WORLD TRADE ORGANIZATION

TRADE AND CLIMATE CHANGE

Information brief n° 6

What yardstick for net-zero?
How WTO TBT disciplines can contribute to effective policies on carbon emission standards and climate change mitigation

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WHAT YARDSTICK FOR NET-ZERO? HOW WTO TBT DISCIPLINES CAN CONTRIBUTE TO EFFECTIVE POLICIES ON CARBON EMISSION STANDARDS AND CLIMATE CHANGE MITIGATION[1]

KEY POINTS

- Using different yardsticks for measuring carbon emissions makes comparisons difficult. Aligning methodologies for measurement may contribute to achieving climate goals by enabling fair comparisons and upholding the environmental integrity of emissions reductions. These efforts are supported by WTO rules and recommendations on standards and regulations.
- Robust verification increases trust; and trust is key for trade. It is essential that information provided by producers (about carbon content of products and processes) be underpinned by a system of verification and communication that provides confidence to the market. Confidence is also fostered by engaging with trading partners. WTO committee work, which is inherently multilateral and cooperative, can serve as a forum for early dialogue on emerging regulations to address climate change. This cooperation helps to facilitate the transition towards a low-carbon economy and to avoid unproductive trade frictions.
- Institutions and infrastructure underpin the verification process. Given how technical the field of carbon emissions quantification can be, it is paramount to provide support to developing countries so that they can accurately measure and verify the carbon content of their products, and reap the opportunities presented by a low-carbon economy. Strengthening national quality infrastructure in developing countries can help producers to integrate into green global value chains as part of a just transition to a low-carbon economy.

1 INTRODUCTION

Countries and companies around the world are making ambitious climate change mitigation plans to address the climate crisis and to reach net-zero emissions. This includes a range of market and non-market measures to decarbonize supply chains and to accelerate the transition to a low-carbon economy. Properly measuring the carbon emitted by companies, not only in their own operations but also upstream and downstream is a precondition for quantifying emissions under such measures. Only an accurate quantification will make meaningful comparison between goods – or between processes – possible. The functioning of carbon markets, including under article 6 of the Paris Agreement, depends on common metrics and measurement systems to ensure transparency, accuracy, completeness, comparability and consistency.[2] The accurate measurement of carbon emissions is a significant challenge due, among other things, to a wide variety of methodologies used.

Different methodologies can lead to credibility problems. At the opening of COP26, on 1 November 2021, United Nations Secretary General António Guterres stated: "There is a deficit of credibility and a surplus of confusion over emissions reductions and net-zero targets, with different meanings and different metrics. That is why … I will establish a Group of Experts to propose clear standards to measure and analyse net-zero commitments from non-State actors."[3] Internationally aligned, consistent standards are needed. Verifying that carbon quantification requirements have been complied with by the relevant actors will also be crucial. As companies around the world increase their efforts to decarbonize, it will also be important to be able to communicate carbon-related information across supply chains.

This paper examines how WTO principles on regulations, standards and conformity assessments can inform these efforts and help to avoid unproductive trade frictions that might result from different methodologies as members transition towards a low-carbon economy. In particular, the paper explores three areas in which the concepts embodied in the WTO's Agreement on Technical Barriers to Trade (the TBT Agreement) may be particularly relevant[4]:

- **Using the same yardstick**. TBT disciplines incentivize WTO members to align standards and regulations to common international standards. This incentive may contribute to members' climate goals by ensuring that effective methods are employed when measuring carbon emissions or a product's carbon content.
- **Verification and communication**. These same disciplines provide important guidance on the procedures members can use to verify and communicate the results of measurements along the value chain, including to the final consumer.
- **Development dimension**. To ensure credibility and legitimacy, it will be paramount to provide support to developing countries, not only to enhance their participation in the development of new relevant international standards but also in the application of existing ones. This is important because it may enable producers in these members to accurately measure the carbon content of their products. Significantly, this will involve the upgrading of their national quality infrastructures (NQIs).

2 USING THE SAME YARDSTICK

2.1 Different accounting methodologies create unpredictability

Members currently follow a range of market and non-market policies to reduce emissions. As part of their climate change mitigation plans and in line with the architecture of the Paris Agreement – and nationally determined contributions (NDCs) – members use a portfolio of approaches, such as carbon taxes, emissions trading systems and life cycle carbon footprint labelling. Governments increasingly mandate sustainability criteria for fuels or implement requirements to increase the energy efficiency of buildings. Many of these policies will include some requirements for measuring carbon emissions. These measurements might be with respect to the carbon content of products or at the level of emissions generated by facilities or organizations. These measurements, in turn, will likely rely on standards. Similarly, energy or fuel efficiency regulations, which may be applicable to appliances, electronics or cars, equally depend on standards for measuring and comparing performance.

If members use different yardsticks to make these measurements, global tracking and comparisons may be exceedingly difficult.

If members use different yardsticks to make these measurements, global tracking and comparisons may be exceedingly difficult. Put differently, situations in which climate change mitigation policies are based on different standards – and a wide variety of different carbon accounting methodologies for products, based on different standards, are used – can create unpredictability for producers and impose burdensome costs on them. Regulatory divergences across WTO members, especially when they rely on different standards as a basis, may unnecessarily restrict international trade. Indeed, under a scenario like this, a producer exporting to several markets may find itself in a situation in which it needs to adapt its carbon measurements to multiple methodologies.

Moreover, possible regulatory divergences can arise in terms of scope, for example determining which parts of a product's production cycle should be included in its carbon footprint and which greenhouse gas (GHG) emissions should be counted (e.g. CO_2, methane). Harmonizing standards can help to ensure comparability in these areas.

