

Trade in a World Where Goods Carry Carbon Passports

Ricardo Meléndez-Ortiz¹, formerly, International Centre for Trade and Sustainable Development

Carbon dioxide emissions into the global atmosphere are the primary source of climate change and the associated risks to the planet's sustainability. In a world of rising commitments to reverse the build-up of greenhouse gas emissions and to rally behind the ultimate goal of stabilizing the planet, goods moving to and from jurisdictions with diverse climate change policies and energy structures may need to reveal where they are from and what they are made of as a way to validate their consistency with both national and global climate change action commitments. Requiring internationally traded goods to carry a "carbon passport" containing such information could help to build a climate-friendly global economy grounded on well-informed markets that have reliable data on the greenhouse gas (GHG) emissions embodied in goods – tracked throughout their supply chains and across borders.

To make the trading system reinforce – and not undermine – the global response to climate change, we need all goods moving across borders to be identified in ways that reflect their GHG emissions impact: the balance between emissions caused over their relevant production and processes, plus or minus their respective GHG cost internalization efforts.

Carbon passports aim to remedy a critical information failure in relation to traded goods – notably, helping buyers to better understand how aligned the products they are purchasing are with global (and national) climate change action commitments. This information can both influence purchasing decisions and enable differential treatment of goods in international trade based on their GHG emissions profiles. For effective and urgent

GHG mitigation, carbon passport initiatives could be initially focused on a selection of commodities and heavily traded goods with high carbon emission profiles.

So far, multilateral trade frameworks have remained largely unresponsive to the rising sense of urgency related to the climate change challenge. This result can be traced to several causes. First, the trade community has failed to develop rules or modalities to differentiate among products based on their GHG emissions – now an imperative as this paper explains. Second, trade negotiations to develop new market access conditions and possible rules to incentivize technology transfer and cooperation in support of climate change mitigation and adaptation strategies have lingered inconclusively for nearly two decades. More recently, trade policy makers have been unable to agree on disciplines that mandate the phase-out of fossil fuel subsidies despite a broad-based consensus established in 2008 in support of this action item.

The idea that the GHG emissions “profile” of goods moving in trade should be made transparent has been under discussion for more than a decade.² The proposal for a carbon passport would not fully “internalize” climate change harms into the price of the goods, but it would begin to address the information failures underlying the inability of markets to reflect through price signals the full costs attributable to climate change damage.

At the heart of the passport concept is the hope that the information provided might incentivize innovation and changes in production and consumption patterns by clearly differentiating between otherwise directly competing goods.

Notwithstanding the announced intention of the United States to withdraw from the Paris Agreement, we now find a broad societal consensus to expeditiously explore all possible paths to stabilize and phase out carbon emissions. In addition, there does not seem to be an excuse any longer for policy making to evade the obvious need to purposefully align to the climate change imperative the frameworks governing the global economy.

The science on climate change has made great strides. The technology to gather and manage relevant complex data and to trace emissions along the full value chain—from sourcing of inputs to consumption—has become far more accessible and precise. The economic modeling and understanding of production- and consumption-based emissions is leapfrogging. Moreover, and most encouraging, trade law reveals a steady path of evolution. Such impressive advancements in these four areas, coupled with commitments in and around the Paris Agreement, have occurred in a direction that gives us hope that governance of trade in goods can indeed be organized to favor the planet and future generations.

In making the case for carbon passports, this paper begins with a review of the concept of embedded carbon in international trade and illustratively reviews existing schemes aimed at tackling embedded carbon. It then presents a brief analysis of the evolution of multilateral trade law governing the differentiation of products based on labeling, reflecting processes and production methods. To conclude, it makes the case for a proposed carbon passport approach and presents its possible key elements.

