BIS Department for Business Innovation & Skills

**TRADE & THE ENVIRONMENT**

# Trade and Investment Analytical Papers Topic 14 of 18

DFID Department for International Development

# Contents

# TRADE POLICY AND THE ENVIRONMENT

## Summary

The many interactions between trade and the environment are of increasing interest to governments. This paper provides a short review of some of the main overlaps which have particular relevance for trade policy. Trade liberalisation can facilitate a more efficient use of resources, and promote the diffusion of environmental goods and technologies, supporting environmental policy objectives such as carbon emissions reductions. But it can add to environmental problems if these are left uncorrected. Environmental policies can also increase trade in 'green' goods and services, benefiting UK exporters.

However, differences in environmental regulation between countries can adversely affect competitiveness, and trade and investment themselves can limit the effectiveness of national environmental policies. This has generated policy frictions and the calls for trade-offs including demands for the imposition of extra trade restrictions at the border. If adopted, such trade restrictions would impose significant costs. In other cases, environmental regulation can be implemented in such a way as to constitute a barrier to trade. Reliable and objective methods for assessing the environmental impact of traded goods, and associated labelling, provide important ways of helping trade support environmental objectives. But here too there can be risks for open markets. Finally, a meeting of trade policy and environment policy is occurring in a number of specific areas such as biofuels markets, fossil fuel subsidies and rare earth export restrictions.

## 1. What are the environmental impacts of trade liberalisation?

### 1.1 Overview

It is now widely accepted that trade liberalisation brings economic benefits through greater efficiency, competition and choice.[1] The environmental impacts of trade liberalisation are more complex. Trade liberalisation tends to increase the scale of economic activity, and can lead to production moving to areas with lower environmental standards, both of which can add to environmental problems. But by removing price distortions, trade promotes efficient production techniques and resource use, improves access to

[1] See, for example, the accompanying BIS analytical papers on Trade and Openness and Protectionism. These papers, as well as the 2011 Trade and Investment White Paper, can be found at: http://www.bis.gov.uk/policies/trade-policy-unit

environmental technologies, and leads to more innovation, all of which provide potential environmental benefits.

The balance of evidence[2] suggests that, for some pollutants such as sulphur dioxide emissions, trade liberalisation has resulted in overall environmental improvements. In terms of $CO_2$ emissions, the results are more varied, with a number of studies finding that $CO_2$ emissions increase overall.

The focus of many national environmental policies has traditionally been on the impacts of production. However, increased trade implies a growing divergence between domestic production and consumption patterns, as well as growing and more complex global supply chains. As a result, there has been a shift of focus towards the environmental impact associated with domestic consumption patterns.

Research for Defra on the scale and distribution of UK 'consumption emissions', for example, shows that between 2000-2008, while UK territorial greenhouse gas emissions decreased slightly, consumer emissions increased by 15%. Taking a consumption emissions approach, 55% of the total emissions associated with goods and services purchased by UK consumers occurred overseas, with 78% of these occurring outside the EU.[3]

This highlights the need for a global perspective to complement domestic environmental policy. In the long term, a comprehensive global climate deal would provide assurance on the control of overseas carbon emissions associated with goods destined for UK consumption. In the absence of this, evidence on the scale and nature of these impacts helps inform and target a range of actions to address them including climate agreements, business management of supply chain impacts, product standards and labelling schemes. Ironically, more complex supply chains make it more difficult to estimate consumption impacts as many countries can make up the complete supply chain for a single product. This has important implications for the feasibility of labelling schemes (Section 3) and the use of trade measures to tackle carbon leakage (Section 2).

## 1.2 Trade can help enable a move towards a greener economy

Trade facilitates the diffusion of goods, services, technologies and ideas required to address environmental challenges and can support a more efficient use of resources by businesses and households.

Concern over environmental issues, reinforced by government targets and policies[4] has led to a growing global low carbon and environmental goods and services market, offering opportunities for UK exporters. The global market for

[2] WTO and UNEP (2009) review some major econometric studies into the impacts of trade liberalisation on the environment, including carbon emissions. For wider impacts of economy-environment links, see DEFRA (2010) and IEEP (2005) report for DEFRA

[3] Wiedmann et al (2008) report to Defra

[4] For example, the EU has committed to 20% emissions reduction by 2020; the UK's 2008 Climate Change Act commits to an 80% reduction by 2050.

low carbon and environmental goods and services, intermediates,, has been estimated at £3.2tn in 2009/10, of which the UK accounted for £116bn[5]. The UK was a net exporter of low carbon and environmental goods and services, with exports of £11.3bn and imports of £6.3bn. The UK low carbon and environmental sectors is forecast to grow by an average of 5.4% per year over the next five years. Wind (around 8% per year) and carbon finance (around 11% per year) show particularly strong growth.[6]