2.2 Which standard should be used?

Given the wide variety of policies that members may adopt for climate change mitigation purposes, international standards for measuring carbon emissions (or a product's carbon content) will play an important role in facilitating the transition to low-carbon economies across the world and in avoiding obstacles to trade. Ideally, approaches to measuring emissions should be based on international standards agreed by consensus; and these would provide a framework for all entities (public and private) to calculate carbon emissions or the embedded carbon in products.

The TBT Agreement strongly encourages the use of relevant international standards when enacting technical regulations.[5] Not only that, but the TBT Agreement lends a presumption of conformity to government measures that are in accordance with international standards. Thus, technical regulations in accordance with relevant international standards are, *a priori*, considered not to create unnecessary obstacles to international trade (article 2.5). In and of itself, this can be a strong incentive to use international standards as a basis for carbon measurement methodologies.

The manner in which international standards for measuring carbon are set will have a decisive impact on the extent to which those standards are actually used as a basis for convergence.

The manner in which international standards for measuring carbon are set will have a decisive impact on the extent to which those standards are actually used as a basis for convergence. In this regard, the TBT Committee has developed guidance on how best to develop such standards in the "Six Principles for the Development of International Standards, Guides and Recommendations" (see Box 1). Essentially, the Six Principles are intended to help international standards better facilitate global trade and to provide guidance in the areas of "transparency", "openness", "impartiality and consensus", "effectiveness and relevance", "coherence" and "development dimension".[6]

The Six Principles could play a significant role in the development of relevant international standards relating to carbon emissions quantification. For instance, observing the principles in this decision by the TBT Committee would ensure that relevant information be made available to all interested parties, that sufficient opportunities for written comments be provided and that conflicting international standards not be adopted; and, importantly, that constraints facing developing countries be considered (see Section 4).

Box 1: The Six Principles for the Development of International Standards, Guides and Recommendations

1. Transparency: All essential information regarding work programmes, as well as on proposals for standards, guides and recommendations under consideration and on 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.

2. Openness: Membership of an international standardizing body should be open on a non-discriminatory basis to relevant bodies of at least all WTO members.

3. 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.

4. 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.

5. 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.

6. 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.

Source: See https://www.wto.org/english/tratop_e/tbt_e/principles_standards_tbt_e.htm.

2.3 Some examples of standards for carbon emissions quantification

Numerous standards have already been developed for carbon emissions quantification, at both international and national levels (see Box 2 for information on carbon emissions). Some apply across the economy; others are sector-specific. A few examples are described below without prejudice to their relevance or non-relevance under WTO rules.

Box 2: What are carbon dioxide (CO_2) emissions?

CO_2 is a naturally occurring gas, that is also the by-product of burning fossil fuels (such as oil, gas and coal), of burning biomass, of land-use changes (LUC) and of industrial processes (e.g. cement production). It is the principal anthropogenic greenhouse gas (GHG) that affects the Earth's radiative balance. It is the reference gas against which other GHGs are measured.

Source: IPCC (2018).

At the international level, some standards provide overall guidance on calculating the carbon footprint of a product:

- ISO 14067:2018 sets out requirements and guidelines for quantification and reporting for the carbon footprint of a product, which helps to provide a better understanding of how to reduce the footprint.[7]
- ISO 14064-1:2018 (Greenhouse gases – Part 1) provides guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.[8]

- The Greenhouse Gas Protocol[9] has developed a series of standards to provide a framework for businesses, governments, and other entities to measure and report their GHG emissions. For instance, the GHG Protocol *Corporate Accounting and Reporting Standard* (see Box 3) provides guidance for companies and other organizations for undertaking a corporate-level GHG emissions inventory.[10] As a supplement to this standard, the GHG Protocol also developed the *Corporate Value Chain (Scope 3) Accounting and Reporting Standard*, which allows companies to assess their entire value chain emissions impact.[11] In addition, the GHG Protocol has developed the *Product Life Cycle Accounting and Reporting Standard*, which can be used to understand the full life cycle emissions of a product.[12]

Box 3: The GHG Protocol *Corporate Accounting and Reporting Standard*

The GHG Protocol *Corporate Accounting and Reporting Standard** classifies direct and indirect GHG emission sources into three "scopes" which companies or other organizations can use as a basis for accounting and reporting on emissions:

- Scope 1 includes direct emissions from sources that are owned or controlled by the company including vehicles, boilers and chemical production.
- Scope 2 refers to indirect emissions such as electricity purchased to be used by the company.
- Scope 3 refers to other indirect emissions which are linked to company activities but are not from sources that it owns or controls, such as the production and transportation of purchased goods.

The standard facilitates emissions calculations for GHGs listed in the Kyoto Protocol, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

It is indicated that emissions of each GHG are calculated separately and then converted to CO_2 equivalents on the basis of their global warming potential." The GHG Protocol website provides more detailed guidance and calculation tools, including for specific sectors.**

* See https://ghgprotocol.org/corporate-standard.

