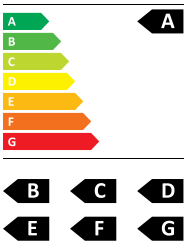
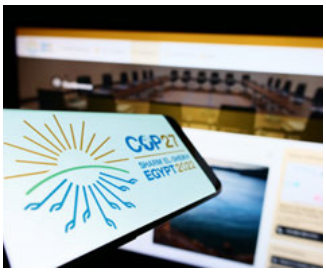
UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Making trade work for climate change mitigation: The case of technical regulations





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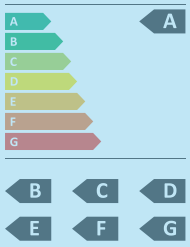

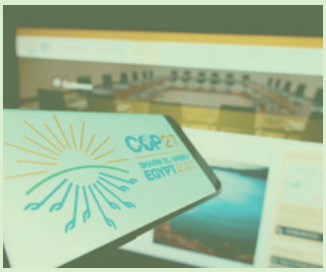

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Abbreviations and acronyms

CBAM	Carbon border adjustment mechanism
GATT	General Agreement on Tariffs and Trade
GHG	Greenhouse gas
ICC	International Code Council
IEC	International Electrotechnical Commission
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
MFN	Most-favoured nation
NDCs	Nationally determined contributions
NMA	Non-market approach
NTM	Non-tariff measure
PPM	Process and production method
SDG	Sustainable Development Goal
SDT	Special and differential treatment
SMEs	Small and medium size enterprises
STCs	Specific trade concerns
TBT	Technical barriers to trade
TESSD	Trade and Environmental Sustainability Structured Discussions
TRAINS	Trade Analysis Information System
UNFCCC	United Nations Framework Convention on Climate Change
WTO	World Trade Organization

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Executive summary

Over 190 United Nations Member States pledged to reduce greenhouse gas (GHG) emissions to limit the increase in global temperatures to "well below" 2°C under the Paris Agreement reached in 2015.

A quarter of global CO_2 emissions is linked to the production and distribution of traded goods and services (World Bank, 2021)**. Trade regulations can play an important role in supporting the transition towards a low-carbon economy.**

Over the last few decades, countries have been increasingly using non-tariff measures (NTMs) to pursue environmental and climate-change mitigation objectives. NTMs are policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, prices or both. Climate change related NTMs are commonly imposed on goods such as fuel, motor vehicles, appliances, renewable energy generation equipment, and plastic products. Given their potential impact on trade and competitiveness, they should be carefully designed and implemented to ensure their compatibility with international law, and to allow equitable market access for developing countries.

A mapping of climate change-related NTMs identified over a thousand NTMs introduced by about 100 countries. These measures sought to achieve five main regulatory objectives:

1. Reduce the emission of GHG from goods (including through the adoption of regulations on cars, fossil fuel and biofuel).
2. Impose energy efficiency requirement on appliances.
3. Prevent deforestation and promote sustainable forest management.
4. Ensure the quality and reliability of renewable energy production equipment.
5. Restrict the use of plastics.

Technical barriers to trade (TBTs) account for a large majority of climate change-related NTMs. Technical barriers to trade (TBTs) comprise technical regulations and their related conformity assessment procedures. Technical regulations can be defined as "a document that sets out product characteristics or related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory" (UNCTAD, 2019). Climate change-related TBTs aim to decrease GHGs emissions directly or indirectly arising from the production, use and disposal of domestically produced and imported goods. They most frequently take the form of performance requirements (emission limits, energy efficiency requirements), labelling requirements, and conformity assessments (testing, certification).

The international legal framework relevant for climate change related NTMs comprises both international climate change and international trade law. Policy makers and regulators must take these two bodies of law into account, and understand their linkages when designing technical regulations, conformity assessments and mandatory labelling schemes.

International climate change law – most notably the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement – **gives countries the freedom to choose the measures they use to attain their environmental targets.** Therefore, conflicts on climate change-related technical regulations do not arise between international trade and international climate change law, but rather between international trade rules and domestic policies and measures, as the latter can result in the discrimination of foreign products or be a disguised restriction on international trade.

The key WTO agreements governing climate change-related NTMs are the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO) TBT Agreements. GATT Articles I (Most-favoured nation) and III (National Treatment) require WTO Members not to discriminate against foreign products in favour of 'like' products from a third State or 'like' domestic products. The GATT Article XX contains a list of general exceptions that allow WTO Members to derogate from a GATT provision under certain conditions. It has been relied upon to justify measures adopted for environmental or public health reasons and has been used by WTO's jurisdiction in relation to climate change.

The TBT Agreement aims to ensure that technical regulations do not create unnecessary obstacles to trade. It governs the preparation, adoption and application of technical regulations, standards, and conformity assessment procedures. Particularly relevant in the context of climate change are the following provisions of the agreement:

1. The TBT Agreement recognizes members' right to adopt the regulations and standards they consider appropriate, for the protection of the environment and climate change mitigation.

2. These regulations should not lead to less favourable treatment for imported products compared to 'like' products produced in another country or domestically.

3. Technical regulations should not be more trade-restrictive than is necessary to fulfil their legitimate objective. Therefore, when adopting a climate change related technical regulation, Policy makers should ensure that other less trade-restrictive alternatives that would allow to achieve an equivalent result are considered but excluded because they are too costly, burdensome, not technically feasible or simply not available. The TBT Agreement prefers performance-based regulations over those based on design or descriptive characteristics.

4. A crucial issue for the design, environmental impact, and equity of climate change related technical regulations is the treatment of processes and production methods (PPMs).

   PPMs address the way in which a product is produced (*i.e.,* by introducing GHG emission limits) and can contribute significantly to emissions reduction. PPMs can be of two types: Product-related (when the PPM leaves a trace, an effect or is detectable in the final product) and non-product-related (when the PPM does not leave any trace and is not detectable in the final product). Clarifying whether the regulation of non-product-related PPMs fall under the scope of the TBT Agreement is extremely relevant for climate change mitigation. It should be noted that, if a measure based on non-product-related PPMs is found not to fall under the scope of the TBT Agreement, it might still be justifiable under GATT Article XX (General Exceptions).

   Another important question linked to PPMs is whether similar goods could be considered `unlike' products and face a different treatment if produced with a different emission intensity, energy intensity or energy source. A positive reply would mean that a country may be allowed to favour a product based on the carbon footprint of its production process. So far, substitutable products found to be competing on the same market tend to be considered 'like' products and must be treated equally. In the future, proving that the carbon footprint of a production process significantly impacts the demand could be an important argument to justify a possible difference of treatment between two similar goods.

5. Where relevant international standards exist, WTO Members should base their technical regulations on these standards unless they would be ineffective or inappropriate to fulfil their objective (*e.g.*, reducing GHG emissions from a specific set of products). Regulations based on international standards are regarded as the least trade-restrictive and have the potential to be more equitable towards developing countries, especially if the latter are closely involved in the definition of these standards. The importance of international standards agreed by consensus in facilitating the transition to low carbon economies and in avoiding obstacles to trade, has been recently highlighted by the WTO.

Climate change-related technical regulations are generally seen as facing less political constraints when compared with other measures such as carbon taxes. They might also be easier to implement in developing countries than carbon pricing mechanisms. Despite their greater acceptability and generalizability, the lack of harmonization of technical regulations and standards results in increased information and compliance costs, which can hinder developing countries' competitiveness and market access. A greater level of harmonization of climate change related technical regulations and their alignment on common standards can help alleviate this problem

The United Nations Framework Convention on Climate Change recognizes that measures taken by developed countries to mitigate climate change could negatively impact developing economies and impede sustainable development efforts. It also provides a set of guiding principles to mitigate these impacts. These principles call among others for the consideration of the special circumstances and needs of developing countries, and the provision of technical and financial support to minimize negative impacts.

Enhancing developing countries' capacity to adopt and comply with climate change-related technical regulations is crucial for the global uptake of carbon efficient products and the equity of technologies.

Special and differential treatment in favour of developing countries is also embedded across the various agreements of the WTO. These provisions are meant to create additional equity and fairness accounting for the challenges faced by developing countries. The TBT Agreement, for example, declares that "developing countries may encounter special difficulties" and that WTO Members desire "to assist them in their endeavours in this regard".

Based on the legal and technical analysis presented in this report, the following recommendations to promote the effectiveness, efficiency, and legal clarity of climate change related TBTs are made:

Recommendation 1. A task force should be created to support information collection and transparency on climate change related TBTs. UNCTAD's NTM platform could be used to support the proposed effort. The WTO TBT Committee should play a central role.

Recommendation 2. Dialogue among developed and developing countries' policymakers on climate change-related TBTs should be fostered, especially for the identification of shared priorities for the adoption of relevant climate change-related standards or technical regulations.

Recommendation 3. Technical support and capacity building should be provided to developing countries for the joint formulation, adoption and implementation of climate change-related technical regulations and standards.

Recommendation 4. Climate change-related technical regulations, conformity assessment procedures and international standards should reflect the context, needs and challenges of developing countries. Such emphasis will positively impact the effectiveness, cost-efficiency, and level of political support of and for future measures.

Recommendation 5. Technical regulations should be, whenever possible, based on performance rather than design or descriptive characteristics, and international standards.

Due to the complexity and diversity of NTMs, comprehensive and comparable data is a constraint for empirical analysis. While information on tariffs is available through centralized sources, NTM data is generated through WTO notifications or country mappings of a variety of national sources. With its NTMs transparency initiative and TRAINS database, UNCTAD has developed a globally harmonized NTM collection approach and coordinates a global effort that has led to the availability of NTM data for more than 100 countries covering over 90 per cent of global trade in goods (UNCTAD NTM hub: unctad.org/ntm).

1 Introduction

1. Introduction

International trade and climate change law are two distinct realms that inevitably and increasingly interact with each other. Climate change law instruments – in particular, the UNFCCC and the Paris Agreement – constitute the legal framework within which States set emissions reduction targets and adopt climate mitigation measures to achieve the global target of limiting the increase in global average temperatures to "well below" 2°C. This legal framework leaves countries free to decide which measures they employ to achieve their targets. However, international trade law – and, in particular, the rules and principles of the WTO – determines when and how States can adopt a measure which potentially impacts international trade, even if such a measure is primarily aimed at tackling climate change.