Analysis by BIS and Innovas suggests the UK has a 'comparative advantage' in environmental consultancy and the wind energy sector, along with recycling, pollution, and solar.[7] UKTI analysis found UK performance in 7 key export markets, including Brazil, China and India, to be strongest in water and waste management, environmental consultancy, generation technologies, asset management and carbon finance.[8]

## 1.3 Liberalising trade in environmental goods and services: a win-win

The liberalisation of trade in environmental goods and services (EGS) would bring benefits over and above the wider merits of liberalisation, including increased uptake of EGS, improved cost-effectiveness of new technologies, more innovation in environmental and low carbon goods and the promotion of sustainable development in developing countries.[9]

Attempts to liberalise tariff and non tariff barriers were made as part of the Doha round of multilateral negotiations.[10] Although there is general agreement about the benefits of such liberalisation, negotiations have stalle Crucial issues to be resolved include the definition of environmental good the coverage of an agreement, the means of liberalising, and how non-ta barriers should be addressed.[11] A list of 153 goods has been discussed at the WTO, with 43 of these designated as 'climate friendly'.[12]

### 1.3.1 What is an 'environmental' good or service?

There is no single agreed definition of what constitutes an 'environmental good or service'. Some use a fairly narrow definition of goods which directly address an environmental problem, such as waste management goods, while others take a broader view and include 'environmentally preferable' goods that are relatively more environmentally friendly than other substitutes, such

[5] BIS (2011) Low Carbon and Environmental goods and Services
[6] BIS (2011) Low Carbon and Environmental goods and Services
[7] BIS Economics paper – Towards a Low Carbon economy (2009). Analysis on RCAs by Innovas. Comparative advantage exists where a country can produce a good at a lower relative cost than other goods. Revealed comparative advantage (RCA) estimates this by comparing the proportion of a country's exports in a good out of its total exports to that of the world.
[8] BIS (2009)
[9] See for example Stern (2006)
[10] The Doha declaration agreed to look at liberalising trade in environmental goods http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm
[11] See IISD (2008) 'Liberalisation of Trade in Environmental Goods for Climate Change mitigation: The Sustainable Development Context' for a discussion of the main challenges involved
[12] The list of 43 climate friendly goods can be found in the annex of World Bank (2008)

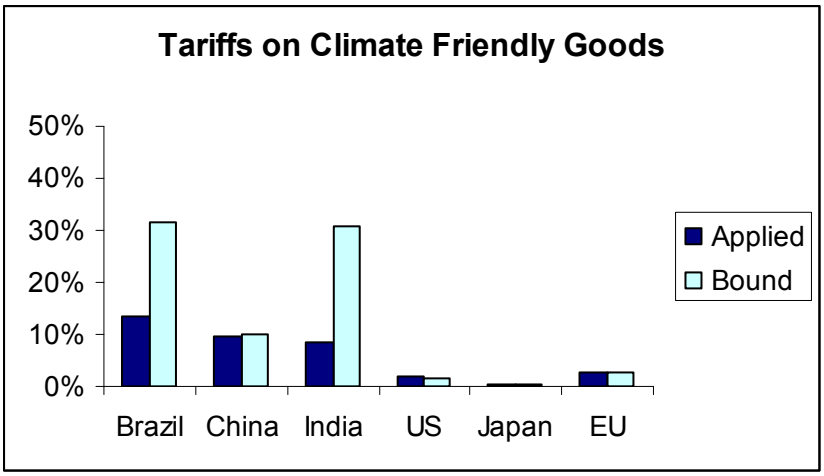
as wind turbines.[13] Another important issue is whether intermediate goods and each stage of supply chains should be covered in a definition as well as final products.

This matters because, as with all negotiations, countries have certain offensive and defensive interests, and the absence of an agreed definition has proved to be a stumbling block.

### 1.3.2 What are the current barriers to trade in environmental goods and services?

The current patterns of protection of environmental goods have also presented problems: in particular, applied tariff rates are generally higher in developing countries than in developed countries.[14]

**Chart 1 Tariff levels on the 43 'climate friendly' goods**




Source: World Bank WITS, 2009

Because of this, it is likely that developing countries would end up reducing their tariffs by more in absolute terms than developed countries. To engage developing countries in tariff negotiations, a broader framework may therefore be needed, e.g. one covering technology transfer and financing arrangements, though this also presents problems.[15] The UNFCCC process could be one means of delivering technology transfer through, for example, the Kyoto protocol's Clean Development Mechanism (CDM).[16]

Tariffs on industrial goods are often low, so non-tariff barriers (NTBs) have assumed greater significance, and would need to be addressed as part of any

[13] The OECD's definition is: "…goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems." A report for BIS by kmatrix (2011) used a broader definition that includes the various stages of supply chains involved in the production of environmental goods.