** See https://ghgprotocol.org/calculation-tools#sector_specific_tools_id.

At the national level, various standards have also been developed for carbon emissions measurement:

- In the United Kingdom, Publicly Available Specification 2050 (PAS 2050) was designed primarily for internal organizational assessment of supply chain emissions and "hot spots", as well as evaluating the impact of "changing materials, processes, distribution, use profiles and end of life", rather than for the purpose of product comparison.[13] PAS 2050:2011 builds upon international standard approaches to life cycle analysis (ISO 14040 and ISO 14044),[14] and tracks all GHGs specified by the Intergovernmental Panel on Climate Change, from "cradle to grave".[15] The more recent PAS 2060 standard, on carbon neutrality may also be relevant.[16]

- The standard Bilans GES (i.e. GHG assessment), developed by ADEME (Agence de la transition écologique) in France, offers guidelines and recommendations for organizations on determining and reporting on their GHG emissions (scopes 1, 2 and 3) in a manner consistent with the ISO 14064 set of standards.[17]

- The American Carbon Registry (ACR) developed the ACR Standard, which establishes specifications for the quantification, monitoring and reporting of project-based GHG emissions reductions and removals, verification, project registration and issuance of carbon credits. Adherence to the ACR Standard and associated methodologies will ensure that project-based offsets represent emissions reductions and removals that are real, measurable and verified by a competent, independent third party.[18]

There are also sector-specific standards that are tailored to calculate the carbon content in specific industry settings. For instance, European standard CSN EN 19694-2 provides a methodology for calculating GHG emissions and GHG performance in the steel industry[19], while the Cement CO_2 and Energy Protocol provides guidance for the cement industry (see Box 4).

Box 4: The Cement CO_2 and Energy Protocol: CO_2 and Energy Accounting and Reporting Standard for the Cement Industry

The Cement CO_2 and Energy Protocol was developed through the Cement Sustainability Initiative of the World Business Council for Sustainable Development (WBCSD) with support from the cement industry. It provides a methodology for calculating CO_2 emissions in the sector and can facilitate emissions reporting in accordance with Intergovernmental Panel on Climate Change requirements, national and regional GHG schemes, and the GHG Protocol. In the cement industry, some forms of direct and indirect GHG emissions include:

- Scope 1: Direct emissions (such as CO_2 from processing raw materials or from fuels and combustion sources, and non-CO_2 GHGs);
- Scope 2: Indirect emissions (from purchased grid electricity);
- Scope 3: Other indirect emissions (including from purchased clinker).

Further examples of emission sources within scopes 1, 2 and 3 in various sectors (iron and steel, pulp and paper, etc.) are included in the GHG Protocol *Corporate Accounting and Reporting Standard*.*

Source: WBCSD (2011).

* See https://ghgprotocol.org/corporate-standard.

The various types of standard for carbon emissions quantification (e.g. international, regional, national, sectoral) will of course overlap to some degree, as national standards bodies are themselves members of international bodies; often what emerges at the national level will filter up to regional and international levels. This means that coordination among national standards bodies is important as they form constituent parts of regional and international bodies. The Principle on Coherence developed by the TBT Committee (see Box 1) is therefore particularly important to avoid duplication and fragmentation of standardization work. Partly in recognition of this coherence challenge and attendant credibility problems, the "Our 2050 World" initiative of the International Organization for Standardization (ISO), the British Standards Institution and the United Nations-led Race to Zero campaign seeks to optimize the use of standards to support the low-carbon transition by encouraging more consistency in measurement and reporting across various types of standard that are about net-zero targets.[20]

2.4 In the absence of international standards

But what to do in the absence of harmonization? Such situations may arise, among other reasons, because countries have different levels of development and national capabilities to implement standards, or because a relevant international standard does not exist for an emerging technology.[21] In such situations, dialogue and cooperation to avoid unnecessary negative trade impacts may be particularly important. Regulatory cooperation between WTO members on a sector-by-sector basis may be an effective means of building trust between regulators and serve as an incubator for discussions at the multilateral level on emerging regulations.

Indeed, these types of discussion can contribute to members being made aware of each other's (different) systems. Similarly, the sharing of experience and expertise may, in a multilateral setting, help to bring approaches closer and eventually to enable them to converge, for instance in developing international guidance. Such guidance can then serve as a basis for either measurement or verification (see Section 3). It is notable that the WTO TBT Committee recently agreed (November 2021) to discuss regulatory cooperation on:

> "best practices related to technical regulations and standards, based on available scientific and technical information, and conformity assessment procedures that *support the attainment of environmental goals and contribute to addressing climate change*".[22]

2.5 Key message: Aligning standards will help members' climate change mitigation efforts

A key challenge is the use of different yardsticks. A wide variety of standards on the same subject matter may signal a lack of harmonization. The need for more harmonization of carbon emissions calculation methodologies has been highlighted by different stakeholders, including the private sector.[23] Aligning divergent methodologies for calculating emissions can contribute to achieving members' NDCs and net-zero goals, by ensuring that effective methods are employed, improving comparability and building trust. The TBT Committee's Six Principles can provide useful guidance to support WTO members' efforts to develop international standards in the area of emissions accounting methodologies. Indeed, in an unrelated field facing similar challenges (different yardsticks), the recently adopted G7 Trade Ministers' Digital Trade Principles make specific reference to the Six Principles as the basis for how international standards for information and communication technology should be developed to ensure coherence and inclusiveness.[24]

Aligning divergent methodologies for calculating emissions can contribute to achieving members' NDCs and net-zero goals, by ensuring that effective methods are employed, improving comparability and building trust.

3 VERIFICATION AND COMMUNICATION

3.1 Confidence promotes trade …

Trust in data, transparency and accountability are paramount. In the context of trade-related climate policies aiming to reduce carbon emissions, this means that information provided by producers on carbon emissions or the carbon content of products should be backed by a robust system of verification. Since it is not possible to "see" the carbon content in the product, communication of this information is essential. Such communication might take the form of a physical (or digital) label or documentation such as a declaration or claim at the end of the verification process, conveying that the conformity assessment has been completed successfully.

As mentioned above WTO members may, as part of their climate change mitigation plans, include some requirements for measuring carbon emissions. This section explores how such measurements can be verified. The TBT Agreement contains multiple disciplines that are about verification activities adopted by members. In TBT terms, when a member implements a verification procedure, it is referred to as "conformity assessment". A conformity assessment procedure is defined as "Any procedure used, directly or indirectly, to *determine* that relevant requirements in *technical regulations or standards* are fulfilled."[25] These procedures give consumers or buyers (whether final or along the value chain) the confidence that a product meets the necessary technical requirements set out in regulations or standards (e.g. quality, safety or environmental sustainability requirements). At the same time, it is also important to ensure that these procedures are not discriminatory and do not create unnecessary obstacles to trade.

