



United Nations Environment Programme



WORLD TRADE ORGANIZATION

# Trade and Climate Change

A report by the World Trade Organization  
and the United Nations Environment Programme

## Abstract



This Report provides an overview of the key linkages between trade and climate change based on a review of available literature and a survey of relevant national policies.

The Report begins with a summary of the **current state of scientific knowledge** on existing and projected climate change; on the impacts associated with climate change; and on the available options for responding, through mitigation and adaptation, to the challenges posed by climate change. The Report highlights that the scientific evidence regarding climate change is compelling. Based on a review of thousands of scientific publications, the Intergovernmental Panel on Climate Change has concluded that the warming of the Earth's climate system is “unequivocal”, and that human activities are “very likely” the cause of this warming.

Most worrying, however, is that global greenhouse gas emission levels are still growing, and are projected to

continue growing over the coming decades unless there are significant changes to current laws, policies and actions. Current estimates indicate that greenhouse gas emissions will increase by between 25 and 90 per cent in the period from 2000 to 2030, with the proportion of greenhouse gases emitted by developing countries becoming significantly larger in the coming decades.

Most sectors of the global economy are expected to be affected by climate change and these impacts will often have implications for trade. Many of the sectors impacted, such as agriculture, forestry, fisheries and tourism, are critical for developing countries. Climate change is likely to alter the comparative advantage of these countries in such sectors, and thereby alter the pattern of international trade. Moreover, climate change is expected to have an impact on trade infrastructure and transportation routes. By the same token, trade may provide a means to bridge differences in demand and supply, so that countries where climate change creates

scarcity are able to meet their needs by importing from countries where these goods and services continue to be available.

The scientific review of climate change is followed by an analysis of the **economic aspects of the link between trade and climate change**, and these two parts set the context for the subsequent discussion in the Report, which considers in greater detail trade and climate change policies at both the international and national level. In analysing the links between trade and climate change, economists have used an analytical framework to assess the effects of trade on the amount of greenhouse gas emissions. Three such effects are envisaged: scale, composition and technique effects. On one hand, the literature indicates that freer trade is likely to increase CO<sub>2</sub> emissions as a result of increased economic activity (the scale effect). On the other hand, trade opening could facilitate both the adoption of technologies that reduce the emission-intensity of goods and their production process (technique effect) and the change in the mix of a country's production from energy-intensive sectors towards less energy-intensive sectors if it is where it has a comparative advantage (composition effect). By increasing the diffusion of mitigation technologies, the technique effect represents the principal way in which trade liberalization can help mitigate climate change..

The Report also notes that international trade involves emissions of greenhouse gases through the transportation of goods. In fact, maritime transport accounts for the bulk of international trade by volume and for a significant share by value. Among the different modes of transport, shipping is the most carbon-emission efficient, and this should be taken into account when assessing the contribution of trade to transport-related emissions.

The Report also describes **multilateral efforts at reducing greenhouse gas emissions** and adapting to

the risks posed by climate change. Adopted in 1992 at the Earth Summit, the United Nations Framework Convention on Climate Change (UNFCCC) seeks the stabilization of greenhouse gases in the atmosphere at a level that would prevent dangerous human interference with the climate system. In 1997, increased political momentum led to the signing of the Kyoto Protocol, which establishes specific and binding emission reduction commitments for industrialized countries. The challenge now facing climate change negotiators is to agree on a multilateral response to climate change after the Kyoto Protocol's first commitment period has expired.

In the context of the ongoing WTO Doha Round of negotiations, some multilateral work is also taking place that could contribute positively to mitigation efforts. Of key importance are the first-ever multilateral trade and environment negotiations. WTO members are focusing on ways of further strengthening cooperation and coherence between the WTO and multilateral environmental agreements, such as the UNFCCC. Moreover, negotiators are working on "the reduction, or as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services". The objective is to improve access to more efficient, diverse and less expensive environmental goods and services on the global market, including goods and services that contribute to climate change mitigation and adaptation.

The final part of the Report gives an overview of a range of **national policies and measures** that have been used in a number of countries to reduce greenhouse gas emissions and to increase energy efficiency. It presents key features in the design and implementation of these policies in order to draw a clearer picture of their overall effect and potential impact on environmental protection, sustainable development and trade. It also gives, where appropriate, an overview of the WTO rules that may be relevant to such measures.

A number of policy measures have been used or are available at the national level to mitigate climate change. They are typically distinguished as either regulatory measures (i.e. regulations and standards) or economic incentives (e.g. taxes, tradable permits, and subsidies). The range of climate policy measures that are in place or that are currently being considered are described according to their key objectives: internalization of the environmental costs of greenhouse gas emissions; regulation of the use of climate-friendly goods and technologies; or the development and deployment of such goods. These distinctions also provide a useful framework for considering the potential relevance of trade rules.