With a quarter of global CO_2 emissions directly or indirectly linked to the production and distribution of traded goods and services (World Bank, 2021)**, trade-related measures can play an important role in promoting climate change mitigation and adaptation.** The other commonly considered approach to mitigating climate change, GHG emission pricing, is only slowly being implemented and often appears less politically acceptable or practical. Climate change related trade measures have a significant potential of reducing GHG emissions and are increasingly being adopted. Recent discussions on combustion engine bans or carbon border adjustments have highlighted the far-reaching implications of these instruments. It is becoming increasingly crucial to ensure their compatibility with international law while also effectively allowing equitable market access for developing countries.

This report provides an analysis of the most relevant and most used trade related measures in the context of climate change mitigation strategies, assesses the challenge of increasing their compatibility with international trade law, and discusses the effectiveness, feasibility, and equity of these measures, focusing, in particular, on developing countries.

1.1. The role of trade measures in addressing climate change

The international climate change legal framework leaves countries free to decide which specific measures and policies to adopt to meet their emissions reduction targets. The UNFCCC requires industrialized countries and economies in transition (Annex I Parties) to "adopt national policies and take corresponding measures on the mitigation of climate change, by limiting [their] anthropogenic emissions of greenhouse gases and protecting and enhancing [their] greenhouse gas sinks and reservoirs." (Article 4.2(a)).[1]

The 1997 Kyoto Protocol distinguished between Annex I and Non-Annex I countries, requiring only Annex I countries to reduce their emissions.[2] However, although national emission reduction targets were established in the Kyoto Protocol itself, it was left up to each individual country to choose which specific measures to adopt to meet their Kyoto Protocol target.

UNFCCC and Kyoto Protocol are built upon the principle of "common but differentiated responsibility" with regards to the allocation of GHG emission reduction obligations between developed and developing countries. Enshrined in Principle 7 of the Rio Declaration, the common but differentiated responsibility principle acknowledges that developed countries bear a responsibility "in the international pursuit to sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command". This principle was later included among the guiding principles for the implementation of the UNFCCC: "The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of

equity and in accordance with their common but differentiated responsibilities and respective capabilities". (Article 3.1)

The 2015 Paris Agreement eliminated the distinction between groups of countries and let each State Party define their own targets. This marked a significant evolution in the application of the common but differentiated responsibility principle, and potentially creates a single regime for climate change-related trade measures. The agreement adopted an approach that has often been defined as 'bottom-up', whereby each country is free to choose both its emission reduction target and the measures it will adopt to meet its so-called nationally determined contributions (NDCs).[3] Under the Paris Agreement, State Parties are only required to (i) set and communicate their target; (ii) revisit their target every five years; and (iii) refrain from lowering their target at each revision.[4]

The adoption of action plans on clean energy and climate-friendly technologies, which incorporate trade-related measures, has become quite common in NDCs. Some countries have even incorporated climate change within their trade policy frameworks. Table 1 offers a few examples of such measures.

Table 1.
Examples of trade measures included in countries' nationally determined contributions

Type of measure	Measures indicated in nationally determined contributions
Taxes	Tax for Climate Change Mitigation (Japan)
	Carbon Border Adjustment Mechanism (European Union)
Market-based mechanisms	Participation in carbon markets (Panama)
	Emission Trading Scheme (European Union, Switzerland)
Technical regulation and standards	Renewable fuel regulations (Canada)
	Import ban on vehicles older than 3 years (Gabon)
	Establishment of efficiency standards for the importation of all vehicles and appliances (Antigua and Barbuda)
	Issue national standards to ensure the quality of energy-saving equipment (Viet Nam)
Subsidies	State-level Renewable Portfolio Standards (United States of America)
	Removal of fossil fuel subsidies (Ethiopia)
	Feed-in tariffs (selected European Union Members and Switzerland)

Source: Table compiled by the authors on the basis of national NDCs communicated to the UNFCCC Secretariat.

Trade related measures can play a significant role in climate change mitigation, adaptation, and resilience-building.[5] The United Nations 2030 Agenda for Sustainable Development identifies trade measures as an important tool to support the achievement of many of the 17 Sustainable Development Goals (SDGs) and foster transitions to a greener and more resilient economy. The Intergovernmental Panel on Climate Change (IPCC) has similarly stated that policies and instruments that can create incentives for mitigation actions include "regulations and standards, taxes and charges, tradable permits, financial incentives…" (IPCC, 2007) Trade related measures can contribute to States' efforts to "accelerate the

development, deployment and dissemination of technologies, and the adoption of policies, to transition towards low-emission energy systems, including by rapidly scaling up the deployment of clean power generation and energy efficiency measures…" as indicated in the 2021 Glasgow Climate Pact.

The multilateral trade law under WTO auspices recognizes sustainable development and the protection of the environment as an overarching objective, thus paving the way for the adoption of WTO compliant trade measures addressing climate change. The Preamble to the Marrakesh Agreement Establishing the World Trade Organization in 1995 states that "their relations in the field of trade and economic endeavour should be conducted with a view to raising standards of living, [...], while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development."

Trade related measures can be divided into tariff and non-tariff measures (NTMs). NTMs include a broad array of trade control instruments such as licenses, quotas, price control measures and finance measures as well as technical regulations.

As technical NTMs can regulate product characteristics, production processes and import conditions, they are often adopted for environmental protection purposes (UNCTAD, 2022). Research conducted for the preparation of the present report confirms the adoption of a significant number of NTMs to curb global GHG emissions (UNCTAD, 2018). The widespread use and environmental effectiveness of NTMs has also been underlined by the IPCC, which pointed out the contribution of technical regulations to mitigation efforts in areas such as energy efficiency, consumer information (labelling), fuel standards and low emission industrial materials (IPCC, 2014 and 2022). Technical regulations generally set requirements that producers and retailers have to comply with in order to sell certain products on a given market. As such, they can be used to support the adoption of energy efficient technologies and the consumption of low carbon products by domestic consumers.

Other climate-related purposes of NTMs can be to incentivize trade partners to adopt domestic climate change mitigation measures, for example by introducing Carbon Border Adjustment Mechanisms (CBAMs). Another important purpose is the removal of disincentives to climate action, such as the loss of competitive advantage producers may face if their home State adopts climate laws or policies that are more stringent. Regulations on certain product characteristics, such as energy efficiency, generally serve this purpose (Epps and Green, 2011).

Due to the complexity and diversity of NTMs, comprehensive and comparable data is a bottleneck for analysis. While information on tariffs is available through centralized sources, NTM data is generally generated through WTO notifications or country mappings of a variety of national sources. With its NTMs transparency initiative and its TRAINS database (a global online information portal on NTMs), UNCTAD has developed a globally harmonized NTM data collection approach and has coordinated a global effort which has led to the availability of NTM data for more than 100 countries covering over 90 per cent of global trade in goods (UNCTAD NTM hub unctad.org/ntm). Previous analytical work conducted in partnership with ESCAP has highlighted the close relationship between NTMs and SDGs (United Nations ESCAP and UNCTAD, 2019). This report represents a first effort to bring further clarity on the use of climate change-related NTMs.

1.2. Ensuring the compliance of climate change related non-tariff measures with international trade law

Despite their important contribution to climate change mitigation, NTMs can have far reaching impacts on competitiveness and market access, especially for developing countries (*e.g.*, UNCTAD and World Bank, 2019). To avoid unnecessary trade restrictions, as well as discriminatory and protectionist practices, WTO law sets out a detailed set of rules and obligations that members must adhere to when designing and adopting such measures. The imperative for climate action to minimize unjustified trade distortions is also enshrined in Climate Law. According to Article 3.5 of the UNFCCC, for instance, "[m]easures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade." Along the same lines, Article 2.3 of the Kyoto Protocol requires Annex I Parties to "strive to implement policies and measures under this Article in such a way as to minimize adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties…".

It follows that measures adopted at the national level risk colliding with international trade rules. As explained by the IPCC in its latest 2022 Report, "trade rules have the potential to stimulate international adoption of mitigation technologies and policies but may also limit countries' ability to adopt trade-related climate policies." (IPCC, 2022)

For these reasons, international trade rules need to be discussed and evaluated "with a view to their potential of supporting climate policy without compromising trade." (Dröge *et al.,* 2018)

1.3. Purpose and structure of the report

This report provides an analysis of the most relevant and most used trade related regulations in the context of climate change mitigation strategies, with a particular focus on technical barriers to trade (TBTs).[6] As this report will show, climate change-related trade regulations have largely been adopted by States because of their environmental effectiveness. However, they present a number of challenges under WTO law, as they might be considered trade restrictive or discriminatory. Whether or not they actually are will depend on their design and the manner of implementation. Following this introduction (Section 1), **the report reviews the main trade related regulations used to address climate change mitigation** (Section 2)**; analyses the international trade law framework applicable to these measures, focusing in particular on WTO agreements and jurisprudence** (Section 3)**; discusses the effectiveness, feasibility and equity of these measures, focusing in particular on the perspective of developing countries** (Section 4)**, and provides a set of recommendations aimed at contributing to the mutual supportiveness between the climate change and the trade regimes** (Section 5)**.**

2 Overview of climate change-related non-tariff measures

2. Overview of climate change-related non-tariff measures

Non-tariff measures are defined as "policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both" (UNCTAD, 2010). Table 2 provides an overview of the chapters of the International Classification of NTMs (UNCTAD, 2019).[7]

Table 2.
Overview of the international classification of non-tariff measures

A	Sanitary and phytosanitary measures
B	Technical barriers to trade
C	Pre-shipment inspection and other formalities
D	Contingent trade-protective measures
E	Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade
F	Price-control measures, including additional taxes and charges
G	Finance measures
H	Measures affecting competition
I	Trade-related investment measures
J	Distribution restrictions
K	Restrictions on post-sales services
L	Subsidies and other forms of support
M	Government procurement restrictions
N	Intellectual property
O	Rules of origin
P	Export-related measures

Source: UNCTAD, *2019.*

An exploratory mapping of climate change-related NTMs was conducted by UNCTAD in collaboration with United Nations ESCAP to inform the preparation of this report. The mapping led to the identification through the UNCTAD TRAINS NTMs database of over a thousand NTMs introduced by about 100 developed and developing countries. Detailed statistics on the use of climate change-related NTMs are published in a separate forthcoming report. The following observations are drawn from an analysis of these measures.

First, a significant number of climate change-related NTMs have been adopted by countries with the following regulatory objectives:

- Reduce the emission of GHG from traded goods (including through the adoption of regulations on cars, fossil fuel and biofuel).
- Impose energy efficiency requirement on appliances.
- Prevent deforestation and promote sustainable forest management.
- Ensure the quality and reliability of renewable energy production equipment.
- Restrict the use of plastics.