3.2 … especially when based on common guides and recommendations, or …

Confidence in data about the carbon content of products as they cross borders and move through the value chain is essential. To engage in international trade, exporters may need to demonstrate the trustworthiness of their own carbon measurements and the underlying carbon quantification systems.[26] For instance, an accredited third party may be required to verify the carbon content of a product before it is imported into a country applying a trade-related climate policy. In this situation, the importing country applying the policy will need to trust the technical competence of the bodies and systems underpinning the carbon quantification systems in the exporting country.

To engage in international trade, exporters may need to demonstrate the trustworthiness of their own carbon measurements and the underlying carbon quantification systems.

Given the wide variety of verification procedures that members may adopt to ensure compliance with trade-related climate change measures, harmonized methods are again essential. WTO disciplines promote harmonization based on relevant guides or recommendations issued by international standardizing bodies as a means of avoiding unnecessary obstacles to trade. Harmonized procedures reduce differences in terms of the verifiers' competences and the verification approaches, which increases the overall quality of verification.

Numerous standards have been developed for verification activities relating to carbon emissions quantification. A few examples are described below without prejudice to their relevance or non-relevance under WTO rules. At the international level, some of these standards are:

- ISO 14065:2020 provides guidance for GHG validation and verification bodies for use in accreditation or other forms of recognition.[27] This standard specifies principles and requirements for bodies that undertake validation or verification of GHG assertions. It contains: (i) general requirements on competence, impartiality and legal organization of verification bodies; (ii) requirements on what procedures and management systems the verification body must set up and implement; and (iii) requirements on addressing appeals and complaints.

- ISO 14064-3:2019 provides guidance for the validation and verification of GHG assertions.[28] In particular, this standard specifies the minimum requirements for conducting any type of validation and verification activities in this field and covers: the principles of independence, ethical conduct, fair presentation and due professional care; and the structure of a validation or verification process, including key activities such as: (i) scope, criteria, level of assurance and materiality; (ii) planning for verification, sampling of the data universe and evidence requirements; (iii) assessing the GHG information management systems and controls; (iv) assessing the GHG data and associated information against specified criteria; (v) evaluating the assertion (data report) and evidence collected in order to form a conclusion on its validity.

- Other related standards include ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework (and supporting standards).

3.3 … through recognizing the conformity assessment results of other members

WTO disciplines encourage members to accept, whenever possible, the results of conformity assessment procedures performed by other members, even when those procedures differ from their own.[29] For example, the use of accreditation to verify compliance (using relevant guides or recommendations issued by international standardizing bodies) may be one option. Another option could be to use international accreditation systems (e.g. International Laboratory Accreditation Cooperation, International Accreditation Forum) as a basis for verification.[30] This allows a member to accept certificates, tests, and validation and verification statements issued by conformity assessment bodies accredited under the relevant framework that are located in another member.

The TBT Committee has provided guidance that WTO members can rely on when seeking to accept conformity assessment results of other members.

The TBT Committee has provided guidance that WTO members can rely on when seeking to accept conformity assessment results of other members. It has developed an Indicative List of Approaches to Facilitate the Acceptance of the Results of Conformity Assessment[31] covering a range of approaches that governments might choose to facilitate recognition:

(i) mutual recognition agreements for conformity assessment to specific regulations;

(ii) cooperative (voluntary) arrangements[32] between domestic and foreign conformity assessment bodies;

(iii) the use of accreditation to qualify (or recognize) conformity assessment bodies;

(iv) the designation by governments of specific conformity assessment bodies, including bodies located outside their territories, to undertake conformity assessment;

(v) a government's unilateral recognition of results of foreign conformity assessment;

(vi) the possibility of relying on the manufacturer's or supplier's declaration of conformity (SDoC) to the specified requirements.

WTO disciplines also govern the type of conformity assessment procedure that members may choose to ensure compliance with technical regulations that may be relevant to trade-related climate change measures. For example, the selected conformity assessment procedure should not be stricter, or be applied more strictly, than is necessary to give the importing member adequate confidence that products conform with the applicable technical regulations or standards.[33] Members should take this discipline into consideration when deciding whether to adopt a stricter procedure (e.g. third-party certification with full facility audit) or a less strict one (e.g. SDoC). The TBT Committee is currently developing non-

prescriptive practical guidelines to support regulators in the choice and design of appropriate and proportional conformity assessment procedures.

3.4 Communication

As mentioned above, it is generally not possible to "see" the carbon content in a product; so once the verification has been completed, the communication of this information along the value chain is essential to support low-carbon decision-making by market participants. One way to do this closely related to verification is through labelling. It is a very common measure[34] covered by the definitions of both "standards" and "technical regulations" in the TBT Agreement (Annex 1, paragraphs 1 and 2). As such, labelling measures should be based on international guidance where it exists. It should not be discriminatory, should not create unnecessary barriers to trade and may need to be notified to the WTO. The TBT Committee has specifically recommended that if a verification procedure results in a mandatory labelling requirement, it is subject to the notification provisions of the agreement regardless of the kind of information that is to be provided on the label.[35]

At the WTO, there have been discussions about the effectiveness of environmental labelling measures and how best to inform consumers through labels, for example of carbon footprint and environmental life cycle of products. Some of these discussions have taken place in the form of specific trade concerns (STCs) raised in the TBT Committee.[36] An example of an STC on timber is provided in Box 5.

