectual Property Rights

Even though precise data on public funds for the transfer of climate-friendly technologies is not available, existing data indicate that developing countries are correct in complaining about insufficient levels of technology-transfer. Current levels of funding should be raised. In addition, establishing mechanisms such as the CDM, which induce technology transfer, should be further explored and, possibly, extended.

In the context of technology-transfer, the role of IPR is ambiguous. It is assumed that IPR may constitute both incentives and obstacles to technology-transfer. Existing empirical knowledge – although limited – suggests that patent protection

Governments should explore ways to reduce and abolish subsidies for fossil fuels. This would likely have to involve offering some compensation for increased energy prices.

IPR may constitute both incentives and obstacles to technology-transfer.

Concerning the WTO TRIPS Agreement, developing countries should be advised on existing flexibilities.

does not inhibit technology transfer and that the Kyoto Protocol has promoted technological innovation. Finally, it is necessary to ensure that existing international legal rules do not impede the transfer of technology. Concerning the WTO TRIPS Agreement, developing countries should be advised on existing flexibilities of TRIPS in the framework of technical assistance. Moreover, states should refrain from bringing complaints against other WTO Members for adopting climate-friendly measures, in IPR law or in other areas of law. Concerning investment treaties, clauses should be added that non-discriminatory, environmental measures are not considered an expropriation or otherwise a violation of such treaties.

Border Adjustment Measures

There are longstanding concerns in countries with (ambitious) climate protection measures in place that these measures put their industries at a competitive disadvantage compared to other countries that have not introduced similar policies. Not only could this affect the economic prospects of these industries, it could also undermine the environmental effectiveness of underlying climate policies by causing “leakage” – a relocation of manufacturing capacities (and thus greenhouse gas emissions) to countries with more relaxed environmental standards. Unsurprisingly, fears of carbon leakage have translated into active consideration of measures to help avert such undesired effects, among them trade measures in the form of border adjustment measures (BAM). However, climate change policies have been in place for some time now, and there is no evidence that the existing policies have caused carbon leakage. Specific surveys of the first commitment period of the European Emission Trading scheme have not produced any supportive evidence thereof. While the past might not support the assumption of leakage, this picture could change for specific industries in the future, in particular when specific instruments overcome their initial learning phases and become effective in attaining their reduction targets.

BAM are a last resort and should only be seriously considered when all other means have been exhausted.

Border adjustment measures can take different forms, such as taxes or charges, an obligation to purchase emission allowances upon importation, quotas or technical standards or regulations. Although different design options will differ in impact, this study concludes that BAM are a last resort and should only be seriously considered when all other means have been exhausted, because the potential disadvantages of BAM seem to outweigh possible benefits. The BAM discussion has the potential to divert attention from the real problems and undermine the notion of environmental policies as a driver of innovation and competitiveness (in times of high energy prices).

Differentiation through emissions targets and additional multilateral obligations on policies and measures in the climate sector is the key to addressing leakage and competitiveness concerns.

As a global problem, climate change requires multilateral solutions that might be harmed by unilateral approaches, in particular if these have confrontational elements. Differentiation through emissions targets and additional multilateral obligations on policies and measures in the climate sector is the key to addressing leakage and competitiveness concerns. For these reasons, it is questionable whether the BAM discussion should be continued. However, given the current dynamics of international and domestic climate change politics, some form of BAM is likely to remain on the political agenda – and the more ambitious the climate change policies under discussion, the higher the position of BAMs on the agenda.

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Ecologic is a private not-for-profit think tank for applied environmental research, policy analysis and consultancy with offices in Berlin, Brussels, Vienna, and Washington DC. It was founded in 1995. An independent, non-partisan body, Ecologic is dedicated to bringing fresh ideas to environmental policies and sustainable development. Ecologic's work programme focuses on obtaining practical results. It covers the entire spectrum of environmental issues, including the integration of environmental concerns into other policy fields.

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