Table 3 provides illustrations of NTMs adopted by countries to meet these objectives.

Table 3.
Examples of climate change-related non-tariff measures

Reducing the emission of greenhouse gases from traded goods
Import and export ban of equipment or products containing Chlorofluorocarbons; Bromochlorofluorocarbons; Halons (South Africa)
Mandatory quality standard and quality inspection of imported biofuel (Viet Nam)
Mandatory CO_2 emission standard for locomotives and locomotive engines (United States of America)
Impose energy efficiency requirement on appliances
Ecodesign requirements (including minimum energy efficiency and maximum power consumption in standby and switched-off modes) for domestically produced and imported air conditioners and comfort fans (China)
Ecodesign requirements related to mandatory energy efficiency index limits for household refrigerating appliances (European Union)
Prevent deforestation and promote sustainable forest management
Reexport prohibition on timber forest products from natural forests or forest plantations that do not comply with sustainable management standards and traceability rules (Togo)
Ensure the quality and reliability of renewable energy production equipment
Mandatory standard laying down requirements and markings for the design qualification and type approval of terrestrial, thin-film photovoltaic modules suitable for long term operation in general open-air climates (Uganda)
Restrict the use of plastics
Ban on the import, manufacture and use of a list of non-degradable plastic products (Pakistan)

Second, TBTs account for a large majority of all identified climate change related NTMs. This finding is consistent with conclusions by the IPCC and with a number of studies pointing out the importance of technical regulations for climate action.[8] Among TBT measures, performance requirements (emission limits, energy efficiency requirements), labelling requirements, and conformity assessments (tests and certification requirements) appear as the most common.

Third, in addition to TBTs, countries have adopted various other types of climate change-related NTMs such as: Pre-shipment inspections; Non-automatic import licensing; Quotas and prohibitions; Price control measures; Finance measures; Measures affecting competition; Trade related investment measures; and Export-related measures. Among these measures, import and export licensing and prohibitions (often for environment protection purposes) appear to be the most prevalent.

In this report, particular consideration will be given to TBTs and their use in the context of climate action.

2.1. Focus on climate change related technical barriers to trade

Technical barriers to trade comprise technical requirements on product characteristics or production methods, as well as related conformity assessment procedures.[9] The Multi-Agency Support Team on NTMs defines technical regulations as "a document that sets out product characteristics or related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory. It may also include or deal exclusively with terminology, symbols,

packaging, marking or labelling requirements as they apply to a product, process or production method." Conformity assessment procedure for its part is defined as "any procedure used, directly or indirectly, to determine whether relevant requirements in technical regulations or standards have been fulfilled; it may include, *inter alia*, procedures for sampling, testing and inspection; evaluation, verification and assurance of conformity; registration, accreditation and approval, as well as their combinations." (UNCTAD, 2019)

Over the last few decades, there has been a steady increase in the adoption and use of technical regulations, labelling schemes and conformity assessment procedures to implement environmental (and climate change mitigation) objectives (Holzer and Lim, 2020). This trend is clearly reflected in the data provided by the WTO's Environmental Database which shows a steady increase in both environment related notifications and climate change-related notifications between 2009 and 2021 along with a predominance of TBT related notification among all notifications received over the period.[10]

Climate change related TBTs aim to decrease GHGs emissions directly or indirectly arising from the production, use and disposal of both domestically produced and imported goods (WTO/UNEP, 2009). They have the potential of shaping both production and consumption patterns in a wide variety of sectors and, at the same time, to alter competition and trade patterns, thus triggering the application of international trade rules (see Section 3).

This part of the report will address technical regulations, labelling schemes and conformity assessment procedures. It provides several concrete examples of technical regulations as well as a preliminary taxonomy which is relevant from an international trade law perspective. It will then discuss in greater detail mandatory labelling schemes, which are often based on said technical regulations and are among the most popular tools used to influence consumers' and producers' behaviour. Lastly, it will analyse various conformity assessment procedures, which are used to ensure that technical regulations are complied with.

2.1.1. Technical regulations

Technical regulations have been used in a wide variety of activities including those related to energy efficiency; forestry/deforestation; transportation and vehicles; renewable energy and biofuels; plastics; and sustainable production schemes.

Technical regulations to promote energy efficiency and reduce emissions levels have been adopted by most developed countries and increasingly by developing countries as well. They are mandatory because market access is conditional on a product's compliance with them. Their mandatory nature sets technical regulations apart from standards, which are instead voluntary. This distinction has significant implications under international trade law.

Climate change-related technical regulations can be classified according to different parameters:

- **First, they can be imposed on either products and/or process and production methods (PPMs).**

  Product-related technical regulations can address the energy efficiency and carbon footprint related to the actual use of a given product, like those that regulate CO_2 emissions levels for cars. Examples include United States of America regulations on air pollution controls (such as those contained in Title 40, Chapter I, Subchapter U of the Code of Federal Regulations – CFR) or the United States of America Medium- and Heavy-Duty Vehicle Fuel Efficiency Program (CFR, Title 49, Part. 535).

Conversely, *PPM-related technical regulations* can *address the energy efficiency and GHG emissions related to the production process of a product, sometimes encompassing its entire lifecycle.* An example is the 2009 European Union Fuel Quality Directive, which required fuel suppliers to reduce the life cycle greenhouse gas intensity of supplied fuels by at least 6 per cent by 2020 compared to 2010 levels (Holzer and Lim, 2020). As Section 3 will show, whether the TBT Agreement regulates PPM-related technical regulations (with an exception for labelling schemes) is still debated (see subsection 3.2.3).

- **Second, technical regulations can be based either on product *characteristics*, or on *performance*.**

  Technical regulations based on design or product characteristics specify the exact characteristics a product must have, or the exact procedures to follow, technologies to install, or materials to use during the production of the product. Technical regulations of this kind have often been used in the regulation of biofuels. Several economies, such as Brazil, India, the European Union, and the United States of America, have developed technical regulations on the quality and specifications of biofuels (WTO/UNEP, 2009).

  Conversely, *performance-based technical regulations specify the environmental outcomes (or standards of performance) that a production process or a product need to deliver, regardless of how those outcomes are achieved.* Performance-based regulations are generally used in the regulation of transport, appliances, and buildings (in particular with regards to energy efficiency). Examples include European Union legislation on carbon standards for new cars according to which car manufacturers' new fleet was required to not emit more than 95 grams of CO_2 per kilometre on average by 2020 (Holzer and Lim, 2020). Another example, once again regarding vehicles, is the United States of America Corporate Average Fuel Economy (CAFE) standards, which are set in miles per gallon (mpg) and correspond to the size of a vehicle. In the context of energy efficiency, examples include: a European Union directive setting a maximum allowable value of electricity consumption for domestic refrigeration appliances; a European Union regulation prescribing ecodesign requirements for minimum energy performance; maximum sound levels and product information for air conditioners and comfort fans sold in the European Union; a South African compulsory specification for incandescent lamps; and a United States of America energy efficiency program for certain commercial and industrial equipment. The performance of a product or process can be set in several ways, such as maximum CO_2 emissions levels, minimum energy performance, minimum fuel economy or maximum energy consumption levels (WTO/UNEP, 2009).

The TBT Agreement prefers performance-based regulations over those based on design or descriptive characteristics and urges WTO Members to "specify technical regulations based on product requirements in terms of performance" (see TBT Article 2.8). In addition to the considerations related to their impact on international trade, performance-based regulations generally provide countries with more flexibility and companies with lower costs, given that they can choose how to achieve a certain environmental outcome. Moreover, by focusing on performance, technical regulations will likely spur technological innovation, since companies are not required to follow the same production process (Mavoridis, 2016). It has been pointed out, on the other hand, that there are certain situations where a technical regulation based on design or descriptive characteristics may be advisable: for instance, when there are only a few options to achieve a certain environmental outcome (*i.e.*, reducing emissions) or there are concerns as to the feasibility and efficiency of other options (WTO/UNEP, 2009).

Climate change related technical regulations, particularly those targeting energy efficiency, have been developed by a growing number of developing countries, as evidenced by their NDCs as well as by the list of TBT notifications.[11] This is a positive development for climate change objectives. If these domestic regulations are well-aligned with trading partners' requirements, they entail no negative effect on trade costs or competitiveness (Knebel and Peters, 2019). However, as Section 4 of this report will show, a series of steps needs to be taken to ensure that developing countries are able to fully participate in climate change related standards setting and are not negatively affected by regulations adopted in developed countries.

The use of international standards is an important element to avoid unnecessary trade frictions. A number of climate change-related international standards can be used as a basis for the adoption of technical regulation (see box 1).

Box 1. Climate change related international standards

International standards are often used as a basis for technical regulations adopted at the national level, and WTO law urges Member States to base their technical regulations on international standards (see Section 3, subsection 3.2.6). In a recent analysis, the WTO highlighted the importance of international standards *agreed by consensus* in facilitating the transition to low carbon economies and in avoiding obstacles to trade (WTO, 2022b).

For the purposes of the TBT Agreement, international standards are those prepared by the 'international standardization community'. The TBT Agreement makes reference only to the International Organization for Standardization (ISO) but the relevant case law has indicated other international standard setting bodies are able to develop 'international standards.' The TBT Agreement provides the necessary criteria for accepted International Standard setting bodies.

Examples of international standards that are relevant for national climate change related technical regulations include standards to **measure energy efficiency**, such as those developed by the ISO to calculate the thermal properties of construction materials, or those developed by the International Electrotechnical Commission (IEC) to measure the efficiency of power conditioners.

International standards can also provide guidance on how to **quantify and report carbon emissions**. Examples include standards ISO 14067:2018 for the quantification of the carbon footprint of products, or ISO 14064-1:2018 for GHG emissions and removal at the organizational level.

Sectoral standards such as those developed by ISO on solar energy, hydrogen and wind technologies, and solid and liquid biofuels (WTO/UNEP, 2009) are another category of international standards of relevance for the adoption of technical regulations.

The importance of climate change related international standards and the legal implications linked to their formulation, adoption and implementation in both developed and developing countries will be further developed in the third and fourth sections of the present report.