[14] World Bank (2008)

[15] ICTSD (2008) has a discussion of the role of technology transfer and examples of IP limitations faced by developing countries. Chatham House (2009) provides an in-depth study of IPR and technology transfer issues

[16] It has been claimed that 36% of the projects in the CDM involve technology transfer. The UN's Technology Needs Assessment (TNA) programme also provides a framework to consider the mitigation and adaptation technology priorities of developing countries.

liberalisation deal. They are, however, inherently difficult to measure in the same way as tariffs. For example, an OECD survey found that the main complaint from exporting firms of environmental goods was with the protection of intellectual property rights (IPR) in China. Another study, by the World Bank,[17] estimated that NTBs can have a monetary value exceeding that of the tariff in many cases.

More generally, factors other than tariffs are likely to provide a better explanation for increased trade of renewable energy goods, notably domestic environmental policies and regulations, level of income, FDI, and subsidies.[18]

### 1.3.3 What would be the costs and benefits from a deal liberalising trade in EGS?

Although no definition or scope has yet been agreed, a liberalising deal could result in fairly substantial economic and environmental benefits according to analyses by the World Bank[19], the European Commission[20] and the IISD[21]. The World Bank, for example, found that liberalising tariff and non tariff barriers on four clean energy technologies would boost trade by 7.2% -13.5%.

**Table 1: A selection of recent estimates (not directly comparable):**

| Study | Findings | Notes and assumptions |
|---|---|---|
| World Bank (2008) | 7.2% increase in trade volumes in 18 developing countries if tariffs eliminated on 153 good list; 13.5% increase if NTBs also addressed | Looks at 4 sectors: clean coal, wind energy, solar PV, and energy efficient lighting.<br><br>Elasticity assumptions from World Bank Global Monitoring Report database |
| European Commission (2010) | Increase in global trade of €14bn | Reduction in environmental goods tariffs from 4.4%-3.6%, in line with current Doha proposals |
| IISD (2009) | 0.1-0.9% (45-355 Mt $CO_2$/yr) reduction in projected GHG emissions by 2030. | Based on the 153 good list; assumes tariffs account for a 5% share of emissions savings from renewables |

### 1.3.4 Development Issues

Trade liberalisation can also contribute to development aims: the UNDP argues that none of the Millennium Development Goals can be met without major quality and quantity improvements in energy.[22] Lack of electricity and

[17] OECD (2007) and World Bank (2008)
[18] See ICTSD/ Jha (2008)
[19] World Bank (2008) The World Bank estimates are 'first round' effects. They use simple elasticities to estimate the increase in trade volumes arising from the fall in prices after tariffs are reduced, and do not take into account absorptive capacity and the broader investment climate, which in practice would make the relationship more complex
[20] European Commission (2010)
[21] IISD (2009) 'Greenhouse Gas Emission Impacts of Liberalising Trade in Environmental Goods'. Assumes tariffs account for a 5% share of the cost reduction required to make renewables financially competitive with fossil fuel generation and therefore a 5% share of the potential emissions reductions attributed to renewable generation under an IEA scenario.
[22] http://www.undp.org/energy/

heavy reliance on traditional energy sources can affect health, education, the environment, and agricultural productivity.[23] Developing countries are likely to be disproportionately affected by the impacts of climate change, so access to adaptation and mitigation technologies will be crucial.

As with all trade liberalisation, there would be short term costs. These include adjustment costs (due to the reallocation of employment and production). For developing countries where tariffs are higher, loss of tariff revenue can be significant, as illustrated below.

**Table 2: Estimated tariff revenue from the 43 'climate friendly' goods:**

| | Value of imports of 43 goods ($bn), 2010 | Estimated tariff revenue[24] ($m) |
|---|---|---|
| **Brazil** | 2.8 | 356 |
| **China** | 19.4 | 933 |
| **India** | 3.1 | 230 |
| **US** | 24.2 | 410 |
| **Japan** | 6.1 | 20 |
| **Extra EU** | 44.8 | 302 |

*Source: BIS using World Bank WITS 2009 data*

### 1.3.5 Other trade agreements also aim to improve environmental protection

There are often more general provisions in trade agreements to take into account the environmental issues. For example, environmental sustainability provisions increasingly feature in the EU's Free Trade Agreements[25] and the EU's GSP+ scheme offers additional trade preferences to developing countries that have ratified and effectively implemented 27 international conventions, including some relating to the environment.

The recent Mid Term Evaluation of the EU GSP+ scheme[26] found little evidence that it promoted effective implementation of environmental conventions. The potential environmental impacts of trade agreements can vary significantly. An impact assessment for the EU-India FTA negotiations, for example, found only limited environmental impact[27]. However this was not the case for the EU-Andean FTA[28], where impacts related to deforestation and loss of biodiversity are particular concerns.