Box 5: Green or red labels for timber*

Concerns were raised on a draft legislation requiring traders to apply a green or red mark on the packaging of wood products demonstrating whether it was sustainably produced or not.** It was indicated that this measure intended to protect the environment, and forests in particular.

WTO members raising concerns with this regulation had a preference for multilateral approaches to forest management and labelling. The proposed regulation was alleged to be inconsistent with various provisions of the TBT Agreement, for reasons such as:

- Terminology: differences relating to the use of domestic definitions or terms related to the sustainability of forests for which there were no internationally agreed definitions;
- Production methods: differences in forest management plans which take account of national or regional characteristics;
- Consumer information and unnecessary obstacles to trade: the measure could impose "unnecessary certification and labelling costs". The label would only indicate whether a formal certification defined and approved by one member had been adopted, "ignoring the fact that wood products could be sustainably produced without being certified";*
- Adaptation time and costs: the measure "neglected to give effect to Article 12 of the TBT Agreement, particularly with respect to paragraphs 2 and 3".*

This STC was last raised in November 2004 in the TBT Committee. Currently, under existing procedures, delegations are not required to inform other members about whether a solution is found.

* See TBT STC 31, *Netherlands - "Vos" Bill on Wood Products.*

** See *Notification*, WTO document G/TBT/Notif.98.448, 2 September 1998. Amendments to the regulation were notified in 2004 (*Notification*, WTO document G/TBT/N/NLD/62, 21 April 2004).

One key challenge is ensuring that labelling requirements are clear and credible and achieve the desired policy objectives without creating unnecessary obstacles to international trade. The information conveyed to consumers through labels should not create consumer confusion. The design of the labels should ensure that any claims they make are trustworthy. This is crucial to help consumers make informed choices. In adopting mandatory labels on carbon content, regulators may need to maintain a balance between the information requirements imposed on producers and the level of information ultimately communicated to consumers.

3.5 Verification and communication in the broader context of international trade

Of course, verification of emissions – and communication of information about such emissions with a label – is but one aspect of trading a low-carbon product across borders. For example, a small or medium-sized enterprise in a developing country or least-developed country (LDC) will face other hurdles in demonstrating carbon competitiveness. To begin with, manufacturing processes will need to adhere to relevant national rules, as well as the rules of the importing country. There may also be additional requirements (e.g. sustainability, traceability, due diligence) imposed by buyers or lead firms that condition access to the supply chain and must be met by manufacturers. Once the product is ready for export, the manufacturer or shipper may first need to provide the relevant authorities with the necessary documents (e.g. export licence or certificate). Certain procedures may need to take place prior to importation (e.g. obtaining an import licence), which may also require certification of conformity with technical regulations, or other verification. Upon reaching the country of importation, the product may be subject to various customs controls, and any import duties, charges or internal taxes may be levied (proof of origin and value of the shipment may also be necessary). Compliance with relevant technical regulations, including those requiring verification of emissions, may be conducted by customs in conjunction with other relevant authorities, and such information can also be used to inform the calculation of duties, charges or taxes, where relevant. Once the product clears the border, it will need to comply with all other domestic requirements and may be subject to post-market controls to protect consumers (i.e. verifying the accuracy of labels).

3.6 Key message: Trusting the data on carbon emissions reductions requires robust verification and communication systems

Aligning approaches to verification and its communication will increase the overall quality of verification through the value chain and boost confidence in the stated results of measurements.

Information provided by producers on the carbon content of products should be backed by a robust system of verification, clearly and effectively communicated along the value chain. Aligning approaches to verification and its communication will increase the overall quality of verification through the value chain and boost confidence in the stated results of measurements. Verification is also about engaging with trading partners. The WTO's TBT Agreement promotes dialogue by encouraging members to accept the results of procedures adopted by other members, even if they are different from their own. However, this assumes good dialogue, a degree of mutual trust and the existence of adequate institutions. Resources may be a constraint. The infrastructure that underpins an effective verification system is complex and technical, and for some governments perhaps prohibitively so. A deficient infrastructure to verify carbon emissions measurements may not only be an impediment to trade but could also counteract effective climate policy by preventing low-carbon solutions from having access to the market.

4 DEVELOPMENT DIMENSION

4.1 Specific challenges

When carbon standards and regulations are set, it is important to consider the development dimension. Developing countries face specific challenges and circumstances that may render compliance more difficult, and methodologies for calculating carbon content may need to take account, for example, of the production conditions and climates in different regions of the world. A well-developed NQI can help to surmount some of these limitations by generating data and supporting compliance, as can participation in the development of international standards.

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4.2 National quality infrastructure

A member's NQI contributes to providing confidence that goods meet specific requirements contained in standards and regulations. A study by the World Bank finds a positive correlation between the development of quality infrastructure and trade competitiveness.[37] At the WTO, the importance of NQI for trade is discussed, and it recognized that gaps in NQI may inhibit LDCs and developing countries from diversifying their trade to new markets.[38]

Having a good NQI is essentially about putting in place systems (public and private), policies and practices to support and enhance the quality, safety and environmental soundness of goods that are traded, whether at home or across borders. It relies on standardization, accreditation, conformity assessment, metrology and as well as market surveillance.[39] In a world in which countries are seeking to decarbonize their production and consumption, exporters will have to rely on a robust NQI system to measure and substantiate claims made about carbon efficiency. For instance, at the moment of clearing customs in the importing country, the authorities may need to verify whether the carbon data associated with the product is trustworthy (see Section 3.5).

In many LDCs and developing countries, there are gaps in the quality infrastructure ecosystem, which can become a bottleneck to decarbonization of supply chains. For example, this may stem from the absence (or poor performance) of NQI institutions, which in turn may lead to uncertainty about a product's compliance with relevant international standards (or any other requirement conditional for placement on the market); in other words, verification fails.