2.1.2. Labelling schemes

Mandatory labelling schemes play an important role in promoting energy efficiency, reducing emissions levels and mitigating climate change. Mandatory labels are generally based on technical regulations (or used in conjunction with them) and are employed "to inform consumers about international standards constituted in products, to communicate carbon footprint data and to gauge energy efficiency performance and the level of emission reduction." (Kristy and Monkelbaan, 2015)

By providing consumers with information regarding the environmental impact of a product, or its production process, labels can allow them to make rational purchasing decisions. At the same time, they can influence producers and stimulate them to produce more environmentally friendly products or employ more environmentally friendly production processes in order to reach a wider consumer base.

A more detailed analysis of their effectiveness from an environmental and climate change perspective can be found in Section 4.

They can be either directed at products, like in the case of most labels for domestic appliances and cars, or at PPMs. These labelling schemes can address the product's entire lifecycle, from production to use and disposal (WTO/UNEP, 2009).

Energy-efficiency labels can also be separated into comparative labels and endorsement labels with regards to the way that information is presented. Comparative labels, which are generally mandatory, inform consumers about the energy efficiency of a product by providing a scale that allows them to compare said product with similar products (for example, by providing a rating of 1 to 5 stars). Endorsement labels, which instead are generally voluntary, essentially provide the product with a seal of approval by an independent body assuring the consumers that the product meets certain environmental criteria or meets certain targets (WTO/UNEP, 2009).

2.1.3. Conformity assessment procedures

Conformity assessment procedures are used to verify that the mandatory requirements related to a technical regulation have been met. Their function is to provide consumers with the guarantee that the products or processes in question have a certain expected integrity. The main conformity assessment procedures are testing, inspection and certification.

Testing constitutes the most common procedure to ensure the compliance of traded goods with climate change related technical regulations. It is also the conformity assessment procedure which requires the most developed quality infrastructure. Climate change-related testing procedures can involve the provision of extensive data and typically require the elaboration of detailed assessment and sampling guidelines (*e.g.*, to confirm the energy efficiency level of a model of electric motor). Some regulations introducing testing requirements allow for the use of alternative testing methods upon approval by the administrative authority. Testing requires the availability of accredited laboratories or other relevant testing entities.

Inspection consists in the examination of a product or of the process used for its production, without laboratory testing, to determine whether the relevant technical regulations have been fulfilled. The highly technical nature of climate change related technical regulations makes inspection a seldom used conformity assessment technique.

Certification "involves written assurance (the certificate) issued by an independent external body, stating that a product, building or company conforms to specific energy-efficiency or emission standards" (WTO/UNEP, 2009). It is generally based on previous testing and inspection.

Conformity may be self-declared or based on third-party assessments. An example for self-declaration is the European CE mark. By applying the CE mark on a product, the manufacturer confirms that the product meets European Union safety, health or environmental regulations and addresses the conformity assessment requirements of the relevant European Union Directives. An example for third-party conformity assessments are the processes conducted by the International Electrotechnical Commission (IEC), which manages the operation of four conformity assessment systems including the IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications (IECRE).

3 Applicable legal framework

3. Applicable legal framework

The international legal framework relevant for climate change related NTMs includes both international climate change instruments and international trade law instruments. Policy makers and regulators must take these two bodies of law into account, and understand their linkages when designing technical regulations, conformity assessments and mandatory labelling schemes.

3.1. Climate change law

Climate change instruments —and, in particular, the UNFCCC and the Paris Agreement— do not indicate what measures States should adopt in the context of their climate change mitigation and adaptation strategies. The Paris Agreement (in Article 6 paragraphs 8 and 9) recognizes that Parties will use non-market approaches (NMAs) in the implementation of their NDCs and defines a framework for NMAs. A UNFCCC technical paper from 2014 provides examples of NMAs, which include fiscal instruments (such as taxes or financial subsidies), education and awareness raising as well as technical regulations (UNFCCC, 2014). In the end, however, it is up to each State to decide what specific measures to adopt to achieve their objectives and targets. It follows that, whenever a State adopts a technical regulation, a labelling requirement or a conformity assessment procedure, the choice of such a measure is not mandated by any climate change instrument. The Paris Agreement specifies the overall objectives to be pursued but it is up to each State individually to set its own emissions reduction targets and to select the measures to be adopted at the national level to achieve them. This is an important clarification to keep in mind in case any 'conflict' arises with the rules established by trade agreements.

Therefore, potential legal 'conflicts' on climate change related NTMs do not occur between international trade and international climate change norms, but rather between international trade norms and *domestic* policies or measures. Trade agreements regulate a wide variety of trade measures, regardless of any legitimate objective they may pursue (*i.e.*, climate change mitigation). Climate change instruments do not require the adoption of specific measures. The few references that climate change instruments make to domestic climate change mitigation or adaptation measures go in the same direction as trade norms in that they clarify the need to ensure that whatever climate measure a State decides to adopt, it shall not "constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade."[12] As discussed in the fourth Section of this report, climate change law also sets out a series of guiding principles to ensure equity in climate change-related NTMs and mitigate potential adverse trade and development impacts on developing countries.

In addition to climate change law, broader international environmental law emphasizes the mutual supportiveness between the two corresponding regimes, the preference for multilateral (rather than unilateral) trade-related environmental measures and the importance of basing environmental measures on international consensus. These key principles of international environmental law can be found in the text of the 1992 Rio Declaration on Environment and Development, in particular Principle 12. Finally, it reiterates the clarification that "trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade."

This means that, to be effective in pursuing climate change mitigation objectives, technical regulations will have to be designed and implemented in a way that is non-discriminatory and not excessively trade restrictive.

3.2. International trade law

Avoiding arbitrary or unjustifiable discrimination and disguised restrictions on international trade represents one of the main objectives of multilateral trade law. In this regard, WTO agreements and jurisprudence provide a detailed framework for the adoption and implementation of climate change-related TBTs.

3.2.1. Applicable rules – GATT and the Technical Barriers to Trade Agreement

The key WTO agreements governing climate change-related NTMs are the GATT and the TBT Agreements. As far as the GATT is concerned, Articles I (Most-favoured nation or MFN) and III (National Treatment) are especially relevant. Together, they require WTO Members not to discriminate against foreign products in favour of 'like' products from a third State or 'like' domestic products. In particular, according to Article III:4:

> *The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution, or use […].*

Article XI of the GATT prohibits quantitative restrictions with certain exceptions. Paragraph 2(b) introduces an exception to the general rule contained in Article XI, paragraph 1, and allows import and export prohibitions or restrictions "necessary to the application of standards or regulations for the classification, grading or marketing of commodities in international trade".

Finally, Article XX of the GATT contains a list of general exceptions for public policy objectives. This allows WTO Members to derogate from a GATT rule provided that this is not done 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.

Three justifications listed under GATT Article XX are particularly relevant for climate change-related NTMs: Protection of human, animal or plant life or health, compliance with laws or regulations which are not inconsistent with the provisions of the GATT, and conservation of exhaustible natural resources. Article XX has been relied upon in several disputes to justify measures adopted for environmental or public health reasons. In the *Brazil – Tyres* case, Article XX was applied for the first time by the WTO's Appellate Body in relation to climate change (see subsection 3.2.3).

For technical regulations, the TBT Agreement generally takes precedence over the GATT. The TBT Agreement addresses a subset of the measures covered by GATT Article III (National Treatment), namely those identified in Article III:4 (see subsection 3.2.1). It follows that the same measure (*i.e.*, a technical regulation) could potentially fall under the purview of both the GATT and the TBT Agreement. The two agreements, however, differ in their application, as they do not include the same test for legal consistency and for non-discrimination. Between the two agreements, the TBT Agreement takes precedence, based on the General Interpretative Note to Annex 1A (which addresses the relationship between the two agreements), and WTO jurisprudence on the matter (WTO, 2001 and WTO, 2002). It follows that the GATT will only apply residually whenever a technical regulation does not fall under the scope of the TBT Agreement.

3.2.2. Purpose and scope of the Technical Barriers to Trade Agreement

The TBT Agreement aims to ensure that technical regulations, standards and conformity assessment procedures are non-discriminatory and do not create unnecessary obstacles to trade. However, the agreement also recognizes Members' rights to adopt the regulations and standards they consider appropriate, for example for the protection of the environment and climate change mitigation.

The TBT Agreement covers three sets of activities:

1. **the preparation, adoption, and application of technical regulations by governments.** Technical regulations, as defined in Annex 1 of the TBT Agreement are documents laying down product characteristics or the related process and production methods with which compliance is mandatory. According to the Appellate Body in *EC – Asbestos*, such 'characteristics' "might relate, *inter alia*, to a product's composition, size, shape, colour, texture, hardness, tensile strength, flammability, conductivity, density, or viscosity" (WTO, 2001). TBT Annex I also specifies that technical regulations may also include or deal with terminology, symbols, packaging or labelling requirements. As explained by the Appellate Body in *EC – Asbestos*, "These examples indicate that "product characteristics" include, not only features and qualities intrinsic to the product itself, but also related "characteristics," such as "the means of identification, the presentation, and the appearance of a product (WTO, 2001)." Product characteristics can thus be expressed either in positive (what traded goods must contain) or negative terms (what traded goods must not contain). (WTO, 2001)
2. **the preparation, adoption and application of standards by standardizing bodies.** These are defined in Annex 1 of the TBT Agreement as "documents approved by a recognized body, that provide for common and repeated rules, guidelines or characteristics for products or related processes and production methods with which compliance is not mandatory."
3. **the conformity assessment procedures** used to determine whether the relevant requirements in technical regulations or standards are fulfilled.