Embedded Carbon in Trade

“Embedded carbon” is a term used to describe the carbon emissions associated with the manufacturing of a good. A related, but different, concept is “carbon footprint,” which looks at the carbon emissions throughout the life cycle of a product or service. The amount of embedded carbon that moves between nations, effectively the flow of emissions from producing to consuming countries, has increased in tandem with trade growth. Current mainstream accounting uses emissions arising from production within a specific country (so-called territorial emissions), rather than emissions associated with the country's consumption. Although the UN Framework Convention on Climate Change (UNFCCC) and policy making more generally use production-based accounting (due, among other reasons, to the challenges

of measuring consumption-based emissions), solely using a production-based approach misplaces accountability for emissions, misrepresents the weight of consumption as a critical driver, and neglects carbon embeddedness. More importantly, such a narrow approach eschews mitigation options along the product value chain, as well as at the point of final consumption and use.

China is now the largest net exporter of embedded carbon in volume, equivalent to nearly 1.6 billion tons of embedded carbon dioxide in 2015. The second largest, Russia, exports only one-fifth of China's volume. India, Iran, and South Africa are the remaining top five net exporters. The United States is the highest net importer of embedded carbon at around 500 million tons, nearly twice as much as the second largest, Japan, which is followed by the UK, Italy, and France.³ China's carbon exports are mostly embedded in machinery; electronics; apparel; textiles; chemical, rubber, and plastic products; and intermediate goods. The main net imports of carbon into the United States are machinery; electronics; motor vehicles and parts; chemical, rubber, and plastic products; apparel; and intermediate goods.⁴

Tracing GHG emissions as goods move around the globe provides critical information to firms, consumers, and governments in their efforts to tackle climate change. It also has several policy implications of relevance to a carbon passport approach. Notably, a key lesson from our existing capacity to track emissions is that firms make choices, as do consumers, that affect the geographic distribution of emissions around the globe. Further, governments, firms and consumers would benefit from being able to spot more easily possible points of intervention to address these emissions. At present, however, embedded carbon in international trade is mostly unpriced and unregulated – causing suboptimal or perverse production and consumption decisions and contributing to trade patterns that lead to unnecessary emissions. The concept of carbon passports provides an opportunity to overcome

this tendency by using disclosure of information on embedded carbon to affect consumers' purchase decisions, which will in turn send back signals to producer and supplier firms.

Existing Initiatives

Currently, uncoordinated action on the part of governments, intergovernmental organizations, businesses, and civil society has resulted in a wide range of initiatives to address carbon emissions from both consumption and production perspectives. The objectives of these initiatives include differentiating products and services by the level of embedded carbon or broader life cycle carbon footprint; raising the awareness of consumers, firms, and governments about their responsibilities towards climate protection; and encouraging stakeholders to choose products and services associated with fewer carbon emissions. Some initiatives respond to consumer needs (whether households, firms or public entities) by providing more information about embedded carbon, while others aim to guide consumers and producers to make climate-friendly decisions.

In terms of legal status, some initiatives are voluntary efforts developed or operated by businesses, retailers, or civil society associations, while others are mandatory product category rules, usually developed directly by governments and regional and intergovernmental organizations. Many initiatives are related to embedded carbon or the life cycle carbon footprint of specific products and services, while others focus on the carbon performance of companies, organizations, and projects.

Among voluntary initiatives, "food miles" labels (including airfreight stickers in the United Kingdom), and schemes such as "Approved by Climatop" in Switzerland and "Climate Certification for Food Standards" in Sweden, have largely targeted the final consumer and demonstrate the difficulty of reaching consensus on broadly accepted methodologies.

Voluntary reporting and standards for companies, organizations, and projects that target supply chain and large-scale purchases have also developed significantly. Examples include the "Greenhouse Gas Protocol" developed by the World Business Council for Sustainable Development and World Resources Institute, which published the first non-governmental international standard on greenhouse gas accounting and reporting in 2011. Another example is the "Stop Climate Change Standard," designed and operated by a German not-for-profit institution.

In terms of mandatory requirements, there has been tremendous growth in government-led methodologies and standards for "carbon footprinting." For example, France's BPX 30-323 is a general environmental footprinting methodology with product category rules for certain consumer goods sectors based on a stakeholder platform that includes more than 600 organizations and experts. Japan and South Korea have spearheaded the promotion of carbon footprinting standards in East Asia, e.g., Japan's "Carbon Footprint Programme" and South Korea's issuance of two sets of carbon labeling: the "Carbon Emission Certification" and the "Low Carbon Product Certification."