In many LDCs and developing countries, there are gaps in the quality infrastructure ecosystem, which can become a bottleneck to decarbonization of supply chains.

A robust NQI will help counter this problem. It plays an important role in supporting efforts to demonstrate the carbon content of products. In its absence, even carbon efficient producers may not be able to demonstrate this due to a lack of trust in the underlying data or excessive uncertainty about it. The lack of internationally recognized national institutions or systems, such as metrology, accreditation and standardization, may make it harder for trading partners to accept the veracity of carbon measurements claims. This may pose a significant barrier for those countries wishing to have their carbon quantifications recognized. In this sense, the lack of NQI is not only bad for development and trade but also, crucially, for the climate. This is because a deficient NQI may prevent the dissemination of low-carbon products and services that should, instead, be widely promoted.

Where NQI is deficient – or even non-existent – it may be possible for countries with limited resources to use the conformity assessment institutions of other countries (e.g. accreditation bodies), by, for instance, cooperating on a regional basis. This allows countries that do not yet have all their NQI institutions in place to rely on those of other countries, rather than building them from scratch.[40] Several examples exist. For instance, the West African Accreditation System is a multi-economy accreditation body serving eight countries[41] that enables laboratories across the region to obtain accreditation.[42] Cooperation on regional approaches also exists in the Caribbean and Pacific regions.[43] The importance of regional cooperation on quality infrastructure has been emphasized at the WTO. For instance, it was noted in 2019 that pooling resources and promoting alignment of national regulatory approaches promotes recognition and trade.[44] In 2020, it was indicated that regional integration on quality infrastructure is a means to facilitate trade and to enhance the quality of products.[45] Discussions have also identified certain challenges to regional integration, such as differences among regional partners in terms of the level of NQI development and lack of awareness among regulators with regard to the importance of NQI.[46]

4.3 Standards can disseminate crucial knowledge needed for the climate transition

The use of relevant international standards can support members that have limited resources since domestic legislation can build on these standards, thereby requiring fewer resources in the regulatory process.

Standards are an important part of the NQI because they are the basis on which regulations are developed. The use of relevant international standards can support members that have limited resources since domestic legislation can build on these standards, thereby requiring fewer resources in the regulatory process.[47] For example, once a Codex standard has been set (often after many years of discussions at the international level) for a particular maximum residue limit, all that work need not be repeated at the national level. Legislation can be developed using that standard as the starting point in the knowledge that it is likely to provide adequate protection. Similarly, in terms of verification, basing conformity assessment procedures on guides or recommendations issued by international standardizing bodies can result in tangible benefits for members, in particular, LDCs and developing countries. This means that both in the case of standards and verification, LDCs and developing countries do not have to reinvent the wheel: there is knowledge embodied in the development process of international standards that can be drawn on directly.

Nevertheless, it is important to participate in the development of international standards. The risk, otherwise, is that standards may not adequately reflect the national (or regional) context or particular challenges.[48] Discussions in the WTO Committee on Trade and Environment have highlighted a variety of concerns with respect the "non-neutrality" of standards, such as the use of carbon measurement methodologies that favour temperate climates over tropical ones, or the choice

of productionbased carbon accounting over a consumption-based approach.[49] Similar concerns have been raised in the TBT Committee with respect to certain trade-related climate policies.[50]

Resource limitations are one impediment to participation in international standards development by developing countries and LDCs. While the shift to virtual meetings generated by the COVID-19 pandemic has helped to ease some barriers (owing to the costs of travel to meetings), gaps in human resources and expertise persist. This can mean that national standards bodies in developing countries are not able to gather and present all the data that they need to make their case and to defend their national interests in the international (or regional) standardization arena. Moreover, as discussed above, gaps in the NQI of developing countries are a further obstacle to effective participation in international standardization. This is because when the relevant pillars of the NQI are not in place, there is often a deficit of expertise or experience in using standards and performing verification procedures.

The last of the Six Principles is about the development dimension (see Box 1). It stresses the importance of considering the constraints on developing countries to effectively participate in standards development, and the need to find tangible ways of facilitating developing countries' participation in international standards development. Moreover, the TBT Agreement itself requires WTO members to recognize the special needs of developing countries and LDCs and allows them to request technical assistance for the implementation of the Agreement (articles 11 and 12). Technical assistance may be indispensable in various areas relating to ensuring compliance with trade-related climate policies, such as methods for carbon emissions measurement, accreditation of conformity assessment bodies, and effective participation in international or regional systems for conformity assessment.

4.4 Key message: Ensuring a just and efficient transition to a low-carbon economy requires supporting the development of NQI in developing countries and LDCs

One key component of reducing carbon emissions through trade-related climate policies is the ability to effectively demonstrate compliance with such policies. Given how technical the field of carbon emissions quantification can be, it will be paramount to provide support to developing countries and LDCs, and their companies (particularly small or medium-sized enterprises), so that they can effectively participate in the setting of relevant international standards, as well as accurately verify the carbon content of their products. This will help them to properly account for carbon emissions in a just transition to a low-carbon economy. Indeed, adequate quality infrastructure institutions will signal compliance and boost engagement in trade, helping producers from developing countries to integrate into green global value chains.

5 CONCLUSION

This paper has examined how some of the principles embodied in WTO disciplines on regulations, standards and conformity assessment could help to facilitate the transition towards a low-carbon economy and to avoid unproductive trade frictions. In particular, the paper explores the areas of standards, verification and communication, and the development dimension. The following conclusions can be drawn:

- **Measurement coherence is key.** Accurate measurement will enable the quantification of emissions from traded goods and this in turn will make comparisons possible. Because a wide variety of standards exist, a key challenge is harmonization of measurement methodologies. In other words, using the right yardstick for calculating emissions may contribute to achieving members' NDCs and net-zero goals by ensuring that effective methods are employed, improving comparability and building trust. If members and their stakeholders choose to undertake further work to align to common international standards, the Six Principles can provide useful guidance in support of these efforts.