[23] UNCTAD (2009)
[24] NB: the estimated revenue does not take into account trade in preferential schemes such as the EU's GSP.
[25] DG Trade sustainability Impact Assessments: http://ec.europa.eu/trade/analysis/sustainability-impact-assessments/assessments
[26] CARIS, University of Sussex (2008)
[27] EU India FTA Sustainability Impact Assessment http://trade.ec.europa.eu/doclib/docs/2009/june/tradoc_143372.pdf
[28] EU Andean FTA Sustainability Impact Assessment http://trade.ec.europa.eu/doclib/docs/2010/april/tradoc_146014.pdf

# 2. Carbon leakage and border adjustment mechanisms

## 2.1 Introduction

International negotiations and other policies to limit global carbon emissions can be seen as part of a broader effort to incentivise abatement and promote the use of environmentally friendly goods and services. These efforts however have brought to the fore another possible interaction between trade policy and environmental policy: Border Adjustment Mechanisms (BAMs) to tackle carbon leakage.

Although many countries pledged to reduce emissions under the Copenhagen Accord, there was no legally binding international agreement. As a result, countries keen to move forward on cutting carbon emissions are increasingly concerned about competition from countries which do not put a price on carbon emissions and the resulting, so-called 'carbon leakage'

## 2.2 What is Carbon Leakage?

At a broad level, carbon leakage can be defined as any increase in greenhouse gas (GHG) emissions overseas that results from unilateral carbon reduction policies at home. Leakage can arise through a number of channels:

- domestic producers (e.g. those subject to the ETS) lose market share to imports as a result of higher carbon costs, in comparison to those faced by their competitors outside the ETS, and an inability to pass through those costs;
- diversion of investment from countries with more ambitious carbon constraints to those with less ambitious ones;
- through (fossil-fuel) energy markets, as unilateral carbon reduction policies causes a reduction in demand for energy at home, putting downward pressure on world prices and boosts energy consumption overseas.

Leakage is an environmental issue as it undermines the effectiveness of domestic carbon emissions caps and may limit the uptake of environmental goods and services at home and abroad. Industry, however, often sees this as an issue of fairness, objecting to the loss of competitiveness because their governments take on more stringent emissions targets than their competitors.

## 2.3 Border Adjustment Mechanisms (BAMs)

Carbon leakage concerns can be addressed in a number of ways, including a global deal to limit carbon emissions, bilateral or sectoral agreements, subsidies and free emissions allowances to domestic firms, and - the focus of this paper - trade measures, or so-called Border Adjustment Mechanisms (BAMs). BAMs are levies imposed on imports based on the carbon emitted during the production of those goods and the price of carbon faced by comparable goods in the importing country. They can come in a number of forms, but the essential aim is to equalise the carbon prices faced by imports and domestically produced goods.[29]

## 2.4 Motivations for BAMs

It is possible to distinguish three main motivations for BAMs:

- to address the environmental consequences of carbon leakage;
- to deal with competitiveness concerns of domestic industry, and indirectly help achieve buy-in from them to take on more stringent emissions cuts[30];
- to put pressure on trading partners that have failed to sign-up to sufficiently ambitious climate change commitments.

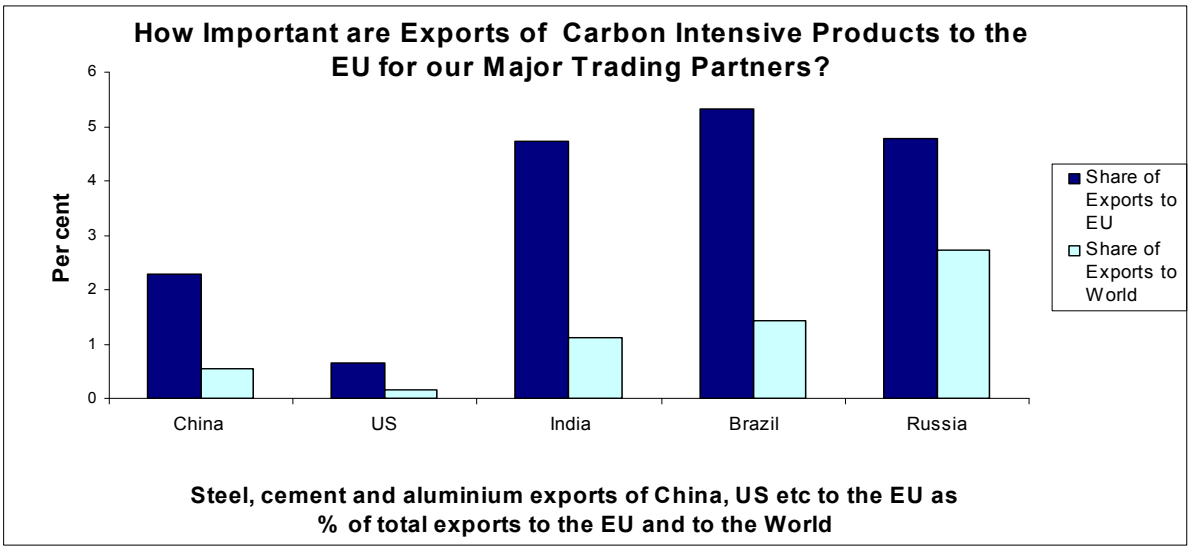
The optimal design of a BAM depends on the precise motivation. A BAM designed to address leakage will differ from one aimed at influencing international negotiations. A BAM aimed at putting pressure on trade partners might require a larger tariff than merited by carbon cost differences alone, as well as the application of a BAM to sectors other than those at significant risk of carbon leakage.