At the intergovernmental level, two breakthroughs are worth highlighting. In 2017, the International Civil Aviation Organization adopted a new aircraft carbon dioxide emissions standard, which represents the world's first global design certification standard governing carbon dioxide emissions for any industry sector. The standard applies to new aircraft designs starting in 2020 and to aircraft types in production as of 2023. In-production aircraft that do not meet the standard by 2028 will no longer be allowed. The second breakthrough was a full-fledged standard from the International Organization for Standardization (ISO), ISO 14067, on the carbon footprint of products. As of June 2018, 85 percent of member bodies of the ISO had approved Final Draft International Standard (FDIS) 14067, published as an international standard in August 2018.⁵

Beyond framework methodologies, various initiatives tackle green procurement practices by governments that also incorporate carbon dioxide emission standards. Notable in this field is the wide-reaching European Union directive governing the use of ecolabels in public procurement, based on life cycle assessment and scientific evidence. Around infrastructure, the Dutch Ministry of Infrastructure and the Environment developed a methodology for projects that uses DuboCalc, a software tool that calculates the environmental impact of construction materials, including the embedded impacts from raw material extraction and production up to and including demolition and recycling.⁶

Table 4.1: Selection of initiatives aimed to support no or low carbon emissions in production and consumption

	Voluntary	Methodology/product category rules	
	Business and civil society associations	Government or public authorities	Regional and Intergovernmental
Embedded carbon or life cycle carbon footprint of products or services	<ul style="list-style-type: none"> • Food miles labels by European retailers. 	<ul style="list-style-type: none"> • Publicly Available Specification 2050, UK • BPX 30-323, France • Carbon Footprint Programme, Japan • Carbon Emission Certification and Low Carbon Product Certification, South Korea 	<ul style="list-style-type: none"> • Ecolabel criteria in Procurement Directives, EU • ISO 14067 Greenhouse gases-Carbon footprint of products, ISO • New aircraft carbon dioxide emissions standards, ICAO
Carbon footprint of companies, organizations, or projects	<ul style="list-style-type: none"> • Greenhouse Gas Protocol • Stop Climate Change Standard 	<ul style="list-style-type: none"> • 100% sustainable procurement in infrastructure projects, the Netherlands 	<ul style="list-style-type: none"> • Product Environmental Footprint methodology, EU

A central challenge for policy makers, firms and consumers is that the array of current embedded carbon initiatives is disjointed and lacks methodological harmonization. Given the internationalization of markets, the fragmentation of production, and the dispersion of supply chains across borders, this lack of harmonization compromises the aggregate effectiveness of existing initiatives. The lack of harmonization of existing embedded carbon initiatives, the complexity of measurement and data collection processes, and the high costs of certification confuse buyers of intermediate goods as much as consumers of final products and may be inadequate or particularly onerous for exporters based in developing countries.⁷

More generally, the complexity of calculating embedded carbon can lead to insufficient climate change action aimed at reducing the carbon footprint of products—with countries looking at more straightforward ways of meeting their domestic emissions targets, including by reallocating emissions by importing carbon-intensive products. Further, the lack of a focused approach to addressing embedded carbon at the international level results in distortions to competitiveness that risk undermining efforts to mitigate climate change by ambitious actors.

Concerns about “carbon leakage”⁸ and reduced competitiveness in high-ambition countries has increasingly led to proposals for statutory action to introduce border carbon adjustments (BCA).⁹ Such measures provoke considerable debate about their desirability and feasibility, with proponents underlining the concern that “current World Trade Organization (WTO) rules (and their interpretation in dispute cases) leave sufficient ambiguity to make it difficult to design appropriate policy measures that are safe from legal challenge.”¹⁰

An alternative proposition is to extend product carbon footprint standards imposed on domestic producers to importers. That would require clarity on the legal possibilities to discriminate with respect to market access conditions on the basis of information carried by the product revealing its characteristics. In this respect, interpretation of WTO law has

evolved considerably, as we argue below, and compatibility of such measures would much depend on their design. So far, most product carbon footprinting schemes appear to have relied on consumer feedback/demand and focused on food and agricultural products as opposed to consumer durables, components of assembled goods, or energy-intensive products and commodities (such as aluminum, chemicals, glass, metal casting, pulp and paper, and steel) that form a sizeable part of international trade.