- **Robust verification increases trust.** Information provided by producers on the carbon content of products should be backed by a robust system of verification and communication. Aligning approaches will increase the overall quality of verification through the value chain and boost confidence in carbon efficiency claims. Verification is also about engaging with trading partners. The WTO's TBT Agreement promotes dialogue by encouraging members to accept the results of procedures adopted by other members even if they are different from their own. The TBT Committee provides a multilateral forum for dialogue on emerging regulation.

- **Inclusiveness.** Robust verification assumes good dialogue, a degree of mutual trust and the existence of adequate institutions. The infrastructure that underpins an effective verification system is complex and technical, and for some governments perhaps prohibitively so. Given how technical the field of carbon emissions quantification can be, it will be paramount to provide support to developing countries so that they can accurately verify the carbon content of their products. Adequate NQI institutions will signal compliance and foster engagement in trade, helping producers to integrate into green global value chains.

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ENDNOTES

1 This is an information note which represents research in progress. The opinions expressed in this paper are those of its authors. They are not intended to represent the positions or opinions of the WTO or its members and are without prejudice to members' rights and obligations under the WTO. Any errors are attributable to the authors. The note was written by Mateo Ferrero, Devin McDaniels, Nazia Mohammed and Erik Wijkström.

2 International Institute for Sustainable Development, The Paris Agreement's New Article 6 Rules (13 December 2021), available at: https://www.iisd.org/articles/paris-agreement-article-6-rules.

3 See https://www.un.org/sg/en/node/260423.

4 The analysis presented in this paper does not address, and is without prejudice to, whether any particular measures or type of measures are or are not subject to the disciplines of the TBT Agreement.

5 The TBT Agreement provides that, where international standards exist or their completion is imminent, WTO members shall use them, or the relevant parts of them, as a basis for their technical regulations. An exception is when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued by the measure (article 2.4).

6 See Decisions and Recommendations Adopted by the WTO Committee on Technical Barriers to Trade since 1 January 1995, WTO document G/TBT/1/Rev.14, pp. 62-64.

7 ISO 14067:2018, Greenhouse Gases: Carbon Footprint of Products – Requirements and Guidelines for Quantification. This standard has been discussed both in the TBT Committee and the WTO Committee on Trade and Environment (CTE). For the TBT Committee, see TBT STC 591, European Union – Product Environmental Footprint Category Rules (PEFCR). Delegations discussed the methods used to determine the environmental footprint, noting that there were differences in the plant and harvesting cycles of trees in tropical countries. In the CTE, this standard was discussed even before it was adopted in 2018, when it was ISO/TS 14067:2013 (see Report of the Meeting held on 20 June 2017, WTO document WT/CTE/M/63, 27 September 2017, paragraphs 1.78–1.88). Even before that, carbon footprint methodologies were discussed at a special event of the CTE in 2010 (see Summary Report of the Information Session on Product Carbon Footprint and Labelling Schemes 17 February 2010, WTO document WT/CTE/M/49/Add.1, 28 May 2010).

8 ISO 14064-1:2018, *Greenhouse Gases: Part 1. Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals* (see also ISO, 2019).

9 The GHG Protocol establishes comprehensive, global standardized frameworks to measure and manage GHG emissions from private and public-sector operations, value chains and mitigation actions. The GHG Protocol was created through a partnership between the World Resources Institute and the World Business Council for Sustainable Development.

10 See https://ghgprotocol.org/corporate-standard.

11 See https://ghgprotocol.org/standards/scope-3-standard.

12 See https://ghgprotocol.org/product-standard.

13 PAS 2050:2011, *Specification for the Assessment of the Life Cycle Greenhouse Gas Emissions of Goods and Services*. Product comparison enables consumers to choose between like goods produced by different firms. It follows that ranking based label or comparison focused label would not be readily developed from this standard.

14 ISO 14040:2006, *Environmental Management: Life Cycle Assessment – Principles and Framework*; ISO 14044:2006, *Environmental Management: Life Cycle Assessment — Requirements and Guidelines*.

15 It is important to note that the notions of "cradle" and "grave" are relative and may differ in important ways from one methodology to another. For example, emissions associated with the production of capital goods used in production, emissions from soil carbon, and consumer and employee transport emissions are not included in the scope of PAS 2050:2011 (Plassmann, *et al*., 2010).

16 See https://www.bsigroup.com/en-GB/pas-2060-carbon-neutrality.

17 See https://pre-sustainability.com/articles/lca-standards-and-guidelines/#h-1-product-standards-and-guidelines.

18 See https://americancarbonregistry.org/carbon-accounting/standards-methodologies/acr-validation-and-verification-standard-1.

19 See European Commission (2021: 20-21).

20 See https://our2050.world and https://www.iso.org/news/ref2751.html.

21 In the absence of an international standard, it is always possible to bring proposals (for new or adjusted standards) to the table. For developing countries, however, there may be resource constraints to do so. Therefore, capacity building to initiate international standards work may be important. This is addressed under the "development dimension" (see Section 4.3).

22 *Ninth Triennial Review of the Operation and Implementation of the Agreement on Technical Barriers to Trade under Article 15.4*, G/TBT/46, 17 November 2021, p. 7.