To illustrate this, imposing a BAM in three of the main EU sectors thought to be susceptible to carbon leakage (steel, cement and aluminium) is unlikely to have much influence over countries such as China. Chinese exports to the EU of these products account for the just 2.3% of total Chinese exports to the EU and 0.6% of Chinese exports to the world.

[29] BAMs can also be applied to exports, in the form of a rebate of the carbon price on sales overseas, thus ensuring domestic firms are not faced with a competitive disadvantage in export markets because their production is subject to more stringent carbon emissions caps.

[30] It is worth noting that the use of BAMs only to address competitiveness concerns or to put pressure on negotiating partners would not be WTO compatible. In practice another justification would have to be found for BAMs even if the underlying motivation were competitiveness concerns or negotiating leverage.

## Chart 2: The Importance of Carbon Intensive Products in Trade




*Source: COMTRADE*

Similarly, as leakage can occur through energy markets (the third channel above) a BAM aimed at addressing the just direct competitiveness effects of an ETS would fail to stem fully carbon leakage.

Opinion on the use of BAMs is divided. While alternative policies aimed at tackling carbon leakage, such as free allocation of emissions allowances, have costs and other weaknesses, BAMs are especially controversial in trade policy circles. There are concerns that they could be captured by protectionist influences in the same way as other trade instruments such as Anti Dumping,[31] that they will be difficult to design in a manner consistent with WTO rules and that they will be administratively complex, restricting trade above and beyond their intended effects. A further concern is that they will complicate international trade and climate change negotiations, resulting in protectionist retaliation in the former arena and making the achievement of an international climate agreement more challenging.

However, others argue that BAMs would address carbon leakage more effectively than free allocation in some cases as the latter risks granting windfall profits to sectors. Some research acknowledges the administrative complexity involved in designing a BAM, but suggests a tailored approach to addressing carbon leakage i.e. applying a BAM to certain less complex sectors and free allocation to those that are more complex.[32]

[31] It may be more illustrative to look at the development of the use of so-called trade defence instruments in international trade, and in particular, Anti Dumping, to shed light on what the introduction of a BAM might mean. Originally conceived as an instrument to tackle anti competitive pricing in international markets, its use has spread to countries and products well beyond this objective. According to some commentators, it has been captured by protectionist interests and/or had a number of unintended costs - see for example Messerlin (2000). There are very real concerns that a similar pattern could emerge if the EU or US were to implement BAMs.

[32] Droege et al, Tackling Leakage in a world of unequal carbon prices, Climate Strategies 2010

## 2.5 How much of a concern is Carbon Leakage?

This is itself a controversial issue both conceptually and empirically. The results of research varies depending on the definition of carbon leakage adopted, (e.g. whether leakage via energy markets is included), the timescale over which the risk of leakage is assessed, and the definition of "at risk".[33]

## 2.6 Modelling BAMs and its limitations

There have also been a number of attempts to model the effects of BAMs, including simulations by the World Bank, OECD, Cambridge Econometrics, Carbon Trust and the Netherlands Bureau for Economic Policy Analysis.[34]

The results depend to some extent on the specification and assumptions of the model used. While these models offer some useful insights, for example, that where leakage through energy markets is dominant, BAMs are largely ineffective at tackling leakage, they also have some major limitations. Notable among these is a failure to include consideration of the main costs of BAMs: administration costs, protectionist capture, and risks of retaliation and dispute.

Another difficulty is that models fail to reflect the very real risks of circumvention of BAMs. Such circumvention could take place through, for example, transhipping exports through third (non-targeted) countries, by reallocating production between domestic and export markets or by moving up the value chain.

Finally, India, China and a number of other countries have already signalled their opposition and their readiness to take retaliatory action. There is a wider concern that the introduction of BAMs, even on a limited basis, could sour international trade relations. This could be the biggest risk of all, yet is inherently difficult to reflect in economic models.

## 2.7 The Design of a BAM

Recent literature has focussed on BAM design. This highlights problems of satisfying three requirements of a BAM: offsetting carbon leakage, WTO compatibility and being administratively manageable and cost-effective. It has also highlighted the range of issues of detail which need to be resolved before a BAM is implemented: which countries should be subject to the BAM; which sectors; how to set the size of the tariff; how often to adjust it; how to prevent circumvention; how to assess the carbon footprint of imports sourced from complex supply chains; how to take account of the special situation of developing countries; and how to minimise border costs.