All the measures mentioned in Section 2 of this report fall under one of these three broad categories, and particularly category 1) and 3).[13]

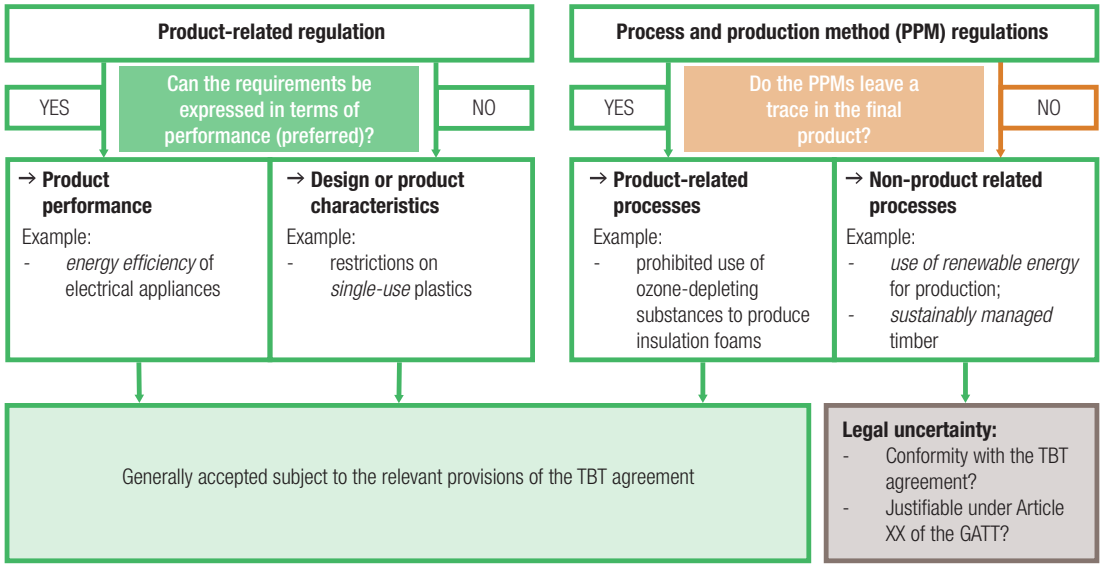
3.2.3. Process and production method under the Technical Barriers to Trade Agreement: A key question for the design of climate change-related technical regulations

PPMs address the way in which a product is produced, *i.e.*, by introducing energy-efficient requirements, GHG emission limits or mandatory renewable energy input levels, and they can contribute significantly to emissions reduction. These PPMs are particularly relevant for the definition of climate change-related technical regulations. The TBT Agreement takes into account the importance of PPMs – unlike other agreements like the GATT that do not mention them – by explicitly referring to PPMs in Annex 1. Technical regulations, for instance, are described as a "document which lays down product characteristics or their related processes and production method." This definition, however, only refers to the process and production method that is "related" to a product, and this may raise some questions from a climate change perspective.

PPMs can be of two types: product-related (when the PPM leaves a trace, an effect or is detectable in the final product) and non-product-related (when the PPM does not leave any trace and is not detectable in the final product). The use of the word "related" in the definition of technical regulations seems to suggest that only technical regulations based on product-related PPMs fall under the scope of the TBT Agreement. The conclusion may be different for labelling requirements, as the definition, when it refers to labelling requirements, omits the word "related": "labelling requirements as they apply to a product, process or production method." The Appellate Body in *US – Tuna II*, while not discussing the role of PPMs, found that the measure in question (a United States labelling scheme based on the method of fishing tuna) fell under the scope of the TBT Agreement (WTO, 2012c).

Clarifying whether non-product-related PPMs fall under the scope of the TBT Agreement is extremely relevant for climate change mitigation, considering that, from a climate change perspective, the way in which a product is produced (*i.e.,* its carbon footprint) despite being an essential component of the product itself, often leaves no detectable traces in the final product. It should be noted that, if a measure based on non-product-related PPMs is found not to fall under the scope of the TBT Agreement, it will then be examined under Article III of the GATT and might be justifiable under GATT Article XX. Removing a technical regulation from the scope of application of the TBT Agreement, however, automatically removes the application of the TBT transparency provisions (*i.e.*, the obligation to notify the technical regulation). The result can be detrimental for those countries, especially developing countries, whose exports face those technical regulations (Marceau, 2016). Figure 1 summarizes the different types of technical regulations and their implications under international trade law.

Figure 1.
Types of technical regulations and their WTO compliance



3.2.4. Ensuring the WTO compliance of technical regulations

Technical regulations can have a significant impact on trade and competitiveness and may hide protectionist intents. At the same time, they may meet legitimate regulatory objectives including overcoming negative externalities, such as is the case for many climate change-related technical regulations. All these factors are taken into account by Article 2 of the TBT Agreement, which governs the preparation, adoption and application of technical regulations.

Even technical regulations that fulfil a legitimate objective must meet certain conditions of implementation. They shall (i) not be discriminatory (Article 2.1); (ii) not be more trade-restrictive than necessary to fulfil their objective, so as not to create unnecessary obstacles to international trade (Article 2.2); and (iii) be based on international standards, except when such international standards or some of their relevant provisions would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued (Article 2.4). The following subsections will address each of these elements.

3.2.5. Legitimate objectives

Article 2.2 of the TBT Agreement lists a number of possible legitimate objectives: "Such legitimate objectives are, *inter alia*: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment." The case law shows a deferential attitude toward the WTO Member adopting the technical regulation

when it comes to reviewing the legitimacy of the objective being pursued. As noted by the Appellate Body in *US – Tuna II (Mexico)*, the use of the words 'inter alia' in Article 2.2 suggests that the provision does not set out a closed list of legitimate objectives, but rather lists several examples of legitimate objectives.

On the basis of the formulation of TBT Article 2.2 and the relevant case law, there is hardly any doubt that a technical regulation adopted for climate change mitigation purposes would be considered as pursuing a legitimate objective. This is also true on the basis of other WTO Agreements. The GATT, for instance, in Article XX, allows measures that are "necessary to protect human, animal or plant life or health" (letter b), or "relating to the conservation of exhaustible natural resources" (letter g).[14] Applying GATT Article XX(b), the Appellate Body in *Brazil – Tyres* explicitly referred to measures adopted to tackle climate change and global warming (WTO, 2007[15]). In its report, the Appellate Body concluded that even if the contribution of a measure to public health or environmental objectives is not immediately observable, it can still be justified under Article XX(b) on the basis of a demonstration that it is "apt to produce a material contribution to the achievement of its objective," considering in particular that "certain complex public health or environmental problems [such as climate change] may be tackled only with a comprehensive policy comprising a multiplicity of inter acting measures [and] the results obtained from certain actions ... can only be evaluated with the benefit of time" (WTO, 2007). Similarly, the plurilateral Government Procurement Agreement (GPA), revised in 2012, allows procuring entities to prepare, adopt, and apply technical specifications "to promote the conservation of natural resources or protect the environment" (Article X.6). Finally, the preamble of the Agreement establishing the WTO mentions sustainable development among the WTO's objectives and has been relied upon by the Appellate Body in interpreting other WTO Agreements' norms (WTO, 1998b).

3.2.6. Non-discrimination

The non-discrimination requirement can be found in Article 2.1 of the TBT Agreement:

> **Members shall ensure that in respect of technical regulations, products imported from the territory of any Member shall be accorded treatment no less favourable than that accorded to like products of national origin and to like products originating in any other country.**

The Appellate Body in *US – Clove Cigarettes* and *US – Tuna II (Mexico)* set out a three-pronged legal test for this provision. Article 2.1 of the TBT Agreement consists of three elements that must be demonstrated in order to establish an inconsistency with this provision, namely:

- that the measure at issue **constitutes a 'technical regulation'** within the meaning of Annex 1.1;
- that the imported products **must be like the domestic product** and the products of other origins; and
- that the treatment accorded to imported products **must be less favourable** than that accorded to like domestic products and like products from other countries (WTO, 2018a and 2012b).

A technical requirement (first requirement, see subsection 3.2.2) can only be discriminatory if products are 'like' (second requirement). In fact, if a technical regulation favours a domestic product over a different imported product, there is no discrimination. For there to be discrimination, the two products need to be *"like". A*ccording to the Appellate Body, *"like" products are a subset of directly competitive or substitutable products: all like products are, by definition, directly competitive or substitutable products, whereas not all "directly competitive or substitutable" products are "like"* (WTO, 1999).

A key question in the context of climate change-related technical regulations is whether goods produced with a different emission intensity, energy intensity or type of energy source may be considered 'unlike' pursuant to Article 2.1. of the TBT Agreement. If this were the case, a country may be allowed to favour a domestic product produced with renewable energy or with a less CO_2-emitting

process over an imported product produced with conventional energy or with a higher-emitting process. The two products, in all other respects, may be identical but the regulatory objective would allow to differentiate between them.

The case law shows a preference for a competition-oriented approach to the 'like products' analysis under Article 2.1 of the TBT Agreement rather than one based on the regulatory objectives of a technical regulation (WTO, 2012a). This would mean that what matters is whether two products compete in the same market. If it is shown, for instance, that a product produced with renewable energy and one produced with conventional energy compete in the same market, they will probably be found to be "like" (regardless of the clear contribution that the first product makes towards climate change mitigation) and any different treatment may therefore be considered a violation of TBT Article 2.1. Interestingly, however, the Appellate Body in *US – Clove Cigarettes* acknowledged the relevance of regulatory concerns (in that case these concerns related to the protection of public health), *"to the extent they have an impact on the competitive relationship between and among the products concerned.* (WTO, 2012a)*"*. This would mean that proving that demand is affected by the regulatory objective underlying a differential treatment (*i.e.*, climate change mitigation) is a factor that should be taken into account in future decisions when determining the likeness of two products.

The third requirement is that of treatment no less favourable than that accorded to like domestic products and like products from other countries. Considering that the object and purpose of the TBT Agreement is to strike a balance between trade liberalization and Members' right to regulate, the Appellate Body has clarified that Article 2.1 should be interpreted as permitting "detrimental impact on competitive opportunities for imports that stems exclusively from legitimate regulatory distinctions" (WTO, 2012a). The burden of proof falls on the complainant to demonstrate less favourable treatment, which the respondent may rebut by showing that the detrimental impact on competitive opportunities for imports stems exclusively from legitimate regulatory distinctions (*i.e.,* a regulatory distinction aimed at climate change mitigation as in the example above). (WTO, 2018a)

3.2.7. The measures shall not be more trade restrictive than necessary to fulfil their objective

Article 2.2 of the TBT Agreement reads (in the relevant part):

Members shall ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create.

The Appellate Body in *US – Tuna II (Mexico)* summarized the steps involved in the analysis under Article 2.2 of the TBT Agreement (WTO, 2018a).

- The first factor to be considered is the **degree of contribution to the legitimate objective**, which requires considering the design, structure and intended operation of the measure, as well as its actual impact (WTO, 2018b).
- The second factor is the **trade-restrictiveness of the measure**, which will depend on the circumstances of each case (WTO, 2018b) and will require a comparison with alternative measures. It is not necessary for the alternative measure to achieve a degree of contribution identical to that of the challenged measure but merely equivalent. The burden of proof falls on the complainant to demonstrate that the measure at stake is more trade restrictive than necessary to achieve the contribution it makes to the legitimate objective and to present a possible alternative. It is then for the respondent to rebut the

complainant's prima facie case by demonstrating, for example, that "the alternative measure identified by the complainant is not, in fact, 'reasonably available' [*i.e.*, because it entails undue burdens or prohibitive costs], is not less trade restrictive, or does not make an equivalent contribution to the achievement of the relevant legitimate objective (WTO, 2012b)." As a result, were a country to decide to adopt a climate change related technical regulation, it would be advisable to ensure that other less trade-restrictive alternatives that would allow to achieve an equivalent result (in terms of climate change mitigation) are considered but excluded because they are too costly, burdensome, not technically feasible or simply not available.