Two types of pricing mechanisms have been used to reduce greenhouse gas emissions: taxes and cap-and-trade systems. Such pricing tools aim at internalising the environmental externality (i.e. climate change) by setting a price on the carbon content of energy consumed or on the CO<sub>2</sub> emissions generated in the production and/or consumption of goods. The approach taken by several countries over the last two decades has been to put a price on the introduction of CO<sub>2</sub> into the atmosphere by imposing taxes on the consumption of fossil fuels according to their level of carbon content. A number of countries have also introduced general taxes on the consumption of energy, which has a de facto effect on CO<sub>2</sub> emissions or a combination of tax on CO<sub>2</sub> emissions and tax on energy use.

Another approach to setting a carbon price is to fix a cap on total emissions, translate this into allowances to cover those emissions, and create a market to trade these allowances at a price determined by the market. The development of the emission trading scheme in Europe, and proposals for the introduction of mandatory emission trading schemes in other developed economies has given rise to a considerable amount of debate. Of particular concern has been the extent to which the international competitiveness of energy-

intensive industrial sectors will be affected by carbon-constraining domestic policies. In this context, the issue of “carbon leakage” (in other words, the risk that energy-intensive industries will simply relocate to countries without climate regulations) has also recently received a great deal of attention. Indeed, in their legislation on emission trading schemes, some countries are debating or have already introduced criteria – such as the carbon or energy intensity of production processes or the trade exposure of the industry concerned – to identify sectors that would be at risk of carbon leakage.

Therefore, a number of carbon cost-reducing features for some energy-intensive industries, such as free allocation of emission allowances and exemptions for particularly sensitive industries, have been discussed. However, alleviations and exemptions may not be sufficient and the question that then arises is whether concerns over carbon leakage and competitiveness can justify governmental measures that impose similar costs on foreign producers, through the use of border adjustment measures.

There are two main challenges in implementing border measures: providing a clear rationale for border measures (i.e. accurately assessing carbon leakage and competitiveness losses); and determining a “fair” price to be imposed on imported products to bring their prices into line with the domestic cost of compliance with an emission trading scheme. Discussions of such measures so far have highlighted the difficulty in implementing a border adjustment mechanism that responds to the concerns of domestic industries while still contributing to the wider goal of global climate change mitigation.

Detailed rules on border tax adjustments (BTAs) exist in the General Agreement on Tariffs and Trade (GATT) and the WTO Agreement on Subsidies and Countervailing Measures (SCM). These rules permit, under certain conditions, the use of BTAs on imported

and exported products. Although border adjustments in connection with emission trading schemes are a new form of regulation, and as such are not explicitly foreseen in the text of the WTO agreements, core trade disciplines such as the non-discrimination principle may come into play as their scope of application is fairly broad.

The general approach under WTO rules has been to acknowledge that some degree of trade restriction may be necessary to achieve certain policy objectives as long as a number of carefully crafted conditions are respected. WTO case law has confirmed that WTO rules do not trump environmental requirements. If, for instance, a border measure related to climate change was found to be inconsistent with one of the core provisions of the GATT, its justification might nonetheless be sought under the general exceptions to the GATT (i.e. Article XX), provided that several conditions are met.

This part of the Report also reviews another type of economic incentive which is commonly used in climate change mitigation policies: governmental funding aimed at fostering research and development of climate-friendly goods and technologies and increasing their deployment (including their commercialization and diffusion). Three types of financial incentives for deployment are discussed: fiscal instruments; price support measures, such as feed-in tariffs; and investment support policies, which aim to reduce the capital cost of installing and deploying renewable energy technologies.

Governmental financing for the development and deployment of renewable energy and low-carbon goods may have an impact on the price and production of such goods. From an international trade perspective, such policies lower the costs of producers, leading to lower product prices. In turn, lower prices may reduce exporting countries' access to the market of

the subsidizing country, or may result in increased exports from the subsidizing country. Moreover, some countries may provide domestic energy-intensive industries with subsidies to offset the costs of installing emission-reducing technologies and thus to maintain their international competitiveness. Since the sector of renewable energy and low-carbon technologies is significantly open to international trade, the WTO rules on subsidies (as contained in the SCM Agreement) may become relevant for certain financing policies.

Finally, the Report considers more traditional regulatory tools and reviews the range of technical requirements for products and production methods aimed at reducing greenhouse gas emissions and energy consumption. Technical requirements to promote energy efficiency have been adopted at the national level by most developed countries, and by a growing number of developing countries. It is estimated that energy-efficiency improvements have resulted in reductions in energy consumption of more than 50 per cent over the last 30 years.

Such climate change related technical requirements may take various forms (e.g. maximum levels of emissions, standards for energy efficiency for both products and production methods, etc.). Moreover, such requirements are accompanied by implementation and enforcement measures, such as labelling requirements and conformity assessment procedures to ensure transparency and conformity with the relevant energy efficiency and CO<sub>2</sub> emissions reduction requirements. The Technical Barriers to Trade Agreement is the key WTO mechanism for governing technical regulations, standards and conformity assessment procedures, including those on climate change mitigation objectives, although other GATT rules may also be relevant.