[33] See for example, OECD (2009), Carbon Trust (2009), CPB (2011) and Cambridge Econometrics (2010).
[34] Examples include CPB (2011), OECD (2010), Mattoo et al (2009)

Sussex University highlight other difficulties in arriving at appropriate carbon tariff. For some products, even relatively simple ones like steel and cement, it is difficult to be sure of the exact carbon content and hence the level at which to set the border levy. For example, in cement the estimated levy could be between 13-21%, while in the case of steel, production in mini mills rather than integrated mills emits less than one-third as much CO2. And electricity produced from coal emits 2-3x CO2 than electricity produced from gas.

In the case of cars, the complexities of estimating the appropriate carbon tariff are enormous. Despite this, using reasonable assumptions, the actual tariff is likely to be very small (0.35%) compared with the value of the car, and will almost certainly be exceeded by the administrative costs of estimating and implementing the tariff.

A recent paper by the Swedish National Board of Trade looks at the challenges of designing a system of BAMs from a trade facilitation perspective. It concludes that the WTO compatibility of BAMs remains uncertain and depends crucially on the design features. But the administrative costs of such a system cannot be ignored. If the aim is to differentiate between high and low emission products, there would need to be very onerous administrative requirements if the BAM is to work, reflecting among other things the complexity of global supply chains. But if a BAM is simplified, the environmental incentives are reduced. [35]

## 3. Environmental Regulation, labelling and sustainability

The role of technical regulations governing the production or performance of goods in achieving environmental objectives has long been recognised. So too has the possibility that these regulations can impede international trade, particularly when applied in a discriminatory or unnecessarily trade-restricting manner.

At least as important for promoting environmental objectives are standards and consumer labelling. They can help inform consumers and incentivise producers, thereby promoting the production and consumption of, and trade in, environmentally-friendly goods. They can also have important trade policy implications and have been the focus of growing attention in recent [36]years.

[35] The more precise the BAM is, the higher the administrative costs for both the private and public sector. Each carbon footprint, it is estimated, could vary between $5,000 and $70,000 – and there is no commonly accepted methodology for undertaking such assessments. And the more complex the product, the more complex the calculation. In the absence of harmonisation of approach to BAMs, traders could be faced with additional costs associated with having to meet different requirements and standards in different export markets.

**[36] See for example Verbruggen, Kuik and Bennis, R Environmental Regulations as Trade Barriers for Developing Countries: Eco-labelling and the Dutch Cut Flower Industry 1995**

Labelling schemes provide information on the environmental efficiency of products or production processes, and/or the environmental impacts of a product's entire life-cycle, including its production, use and disposal. They have been adopted in many countries across different sectors, e.g. energy-efficiency labelling, though are less common in developing countries. Recent years have seen a rapid expansion in voluntary sustainability standards and labelling schemes. One of the fastest growing is private carbon-footprint labels.

## 3.1 How can labelling affect trade?

Private initiatives can have undoubted environmental benefits and can also be supportive of open trade. Private initiatives can respond much faster to market opportunities and trends than official public standards; private standards can help suppliers comply with national and international standards; they often promote best practice and improved productivity, giving brands a better reputation and helping suppliers gain access to markets.

However, labelling can also hinder trade. Concerns have centred on cost, the lack of agreement on methodology, the multiplicity of standards and labels with differing requirements, and the lack of WTO disciplines. Adding a carbon label, for example, is a complex and costly process - 3M, the US corporation, found that a carbon label can cost around $30,000 for a single product.

The proliferation of private labels may have a disproportionate effect on small-scale producers in developing countries.[37] Developing countries also argue that private standards are restrictive and more prescriptive than official public standards.

### Table 3: Examples of Private Standards:

| Individual firm schemes | Collective national schemes | Collective international schemes |
|---|---|---|
| Tesco Nature's Choice | Assured Food Standards-Red Tr | GLOBALGAP |
| Carrefour Filière Qualité | LEAF (Linking Environment and Farming) | PEFC/FSC (sustainable forest certificatio |
| Marks & Spencer Field-to-For | BRC Global Standard – Food | MSC (sustainable fish certification) |
| | RSPCA Freedom Foods | Fairtrade |
| | | International Food Standard (IFS) |
| | | Global Food Safety Initiative (GFSI) |

[37] Conformity assessment procedures are used to determine whether the mandatory and/or voluntary requirements have been fulfilled. Conformity assessments give consumers confidence in the integrity of products, and add value to manufacturers' marketing claims. The key conformity assessment procedures are testing, inspection, certification, accreditation and metrology.