Currently, several economies at both national and sub-national levels are operating emission trading schemes that allow producers in greenhouse gas intensive sectors to offset their emissions. These schemes often grant free allowances to firms to preserve their competitiveness in the domestic market. From a global perspective, however, this is a rather opaque action as it does not provide essential information on the emissions embedded in otherwise similar products as they move across jurisdictions. Similar products originating in separate territories with different or no carbon pricing regimes can continue to carry emissions for which the carbon cost may or not have been already captured.

A further yet unaddressed dimension is the effect on climate action ambition derived from the complexity of import and export transactions in internationally fragmented supply chains, through which goods cross borders multiple times as they gather components and tasks towards their finalization. Similar goods may be assembled from various combinations of components manufactured in jurisdictions with uneven or nonexistent carbon pricing regimes. It is safe to assume from decades of debate and surveys on these matters that fears of losing competitiveness in the absence of instruments or policies that guarantee a level global playing field impinge on a higher ambition on climate change mitigation.

Cracking the Hard Nut: Differentiated Treatment of Products under Existing Trade

Law¹¹

At least in the near term, the viability of a solution to the information asymmetry on carbon costs in international markets requires grounding in, and compliance with, the existing principles of non-discrimination in WTO law. It should also ensure coherence with all other relevant frameworks on trade and investment, whether bilateral, regional, or plurilateral trade agreements. Therefore, a carbon passport approach should be based on, and take advantage of, the evolution of established law.

In this regard, we review the matter of labeling, a critical component of carbon passports, particularly as it pertains to differentiation of otherwise substitutable and directly competing goods. Labeling would include any scheme providing information to differentiate products participating in international trade that aims to affect purchasing decisions.

Several issues arise:

- Products bearing the label in question may gain a competitive advantage over ineligible ones. If most of the products that are eligible to use or bear the labels are domestic, is there hidden discrimination against imported products?
- Compliance with labeling requirements of importing countries could trigger more documentation burdens or even changes in factory production lines.
- Are increased trade costs of this sort acceptable, especially when they are not borne equally by all players in the supply chain?
- If products from different countries are subject to dissimilar verification and monitoring mechanisms, would this lead to a discriminatory outcome?
- As WTO law provides some regulatory leeway for achieving public policy goals, could labeling schemes be justified for this reason?

Climate change-related labeling measures have not yet been challenged in the WTO. However, WTO adjudicators have assessed labeling measures related to public health and animal welfare. The findings and legal analyses deployed in these cases are good guidance for the current viability of a carbon passport approach, and are succinctly examined below.

The Technical Barriers to Trade Agreement

The General Agreement on Tariffs and Trade (GATT) and the WTO's Technical Barriers to Trade (TBT) Agreement contain most-favored-nation provisions, which require that countries treat imports no less favorably than "like" domestic products or "like" products from a third-party country member. A threshold question is whether a carbon passport label could be challenged under the TBT Agreement as a technical regulation. It appears that it could be.

The TBT Agreement has three criteria for establishing technical regulations: the document must apply to an identifiable product or group of products, the document must lay down one or more characteristics of the product, and compliance with the product characteristics must be mandatory.¹²

The TBT Agreement applies to technical regulations and standards focused on processes and production methods when they relate to the characteristics of products covered by the Agreement. However, it is unclear if the Agreement also covers processes and production methods that are not detectable in the final product, also known as non-product related processes and production methods. Parties raised this issue during the Uruguay Round of GATT negotiations, but it was not clarified in the final text.¹³

For a carbon passport, even if the information provided on a good is about non-product related processes and production methods, it could still fall within the scope of the TBT Agreement. In the *Australia — Tobacco Plain Packaging* case, the retail packaging of tobacco was considered to be part of the appearance of the product, constituting product

characteristics.¹⁴ Thus, schemes requiring marks on the product about carbon emitted during its production or setting qualification for low-carbon labels can apply to “an identifiable product or group of products” and lay down “one or more characteristics of the product.” Such measures would then fall within the scope of the TBT Agreement.¹⁵