- The third factor is the consideration of the **risk that non-fulfilment would create**, which may lead to the exclusion of an alternative that involves a greater risk of non-fulfilment of the objective pursued by the technical regulation at stake (WTO, 2011).

3.2.8. The importance of international standards

The importance of basing technical regulations on international standards is evident from Articles 2.4 and 2.5 of the TBT Agreement. According to Article 2.4:

> **Where technical regulations are required and relevant international standards exist or their completion is imminent, Members shall use them, or the relevant parts of them, as a basis for their technical regulations except when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems.**

Article 2.4 requires WTO Members to base their technical regulations on the relevant international standards, if they exist, and unless they would be ineffective or inappropriate to fulfil the legitimate objective pursued. It follows that States are not obliged to implement international standards: they must observe them only if they decide to adopt a technical regulation in an area covered by an international standard. In addition, the regulating State can decide to deviate from a relevant international standard if it proves to be 'ineffective' or 'inappropriate'. In case of conflict regarding the deviation from an international standard, the burden of proof stays with the complainant to demonstrate that the international standard is appropriate and effective (WTO, 1998a).

Technical regulations that conform with international standards are presumed to be necessary, according to Article 2.5 of the TBT Agreement. This means that they are presumed to represent the least trade-restrictive option available to achieve a stated objective.

It follows that climate change related technical regulations and conformity assessment procedures that are based on an international standard and are non-discriminatory will be judged to be TBT-consistent. The TBT Agreement indicates that international standards are those prepared by the "international standardization community" (see box 1 for an overview of international standards). ISO standards in areas such as motor vehicles, transportation fuel, biofuels, building or domestic appliances (box 1) have often been used as a basis for technical regulations at the national level. To provide an example, the European Union Energy Performance Buildings Directive (2018) refers to ISO 52000-1, 52000-3, 52010-1, 52016-1, and 52018-1.

Part 4 of this report will review the potential of international standards to be more environmentally effective, more cost-efficient and more equitable towards developing countries. This is especially true for countries with limited capacity to develop national climate change related standards or to meet requirements from multiple diverging standards affecting the same product. As Section 4 will emphasize, however, several factors need to be taken into account to ensure the effectiveness, efficiency and equitability of international standards.

4 Effectiveness and equity of climate change-related technical regulations

4. Effectiveness and equity of climate change related technical regulations

The legal frameworks applicable to climate change related technical regulations do not contain any concrete indication as to the effectiveness, feasibility, and equity of these measures. This Section of the report will address these questions by briefly assessing (i) the effectiveness and efficiency of climate change-related technical regulations; (ii) the political feasibility of climate change-related technical regulations *vis-à-vis* other measures (*i.e.*, border tariffs); and (iii) the equity and fairness of climate change-related technical regulations, in particular concerning developing countries.

4.1. Effectiveness and efficiency

Technical regulations need to be effective: the actual impact of the requirement must be measured against its stated purpose (*e.g.*, the reduction of the carbon footprint of a product and/or of its production process). The climate change effectiveness of a measure is not easy to determine, considering that other factors could also contribute to the achievement of a given goal or target. Nevertheless, a number of studies have emphasized the potential of climate change-related technical regulations for increasing the energy efficiency of products or reducing their carbon footprint (Geller, 2006). For instance, energy efficiency standards and regulations on appliances in the European Union and Japan have been linked to a 1 per cent average annual efficiency increase (Fekete *et al.,* 2021). Similarly, studies have confirmed the potential of labelling requirements to generate behavioural changes on consumers and manufacturers (WTO/UNEP, 2009).

Climate change-related technical regulations need to be efficient: Measures must also be assessed against the level of adverse trade impacts. In this regard, the application of WTO rules should ensure that no *unnecessary* trade distortions are created (see Section 3). Climate change law also provides a set of guiding principles to limit the adverse trade and development impacts of response measures on developing countries. These principles will be further detailed in subsection 4.3. However, trade distortions may still occur.

The effectiveness and efficiency of regulations must also be compared to price mechanisms, *i.e.*, carbon pricing. Generally, price mechanisms are considered more efficient since it is left to the market to find the cheapest way to achieve a specified emission reduction goal. For example, a maximum for energy consumption of electrical appliances in stand-by modus as in the European Union may be more costly per reduced emissions than more stringent car efficiency requirements or a change in mobility behaviour. Furthermore, governments may raise income from carbon pricing. However, the reality has shown that pricing reflecting all external effects is difficult (see subsection 4.2) and that the introduction of regulations can trigger innovations to enhance energy efficiency.

The challenge of carbon leakage – the relocation of production operations to countries with laxer emissions constraints for cost reasons related to climate policies – exists with regulations as well as with carbon pricing. Evidence comparing the two alternatives, regulations, and price-based mechanisms, is scarce and beyond the scope of this study.

The environmental effectiveness and efficiency of technical regulations and their "trade efficiency" will also depend on the convergence of standards. Currently, technical regulations in different countries often rely on different standards, signalling a lack of harmonization and acting as a barrier to trade by raising information and compliance costs (Vanzetti, Peters and Knebel, 2016). Conversely, aligning these divergent standards (*e.g.*, divergent carbon emissions calculation methodologies) can contribute to increasing the environmental effectiveness of climate change-related TBT measures (*e.g.,* by

enabling harmonization and ensuring that more effective methods are employed) (WTO, 2022), and help reduce costs for businesses.

The text of the TBT Agreement underscores the importance of harmonization and provides several pathways to promote it:

1. Encouraging mutual recognition of technical regulations and conformity assessment (Article 2.7); Urging WTO Members to base their technical regulations and conformity assessment procedures on international standards (Preamble, Article 2.4); Presuming the necessity of technical regulations that are based on international standards (Article 2.5); and Special rules apply to developing countries. (See later para. 85)
2. **The way in which international standards are set will directly impact their acceptance by countries, thus influencing the effectiveness and equity of the measures adopted on their basis** (see subsection 4.3). The TBT Committee has developed some guidelines on how to develop international standards: the *Six Principles for the Development of International Standards, Guides and Recommendations*, which are intended to help international standards better facilitate global trade and to provide guidance in the areas of:
    - **Transparency.** All essential information regarding work programs, proposals for standards, guides and recommendations under consideration, as well as the final results should be made easily accessible to at least all interested parties in the territories of at least all WTO Members. Procedures should be established so that adequate time and opportunities are provided for written comments.
    - **Openness.** Membership of an international standardizing body should be open on a non-discriminatory basis to the relevant bodies of at least all WTO Members. In addition, any interested member of the international standardizing body, *including especially developing country Members*, with an interest in a specific standardization activity should be provided with meaningful opportunities to participate at all stages of standard development. (See also later para. 84)
    - **Impartiality and consensus.** All relevant bodies of WTO Members should be provided with meaningful opportunities to contribute to the elaboration of an international standard so that the standard development process will not give privilege to, or favour the interests of, a particular supplier/s, country/ies or region/s. Consensus procedures should be established to take into account the views of all parties concerned and to reconcile any conflicting arguments.
    - **Effectiveness and relevance.** International standards need to be relevant and to effectively respond to regulatory and market needs, as well as scientific and technological developments in various countries. They should not distort the global market, have adverse effects on fair competition or stifle innovation and technological development. Whenever possible, international standards should be performance based rather than based on design or descriptive characteristics.
    - **Coherence.** The principle of coherence exhorts international standardizing bodies to avoid duplication of, or overlap with, the work of other international standardizing bodies. In this respect, cooperation and coordination with other relevant international bodies is essential.
    - **Development dimension.** The development dimension requires taking into consideration the constraints on developing countries to effectively participate in standards development. Tangible ways of facilitating developing countries' participation in international standards development should be sought. Provisions for capacity building and technical assistance within international standardizing bodies are important in this context.[16]

The Six Principles have been adopted by standardizing bodies such as the International Code Council (ICC), which develops international codes for the building sector to ensure GHG emissions reduction and enhanced resilience (International Code Council 2021). However, it is hard to precisely ascertain the adherence of standardizing bodies to the Six Principles for the Development of International Standards, Guides and Recommendations, as well as the way in which they are implemented in the context of climate change-related standards. This is because the TBT Committee does not have a process in place at the moment to monitor such adherence (WTO/OECD, 2019).

4.2. Political and institutional feasibility

Regulatory instruments are generally seen as facing less political constraints when compared with other measures such as carbon taxes. This consideration of political feasibility, in addition to effectiveness and efficiency, represents another important criterion for evaluating climate change mitigation measures. By contrast, carbon taxes often face strong political opposition and are overall not politically popular (Gupta *et al.*, 2007). As policymakers tend to support policies that minimize the economic impact on businesses and households, and that secure durable political support, they often prefer narrowly-targeted regulations over taxes (Jenkins and Karplus, 2017).[17]

Developing countries, in particular, may often lack the institutional infrastructure required to collect and monitor climate-related taxes. Moreover, market-based instruments such as carbon taxes often require fully developed market economies in order to be effective (Gupta *et al.*, 2002),[18] and remain surrounded by significant uncertainty as to their WTO-consistency.

4.3. Equity and fairness: The perspective of developing countries

Due to potentially increased costs and capacity challenges, climate change-related technical regulations could hinder developing countries competitiveness and their ability to access developed country markets (IISD, 2021[19]) In particular, concerns have been raised about the growing complexity and diversity of environmental labelling schemes, which are sometimes based on life-cycle analysis and on specific designs or characteristics. This creates difficulties for developing countries which often lack carbon efficient technologies, making it more difficult for their companies to be certified for labels in developed countries (Appleton, 2009). Moreover, conformity assessment procedures can be lengthy and costly for many developing countries which, without being able to provide certification and inspection services, will be excluded from export markets (Brenton and Chemutai, 2021).

The special needs of developing countries are taken into account by both international trade and climate law. The following paragraphs will address these considerations in greater depth.

The UNFCCC recognizes that measures taken by developed countries to mitigate climate change could negatively impact developing economies and impede sustainable development efforts and provides general guidance to mitigate these impacts. These provisions mostly provide obligations for developed countries when they decide to adopt climate change mitigation measures.