### 3.2 How should the environmental impacts of trade be measured?

There are currently no standard conventions when measuring and reporting the environmental impact of traded products, despite widely used concepts such as 'carbon footprint'. Different carbon footprinting and labelling standards have emerged in different countries, which could pose a barrier to trade. A study by Ernst and Young for the European Commission, for example, found huge variations in carbon footprinting standards across the EU.[38]

While for some products emissions arise mainly during the production process, in the case of others they largely arise in consumption. Supplying information on this can provide extra impetus to cut emissions, but further complicates the calculation and makes agreed standards even more difficult to reach. Another problem is that much of the carbon footprint of a product comes from its components, which are often sourced from a variety of suppliers across the globe. Similarly, in relation to biofuels, the indirect emissions arising from land use changes are a hugely important but highly controversial issue.

The so-called "food mile" label has been particularly controversial as transport costs are just one element of environmental imports. For example, Kenya is a more efficient location for rose production than the Netherlands, as emissions from the more energy intensive Dutch production far exceed the higher transport emissions involved in exporting roses from Kenya.

**Table 4: $CO_2$ emissions from rose production:**

| Supply Chain section | Kenya | Netherlands |
|---|---|---|
| Production | 300 | 36,900 |
| Packaging | 110 | 160 |
| Transport to airport | 18 | 0 |
| Transport to distribution centre | 5,600 | 0 |
| Transport to distribution centre from airport | 5.9 | 50 |
| | | |
| Total | 6,034 | 37,110 |

*Source: ODI (2009); original study by Edwards-Jones and Williams*

[38] Ernst and Young [2010]

### 3.3 Do WTO disciplines cover labelling schemes?

Official international public standards for agricultural produce have been developed by three WTO standard setting bodies[39] to protect plant, animal and food safety, to which all WTO members have signed up. However, since the SPS Agreement does not cover the environmental, social or animal welfare aspects of food production, a range of 'private' or 'voluntary' standards has evolved to fill this gap. Private standards and other voluntary initiatives do not fall directly within the scope of current WTO rules, although there are unresolved questions about whether they can potentially become non-tariff barriers to trade.

The governance of these private standards is complex and has long been an unclear area of WTO jurisprudence[40]. There is an on-going debate over whether and how far WTO rules should cover private standards.[41] Many developed countries, including the EU, view voluntary standards as a legitimate private-sector activity outside the influence of government. Others, mainly developing countries, insist that WTO Agreements make governments responsible for the standards set by their private sectors.

## 4. Other issues - biofuels, rare earths and fossil fuel subsidies

There are a number of specific trade and environmental issues that are particularly topical - biofuels, fossil fuel subsidies and raw materials. These are discussed briefly here.

### 4.1 Biofuels

Biofuels provide only around 3.5% of total UK transport fuel today, but new technologies offer considerable potential for growth. The IEA for example suggests that by 2050 biofuels could account for 27% of world transport fuel[42].

Biofuels trade has been growing as a result of increasing and volatile oil prices, as well as domestic policies aimed at promoting biofuels. Trade will become increasingly important to promote biofuel production and meet

[39] The relevant international public standard bodies are: the Codex Alimentarius Commission for food safety, the World Organisation on Animal Health (OIE), and the International Plant Protection Convention (IPPC) for plant health. These bodies are officially recognised by the WTO and its members under the WTO Sanitary and Phytosanitary (SPS) Agreement.

[40] These areas are partly addressed by the Technical Barriers to Trade (TBT) Agreement covers all areas outside of the SPS Agreement ensuring that regulations, standards, testing and certification procedures do not create unnecessary obstacles to trade. Countries are encouraged to adopt international standards whenever possible but the agreement recognises their right to adopt measures to the extent they consider appropriate (e.g. for human, animal or plant health, protection of the environment).

[41] WTO and UNEP (1998), p103 looks at climate change/ environmental issues and WTO rules.

[42] IEA Roadmap

blending mandates, such as the EU's Renewable Energy Directive[43], as well as to balance demand and supply fluctuations among different regions. Although biomass and biofuel markets have globalised over the last decades, they face barriers such as tariffs that need to be reduced to create stable market conditions.

Biofuel tariffs are likely to prove difficult to liberalise, partly because of their agricultural origins and partly because production is still in its infancy in many countries. Current EU tariffs on biodiesel are up to 10%, bioethanol up to 40%[44] - significantly higher than most of the EU's tariffs on other goods. Many other biofuel markets are protected or national producers subsidised. Improving market access for biofuels is of high importance to developing and emerging economies and so this is likely to prove a controversial area for any future negotiations.

Despite their mitigation potential, the overall sustainability of biofuels remains controversial due to possible land use and food security impacts. While the EU is introducing mandatory sustainability standards, such safeguards are not generally seen internationally. Liberalisation could result in an increase in unsustainable biofuel use globally. A key policy objective is therefore to continue to develop internationally agreed sustainability criteria. There has been some progress towards this in recent years.[45]

## 4.2 Fossil fuel subsidies and trade

Despite unilateral efforts to reduce them, subsidies on both production and consumption of fossil fuels remain widespread. A number of studies suggest removing or reducing these subsidies would bring a substantial reduction in CO2 emissions.