23 See https://www.wto.org/english/tratop_e/envir_e/trade4climate_e.htm#summaries.

24 The G7 Trade Ministers' Digital Trade Principles states that "International standards for information and communication technologies should be developed in a way that complies with the six principles of the WTO Technical Barriers to Trade Committee, namely transparency, openness, impartiality and consensus, effectiveness and relevance, coherence, and the development dimension. Such standards must continue to play an important role in supporting an open, free, and fair environment in the digital age." (see https://www.gov.uk/government/news/g7-trade-ministers-digital-trade-principles).

25 TBT Agreement, Annex 1, paragraph 3. This definition also specifies that "Conformity assessment procedures include, *inter alia*, procedures for sampling, testing and inspection; evaluation, verification and assurance of conformity; registration, accreditation and approval as well as their combinations" (explanatory note to paragraph 3).

26 Other aspects beyond verification will be necessary for a low-carbon product to be traded internationally. Some of these are further elaborated in Section 3.5.

27 ISO 14065:2020, *General Principles and Requirements for Bodies Validating and Verifying Environmental Information*.

28 ISO 14064-3:2019, *Greenhouse gases: Part 3. Specification with Guidance for the Verification and Validation of Greenhouse Gas Statements*.

29 TBT Agreement, Article 6.1.

30 TBT Agreement, Article 5.4.

31 See WTO document G/TBT/1/Rev.14, pp. 60-61.

32 These cooperative arrangements include arrangements among accreditation bodies, as well as arrangements between individual laboratories, between certification bodies, and between inspection bodies. (WTO document G/TBT/1/Rev.14, p. 60).

33 TBT Agreement, Article 5.1.2.

34 In 2020, labelling appeared in more than half of all new specific trade concerns (STCs) raised at in the TBT Committee (*Twenty-sixth Annual Review of the Implementation and Operation of the TBT Agreement*, WTO document G/TBT/45, 18 February 2021, para. 4.20).

35 The operative provision is article 2.9 of the TBT Agreement. For the specific notification mentioned, see WTO document G/TBT/1/Rev.14, Section 6.3.1.5 Notification of labelling requirements (originally in: *Minutes of the Meeting Held on 14 July 1995*, WTO document G/TBT/M/2, 4 October 1995, para. 5; *Updating the Decisions and Recommendations Taken by the Tokyo Round Committee on Technical Barriers to Trade Regarding Procedures for Notification and Information Exchange*, WTO document G/TBT/W/2/Rev.1, 21 June 1995, p. 10).

36 In essence, the STC process allows WTO members to raise in the TBT Committee issues with respect to other members' TBT measures that affect trade. Through this process, members usually seek to pose questions in light of the core TBT obligations and find out more about the scope and implementation of specific TBT measures. Most of the TBT measures discussed in STCs have not yet been adopted (i.e. comments can still be made), but STCs can also pertain to existing measures. To date, more than 700 STCs have been raised for discussion in the TBT Committee (see www.wto.org/english/tratop_e/tbt_e/tbt_e.htm).

37 Kellermann, M. (2019), *Ensuring Quality to Gain Access to Global Markets: A Reform Toolkit*, Washington, D.C./Braunschweig: World Bank/Physikalisch-Technische Bundesanstalt pp.25-26.

38 See *Thematic Session on Conformity Assessment Procedures: National Quality Infrastructure*, WTO document G/TBT/GEN/278, 5 December 2019. Notably, the July 2019 Global Aid for Trade review saw six sessions devoted specifically to NQI-related matters.

39 One such definition is provided by the International Network on Quality Infrastructure, available at www.inetqi.net. See also the TBT Committee's discussion on this topic, in particular in WTO document G/TBT/GEN/278, paragraph 1.4.

40 World Bank (2019), *Designing Accreditations and Verifications Systems: A Guide to Ensuring Credibility for Carbon Pricing Instruments*, Washington, D.C.: World Bank, pp. 57-59.

41 Under the auspices of the West African Economic and Monetary Union: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

42 For more information, see *Recent Activities by UNIDO – Information Provided to the TBT Committee by the United Nations Industrial Development Organization*, WTO document RD/TBT/276, 6 March 2019.

43 For the Caribbean region, regional initiatives under the auspices of the Caribbean Community (CARICOM) Regional Organization for Standards and Quality (CROSQ), see WTO document G/TBT/GEN/278, paragraph 1.11. For the Pacific region, see the description of experience sharing on quality infrastructure systems in Pacific Island Countries and the promotion of institutional partnerships on quality infrastructure, including efforts to establish a network of NQI focal points and the development of a regional quality policy and concept note to outline the Pacific quality infrastructure strategy (WTO document G/TBT/GEN/278, paragraph 1.24).

44 See WTO document G/TBT/GEN/278, paragraphs 1.26-1.35.

45 *Thematic Session on Technical Assistance – Moderator's Report*, WTO document JOB/TBT/381, 29 October 2020.

46 See WTO document G/TBT/GEN/278, paragraphs 1.26-1.35.

47 World Bank (2019), *Designing Accreditations and Verifications Systems: A Guide to Ensuring Credibility for Carbon Pricing Instruments*, Washington, D.C.: World Bank, pp. 57-58.

48 Article 2.4 of the TBT Agreement provides some flexibility in situations where an international standard would not be effective or appropriate for a specific member's needs, for instance due to fundamental climatic or geographical factors or fundamental technological problems.

49 See *Report of the Meeting held on 20 November 2009*, WTO document WT/CTE/M/48, 12 January 2010, and WTO document WT/CTE/M/63.

50 For example, see statements in TBT STC 553, *European Union – Amendments to the Directive 2009/28/EC, Renewable Energy Directive*, TBT STC 408, *United States – EPA Palm Oil Biofuels Regulatory Program*, and TBT STC 323, *United States – Energystar 6.0 Draft 2 Program Requirements for Displays, Draft Partner Commitments*.

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