On the basis of a number of decisions,[20] the following guiding principles can be emphasized:

1. *Economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties* and responses to climate change should be coordinated with social and economic development (UNFCCC Article 4.7; Decision 5/CP.7). For this reason, *developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties* (UNFCCC Article 4.5).

2. One of the core principles of the UNFCCC recommends that the *specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention* be given full consideration (UNFCCC Article 3.2). Resulting from this principle, *developed countries shall take into account the specific needs of less developed countries when designing and implementing response measures* (UNFCCC Articles 4.9 and 4.10; Decision 5/CP.7; Paris Agreement Article 4.15). *Developed countries shall consider and minimize the adverse impacts of their response measures on developing countries* (UNFCCC Article 4.8 and Kyoto Protocol Articles 2.3 and 3.14. Para. 89 of the Cancun Agreements urges developed countries to *avoid* such negative impacts, both social and economic). *Developed countries shall make sure that response measures do not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade* and, more generally, minimize their adverse effects on international trade (UNFCCC Article 3.5; Kyoto Protocol, Article 2.3; Bali Action Plan, at 10, Decision 19/CP.26)[21]

   - These issues are still currently being discussed in different fora, such as the Forum on the impacts of the implementation of response measures under the Convention, Kyoto Protocol and the Paris Agreement, the Katowice Committee of Experts on Impacts of Implementation of Response Measures, and the Forum on Response Measures.
   - The main challenges expressed by developing countries have been a lack of experience with the assessment of the impacts of trade-related response measures, a lack of case studies and a lack of methodological and analytical tools.
   - To address these challenges, the Forum on the impacts of the implementation of response measures has been providing a platform to share information and best practices in order to facilitate and improve the assessment of the impacts of response measures in developing countries and enhance their capacity by providing concrete examples and case studies. To this end, the Forum has emphasized the importance of training and capacity building efforts to enhance developing countries' ability to carry out their own assessments and analyses of the implementation of response measures, as well as the essential role of technology development and transfer to maximize the positive and minimize the negative impacts of response measures (UNFCCC, 2021b).

3. *If negative impacts are produced, developed countries should assist developing ones in addressing them by providing support, including financial resources, transfer of technology and capacity-building*. (Decision 5/CP.7, paras 23 and 27; Cancun Agreements, para. 89). *Developing countries should provide information on their specific needs and concerns arising from the impact of the implementation of response measures* (Decision 5/CP.7, para. 20).

On the international trade law side, *Special and Differential Treatment (SDT)* in favour of developing countries is embedded across the various agreements of the WTO. These provisions are meant to create additional equity and fairness accounting for the challenges faced by developing countries. Across all WTO agreements, there are 155 SDT provisions covering the following categories: Provisions aimed at increasing the trade opportunities of developing country Members; Provisions that require WTO Members to safeguard the interests of developing country Members; Flexibility of commitments, of action, and use of policy instruments; Transitional time-periods; Technical assistance; and Provisions relating to least developed country Members.

The most pertinent SDT provisions in the context of climate-change related measures are found in the TBT agreement. The preamble sets the tone by declaring that "developing countries may encounter special difficulties" and that WTO Members desire "to assist them in their endeavours in this regard" (Preamble 9th recital).

Article 12 requires WTO Members, in the preparation and application of technical regulations, standards and conformity assessment procedures, to take account of the special development, financial and trade needs of developing country Members, with a view to ensuring that such technical regulations, standards and conformity assessment procedures do not create unnecessary obstacles for exports from developing country Members (Article 12.3).

Article 11 outlines the technical assistance that Members should provide to developing countries. The provisions cover support on the preparation of technical regulations (Article 11.1), on the establishment of national standardizing bodies, on the participation in international standardizing bodies (Article 11.2), on compliance and conformity assessment with regard to Members' import requirements and standards (Articles 11.3, 11.4, 11.5, 11.6). All of the above technical assistance shall be prioritized for least developed countries (Article 11.8). Developing countries that take advantage of these commitments and build the necessary capacities are more likely to be able to comply with the increasing number and complexity of climate change related TBT applied by developed countries.

Furthermore, when introducing or changing conformity assessment procedures, WTO Members are held to give enough time, particularly for developing countries, between publication and entry into force (Article 5.9). This reduces the potential negative impact on developing countries when developed countries introduce climate change related measures.

The actual implementation and support given to developing countries to avert negative trade and development impacts of climate change-related TBTs will determine the level of fairness and equitability of such measures. Enhancing developing countries' capacity to adopt and comply with climate change-related technical regulations will play a key role in the global uptake of carbon efficient products and technologies.

In this context, the regular work of the WTO TBT Committee is critical, including on Specific Trade Concerns (STCs), triennial reviews and exchanges of best practices. If developing countries are negatively affected by complex climate change related requirements or conformity assessment procedures, they can raise STCs at the WTO Committee. The imposing Member may adjust the requirement or provide technical assistance to mitigate the impact of the measure. Consultation on STCs in the TBT Committee are a powerful tool to establish further equity between developing and developed countries. The triennial reviews allow WTO Members to discuss.

Furthermore, Trade and Environmental Sustainability Structured Discussions (TESSD) are ongoing at the WTO. The TESSD offer a platform to specifically discuss climate change related NTMs and exchange experiences and best practices, for example on carbon accounting standards by ISO. However, so far, only 74 WTO Members are participating and developing countries are underrepresented.

Another important consideration is the disproportionate impact on women and small and medium size enterprises (SMEs). This has been studied and should be taken into account when designing and implementing technical regulations. Studies show that NTMs often disproportionately negatively affect women (as consumers, producers, and traders (UNCTAD, 2022) as well as SMEs).

5 Recomendations

5. Recommendations

On the basis of the analysis conducted in this report, the following recommendations can be made for the way forward to ensure the effectiveness, efficiency and equity of climate change-related technical regulations and conformity assessment procedures.

Recommendation 1.

A task force should be created to support information collection and transparency on climate change-related TBTs. UNCTAD has longstanding cooperation with leading agencies and member States for the collection and dissemination of NTMs data. Its NTMs platform could be used to support the proposed effort.

Recommendation 2.

Dialogue among developed and developing countries' policymakers on climate change-related TBTs should be fostered. Such dialogue should aim, among other goals, at facilitating the identification of shared priorities for the adoption, at the international or regional level, of relevant climate change-related standards or technical regulations. The WTO TBT Committee plays a central role.

Recommendation 3.

Technical support and capacity building should be provided to developing countries for the joint formulation, adoption and implementation of climate change-related technical regulations and standards. As highlighted in the present Report, the adoption of common standards and technical regulations has the potential to lower adoption- and compliance related costs for developing countries' regulators and businesses. Developing countries should take full advantage of the commitments made by WTO Members in the TBT Agreement, including through raising specific trade concerns (STCs).

Recommendation 4.

Particular emphasis should be placed on ensuring that climate change-related technical regulations and conformity assessment procedures, as well as the international standards they are based on, **reflect the context, needs and challenges of all countries, including and in particular those of developing countries**. Such emphasis will positively impact the effectiveness, cost-efficiency, and level of political support of and for future measures.

Recommendation 5.

Technical regulations should be, whenever possible, based on performance rather than design or descriptive characteristics. Performance-based technical regulations are preferred by the TBT Agreement, and can be more effective from a climate perspective, as they stimulate innovation, changes in production processes and the use of alternative technologies; they are also more politically feasible, as they entail lower costs for producers; and are fairer towards developing countries.

6 Conclusions

6. Conclusions

Climate change-related regulations are increasingly used to contribute to the global target of limiting the increase of the global average temperature. They are an important instrument to limit GHG emissions and may be more politically acceptable than alternative approaches.

It is increasingly recognized that international trade law has a significant role to play in the context of countries' climate change mitigation strategies. As this report has shown, and as the IPCC has emphasized, international trade rules have the potential of stimulating and facilitating the adoption of climate change mitigation technologies and policies. At the same time, international rules can sometimes be seen as obstacles to countries' attempts to introduce climate-related trade measures.

This report has emphasized the potential for mutual supportiveness between international climate and trade law. Linkages between the two regimes require governments and policymakers in each area to take account of the other. Both trade and climate change legal instruments recognize the importance of avoiding the adoption of trade measures that constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. As trade rules may both constrain and facilitate domestic action to address climate change, the selection of what type of technical measure to adopt is crucial in this regard.

To this end, the present report has proposed a taxonomy of climate change-related technical regulations and highlighted certain considerations and criteria that can guide the development and adoption of international standards and domestic measures that are environmentally effective, WTO-compliant, and fair towards developing countries, thereby ensuring mutual supportiveness between international climate and trade law.

References

Appleton A (2009). Private Climate Change Standards and Labelling Schemes under the WTO Agreement on Technical Barriers to Trade. In: Cottier T *et al.,* eds. *International Trade Regulation and the Mitigation of Climate Change*. Cambridge University Press.

Bellmann C and van der Ven C (2020). Greening regional trade agreements on non-tariff measures through technical barriers to trade and regulatory co-operation. *OECD Trade and Environment Working Papers*. OECD Publishing, Paris. No. 2020/04.

Brenton P and Chemutai V (2021). *The Trade and Climate Change Nexus. The Urgency and Opportunities for Developing Countries*. World Bank Group.

Dröge S *et al*. (2018). *Mobilising Trade Policy for Climate Action under the Paris Agreement. Options for the European Union*. SWP Research Paper. February.

Elkahwagy R, Gyanchandani V and Piselli D (2016). *UNFCCC Nationally Determined Contributions: Climate Change and Trade.* Centre for Trade and Economic Integration, Graduate Institute of International and Development Studies.

Epps T and Green A (2011). *Reconciling Trade and Climate: How the WTO Can Help Address Climate Change*. Edward Elgar.

Fekete H *et al*. (2021). A review of successful climate change mitigation policies in major emitting economies and the potential of global replication*. Renewable and Sustainable Energy Reviews.* 137.

Gawel E *et al*. (2014). A Public Choice View on the Climate and Mix in the EU – How Do the Emissions Trading Scheme and Support for Renewable Energies Interact?. *Energy Policy*. 64.

Geller H *et al*. (2006). Policies for Increasing Energy Efficiency: Thirty Years of Experience in OECD Countries. *Energy Policy*.

Gupta S *et al*. (2007). *Policies, Instruments and Co-operative Arrangements, in Climate Change 2007: Mitigation.* Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.