Some see this as essentially a trade policy issue, and argue for it to be tackled as such. In particular there have been calls for greater WTO disciplines on fossil fuel subsidies. The WTO does offer a regulatory framework for addressing certain types of trade distorting subsidies. However, while some energy subsidies may fall under the scope of WTO rules, many do not. Similarly, while WTO members are obliged to submit regular notifications of subsidies, this requirement covers only a portion of all energy subsidies. Moreover, in the past, many WTO members have been slow to meet their reporting obligations.

Some organisations have argued for an extension of the number and types of subsidy subject to control by the WTO agreements. They have also emphasised the importance of greater transparency, pointing to the need to improve notifications to the WTO.

[43] The EU's Renewable Energy Directive (RED) includes a 10% target for the use of renewable energy in road transport fuels by 2020. It also includes environmental sustainability criteria that biofuels consumed in the EU have to comply with.
[44] WITS database
[45] A set of sustainability indicators have been developed by the Global Bioenergy Partnership (GBEP) and these were recently agreed at international level by governments and international institutions. However, the indicators have yet to be piloted prior to implementation, so it remains to be seen whether they will be effective.

The DDA included negotiations aimed at strengthening multilateral disciplines on trade distorting subsidies, and the EU and other members, pressed for improvements in the existing notification mechanisms. Little progress was made.

As the WTO agreements covers only some energy subsidies, effective efforts to improve transparency need to take place outside the WTO, as well as within it. One example of a major initiative in these areas is the Global Subsidies Initiative (GSI), a collaborative effort by the International Institute for Sustainable Development (IISD) and the Earth Council, which undertakes research and disseminates information on the scale and incidence of fossil fuel subsidies[46].

Work commissioned by G20 leaders resulted in an analysis of energy subsidies by the OECD, IEA, OPEC and World Bank being presented to the G20 Summit in Toronto (June 2010).[47] Further reports on the scope of fossil fuel subsidies and a roadmap for phasing them out was prepared for the subsequent G20 Summit in Korea (Nov 2010). [48]

### 4.3 Raw materials and rare earths

The supply of raw materials is of increasing concern to trade policy makers. Some producer countries to constrain exports to (ostensibly at least) limit the environmental impacts of production and prevent depletion. The European Commission has noted the increasing number of export restrictions in the 'rare earths' market,[49] and has challenged a number of other Chinese restrictions in the WTO.

Ironically, these restrictions could exacerbate environmental problems. By inflating prices of rare earths and increasing uncertainty of supply, this could affect the production of low carbon goods as some of these metals are vital for a range of low carbon technologies including solar PV, wind turbines and electric vehicles. Significantly, a recent WTO ruling – subject to any appeal by China - found that China had violated international trade rules by restricting exports of nine raw materials, and refuted Chinese claims that these restrictions were justified on environmental grounds[50].

As part of the Raw Materials Initiative,[51] the EU identified 14 critical materials perceived at risk because of supply shortages and their impacts on the economy being higher when compared to most of the other raw materials.

[46] http://www.globalsubsidies.org/research/fossil-fuel-subsidies
[47] http://www.oecd.org/dataoecd/55/5/45575666.pdf;
[48] http://www.oecd.org/dataoecd/8/43/46575783.pdf.
[49] See European Commission (2010) for a discussion of raw materials and export restrictions on rare earths
[50] The WTO ruling on 5th July 2011: http://www.wto.org/english/news_e/news11_e/394_395_398r_e.htm
[51] See http://ec.europa.eu/enterprise/policies/raw-materials/index_en.htm

Research for Defra[52] has also looked at the risks to UK business and companies' views, covering both renewable and non-renewable resources.

## 5. Conclusions

Trade policy and environmental policy interact in a number of different areas. Trade liberalisation can play a vital role in addressing climate change and sustainability concerns. Moving to a more resource efficient economy also offers opportunities for trade, including UK exporters. But there is also scope for conflicts. In such cases, some see the imposition of trade restrictions as the easy option. However, there are good reasons to believe that such restrictions will not be effective and will impose major costs.

Evidence and experience suggest that the interactions are set to grow and become more complex. As this happens, it will be all the more important to explore all possible policy options for resolving such conflicts, to provide better information on the environmental impacts of economic activity and to continue to harness the benefits of trade liberalisation to further environmental objectives.

[52] Defra (2010) 'Review of the Future Resource Risks Faced by Business and an Assessment of Future Viability' http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=17161&FromSearch=Y&Publisher=1&SearchText=0458&SortString=ProjectCode&SortOrder=Asc&Paging=10

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