Holzer K and Lim A (2020). Trade and Carbon Standards: Why Greater Regulatory Cooperation is Needed. In: Esty D and Biniaz S, eds. *Cool Heads in a Warming World: How Trade Policy Can Help Fight Climate Change*. Yale Center for Environmental Law and Policy.

IISD (2021). *Impacts of Climate Change Policies on Developing Country Export Markets*. July.

International Code Council (2021). *Pathways to Climate Resilience: The Central Role of Building Codes in Climate Adaptation and Mitigation*.

IPCC (2007). *Climate Change 2007: Synthesis Report*. Geneva.

IPCC (2014). *Climate Change 2014: Synthesis Report*. Geneva.

IPCC (2022). *Climate Change 2022: Mitigation of Climate Change: Synthesis Report*. Geneva.

Jenkins J and Karplus V (2017). Carbon Pricing under Political Constraints: Insights for Accelerating Clean Energy Transitions. In: Arent D, ed. *The Political Economic of Clean Energy Transitions*. Oxford University Press.

Knebel C and Peters R (2019). Non-tariff measures and the impact of regulatory convergence in ASEAN. In: Ing L Y, Peters R and Cadot O, eds. *Regional Integration and Non-Tariff Measures in ASEAN*. Economic Research Institute for ASEAN and East Asia. Jakarta.

Kristy M and Monkelbaam J (2015). Climate Change, Labelling, International Standards and the Technical Barriers to Trade Agreement: Are They in (Dis)harmony?. *Journal of World Trade Studies*. 5(2)

Marceau G (2016). The Interface Between the Trade Rules and Climate Change Actions. In: Park DY, ed. *Legal Issues on Climate Change and International Trade Law*. Springer. 3–39.

Mbengue M (2011). Private Standards and WTO Law. *Bridges Trade BioRes*. 5(1).

Mavoridis P (2016). The WTO Agreements on Trade in Goods. *The Regulation of International Trade.* MIT Press, 2.

Russell C and Vaughan W (2004). The Choice of Pollution Control Policy Instruments in Developing Countries: Arguments, Evidence and Suggestions. In: *The International Yearbook of Environmental and Resource Economics*. Edward Elgar, Cheltenham. VII.

UNCTAD (2010). *Non-tariff Measures: Evidence from Selected Developing Countries and Future Research Agenda*. United Nations publication. New York and Geneva.

UNCTAD (2015). *If you care about Least Developed Countries, care about Non-Tariff Measures.* – A technical note by the UNCTAD Secretariat. United Nations publication. New York and Geneva.

UNCTAD (2018). *UNCTAD TRAINS: The Global Database on Non-Tariff Measures. User Guide (2017, Version 2)*. United Nations publication. New York and Geneva.

UNCTAD (2019). *International Classification of Non-Tariff Measures (2019 Version)*. United Nations publication. New York and Geneva.

UNCTAD (2022). *Non-Tariff Measures from A to Z*. United Nations publication. New York and Geneva.

United Nations ESCAP and UNCTAD (2019). *Asia-Pacific Trade and Investment Report 2019: Navigating Non-Tariff Measures Towards Sustainable Development*.

UNCTAD and World Bank (2019). *The Unseen Impact of Non-Tariff Measures: Insights from a new database.* United Nations publication. New York and Geneva.

UNFCCC (2014). *Non-Market-Based Approaches*. Technical Paper. 24 November.

UNFCCC (2021). *Glasgow Climate Pact*. Decision -/CP.26. 13 November.

UNFCCC (2021a). Nationally determined contributions under the Paris Agreement. Synthesis report by the secretariat. FCCC/PA/CMA/2022/4. Sharm el-Sheikh. 26 October.

UNFCCC (2021b). Report of the forum on the impact of the implementation of response measures. Draft Text. Sharm el-Sheikh. 18 November.

United Nations (1998). Kyoto Protocol to the United Nations Framework Convention on Climate Change. Available at: https://unfccc.int/resource/docs/convkp/kpeng.pdf.

United Nations (2015). Paris Agreement to the United Nations Framework Convention on Climate Change. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf.

United Nations, General Assembly (2015). Transforming Our World: The 2030 Agenda for Sustainable Development. A/RES/70/1. 21 October.

Vanzetti D, Peters R and Knebel C (2016). *Sand in the wheels: Non-tariff measures and regional integration in SADC.* Policy Issues in International Trade and Commodities, Study Series No. 71. UNCTAD/ITCD/TAB/73. UNCTAD.

Vranes E (2010). Climate Labelling and the WTO: The 2010 EU Ecolabelling Programme as a Test Case under WTO Law. In: Hermann C and Terhechte J, eds. *European Yearbook of International Economic Law 2011.* Springer.

Wilson J and Tsunehiro O (2004). *Standards and Technical Regulations and Firms in Developing Countries: New Evidence from a World Bank Technical Barriers to Trade Survey*. World Bank. Preliminary Draft.

WTO (1994). WTO Agreement on Technical Barriers to Trade. First published by the GATT Secretariat.

WTO (1998a). *EC Measures concerning meat and meat products (Hormones).* Appellate Body Report. WT/DS26/AB/R. 13 February.

WTO (1998b). *United States – Import prohibition of certain shrimp and shrimp products*. Appellate Body Report. WT/DS58/AB/R. 12 October.

WTO (1999). *Korea - Taxes on alcoholic beverages*. Appellate Body Report. AB-1998-7. 18 January.

WTO (2001). *European Communities – Measures affecting asbestos and products containing* asbestos. Appellate Body Report. WT/DS135/AB/R. 5 April.

WTO (2002). *European Communities – Trade description of sardines*. Appellate Body Report. WT/DS231/R. 23 October.

WTO (2007). *Brazil – Measures affecting imports of retreaded tyres*. Appellate Body Report. WT/DS332/AB/R. 3 December.

WTO (2011). *United States – Measures affecting the production and sale of clove cigarettes.* Report of the Panel. WT/DS406/R. 2 September.

WTO (2012a). *United States – Measures affecting the production and sale of clove cigarettes*. Appellate Body Report. WT/DS406/AB/R. 4 April.

WTO (2012b). *United States – Certain Country of Origin Labelling (COOL) requirements*. Appellate Body Report. AB-2012-3. 29 June.

WTO (2012c). *United States – Measures concerning the importation, marketing and sale of tuna and tuna products.* Appellate Body Report. WT/DS381/AB/R. June 13.

WTO (2016). *India – Certain measures relating to solar cells and solar modules.* Appellate Body Report. WT/DS456/AB/R. 16 September.

WTO (2018a). *United States – Measures concerning the importation, marketing and sale of tuna and tuna products*. Appellate Body Report. WT/DS381/AB/RW/USA. 14 December.

WTO (2018b). *Australia – Certain Measures concerning trademarks, geographical indications and other plain packaging requirements applicable to tobacco products and packaging.* Report of the Panel. WT/DS467/R. 27 August.

WTO (2022). What yardstick for net-zero? How WTO TBT disciplines can contribute to effective policies on carbon emission standards and climate change mitigation. *Trade and Climate Change*. Information Brief n°6.

WTO/OECD (2019). *Facilitating trade through regulatory cooperation: The case of the WTO's TBT/SPS Agreements and Committees.*

WTO/UNEP (2009). *Trade and Climate Change.* Geneva.

Endnotes

1 The United Nations Framework Convention on Climate Change stipulated that only the countries listed in its Annex I (OECD countries and countries with economies in transition) have emissions reduction commitments.

2 Kyoto Protocol Article 3.

3 Paris Agreement, Articles 3-4.

4 *Ibid*.

5 Resilience can be defined as resilience "the capacity or ability to anticipate and cope with shocks, and to recover from their impacts" (LSE, available at https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-difference-between-climate-change-adaptation-and-resilience/

6 This report focuses on technical regulations and conformity assessment procedures and has therefore a more limited scope than the WTO treatment of technical barriers to trade, which also include standards.

7 The international classification of NTMs was developed by a Multi-Agency Support Team coordinated by UNCTAD and including the following institutions: Food and Agriculture Organization of the United Nations (FAO), International Trade Centre (ITC), Organization for Economic Cooperation and Development (OECD), UNCTAD, United Nations Industrial Development Organization (UNIDO), World Bank and WTO. The classification has been endorsed by the United Nations Statistical Commission for data collection across countries and for reporting on internationally comparable data on non-tariff measures.

8 See Introduction.

9 WTO https://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm

10 Over the period 2009–2021, 61.9 per cent of all environment-related notifications made to the WTO were linked to the TBT agreement. In 2009, 829 environment related measures were notified to the WTO; 69 of these notifications were climate change-related. In 2021, 2250 environment related measures were notified; 207 of these were linked to climate change (WTO environment database, available at https://edb.wto.org/notifications).

11 See also the Collaborative Labelling and Appliance Standards Program (CLASP) website, which provides a summary of standards and labelling programmes at https://www.clasp.ngo/.

12 See *e.g.*, UNFCCC, Article 3.5.

13 Standards are outside the scope of this report.

14 Measures "necessary to protect human, animal or plant life or health" are also included in the General Agreement on Trade in Services (GATS), General Exceptions (Article XIV).

15 See also WTO, 2016.

16 See TBT, Principles for the Development of International Standards, Guides and Recommendations. Available at https://www.wto.org/english/tratop_e/tbt_e/principles_standards_tbt_e.htm.

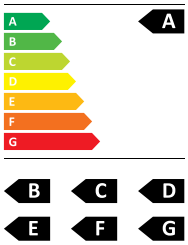
17 See also Gawel E *et al*. (2014).

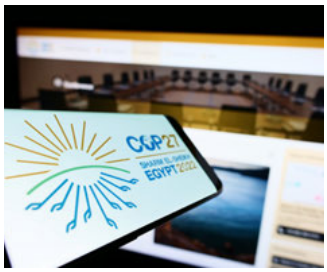
18 See also Russell C and Vaughan W (2004).

19 See also UNCTAD (2015).

20 UNFCCC (1992); Kyoto protocol (1997); Decision 5/CP.7 (2001); Decision 1/CP.10: Buenos Aires Programme of Work on Adaptation and Response Measures (2004); Decision 1/CP.16: The Cancun Agreements (2010); Decision 8/CP.17; Agreed Outcome Pursuant to the Bali Action Plan (2012); Paris Agreement (2015); and Decision19/CP.26 (2021).

21 These issues are still currently being discussed in different fora, such as the Forum on the impacts of the implementation of response measures under the Convention, Kyoto Protocol and the Paris Agreement, the Katowice Committee of Experts on Impacts of Implementation of Response Measures, and the Forum on Response Measures.





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