In terms of the mandatory requirement, measures that condition market access upon the bearing of a label would qualify as mandatory. However, if producers retain the option of not using the label and the goods may still enter the market, the mandatory nature of the measure would be questionable. In *US –Tuna II*, the Appellate Body of the WTO emphasized the importance of reviewing the measure considering its characteristics and the circumstances of the dispute. There the Appellate Body found that the U.S. labeling scheme set out a single definition of a “dolphin-safe” tuna product.¹⁶ Although Mexican tuna products with labels not meeting that definition could still access the U.S. market, those products could not be marked as “dolphin-safe.” The “dolphin-safe” label was therefore considered mandatory.¹⁷

Similarly, if a carbon passport measure imposed by an importing country were to set a single set of conditions for using climate-friendly labels, it would be equivalent to establishing a climate-friendly standard in a mandatory manner. Even if products could enter a market in general, they would only be considered climate-friendly if the set conditions were fulfilled.

Processes and production methods and “like products”

Assuming a carbon passport label was considered a technical regulation within the scope of the TBT Agreement, the next question would involve the meaning of “like” products. The following criteria are traditionally used to determine “like” products: the properties, nature, and quality of the products; the end-uses of the products; consumers' tastes and habits with respect to the products; and tariff classification of the products. These four criteria for

determining likeness do not explicitly take into account the process and production methods of traded products.¹⁸

In *EC – Asbestos*, despite finding that the toxicity of chrysotile asbestos fibers differentiates¹⁹ the product from PCG fibers,²⁰ the Appellate Body was reluctant to conclude whether those differences alone would make cement-based products containing chrysotile and those containing PCG fibers “unlike” physically.²¹ Extending this reasoning to the climate change context, it is not clear whether two products could be considered “unlike” solely because their components carry different levels of embedded carbon.

One possible way around this issue, as Bacchus observed, citing the Appellate Body decisions in *EC-Asbestos* and in *Canada-Feed-in Tariff*, is to claim that the differences in carbon emissions of products make them “unlike” because local buyers deem them different, i.e., a matter of the third criterion of consumer preferences.²² Under this theory, two products, one with a carbon passport label and one without, would not be in a competitive relationship.²³ A carbon passport label might best protect itself from WTO challenges by focusing on a particular group of products and ensuring that the label is not the sole means of conveying messages to consumers. The UNFCCC, Paris Agreement, and ISO 14067 could be additional backdrops to justify consumer preferences and affect the competitive relationship between otherwise like products.²⁴

“No less favorable” treatment

Assuming “like” products, the next issue would be whether a label results in less favorable treatment. In examining whether there is “treatment no less favorable,”²⁵ adjudicators assess whether the measure in question modifies the conditions of competition in the relevant market to the detriment of imported products.

In *US-Certain Country of Origin Labeling (COOL)*, a series of U.S. instruments required producers to inform consumers of the country of origin of meat products through a label on the packaging. The label could fall into five different categories, each divided into three sub-categories. The measure established, among other things, that consumer information regarding muscle cuts should be in the format of “product of” one or more specific countries. The United States argued that the measure did not legally compel market participants to choose between processing either exclusively domestic or exclusively imported livestock. In the United States’ view, it was a private actor’s decision, not the measure itself, that benefited domestic products to the detriment of like imported products.²⁶

The Appellate Body analyzed five business scenarios involving segregation of livestock and meat of domestic and imported origin at different levels of intensity and compliance costs. It found that the measure created an incentive for U.S. producers to segregate livestock according to origin and, more specifically, to process exclusively U.S.-origin livestock.²⁷ Thus, the Body found that the measure modified the conditions of competition in the United States market to the detriment of imported livestock.²⁸

By analogy, the neutrality of a scheme that, for example, required all products to indicate their carbon footprints, might depend primarily on its enforcement mechanism. If the tracing, recognition, and verification process for imported products were so burdensome that retailers or producers would prefer to sell domestic products only, the scheme could be regarded as modifying competitive opportunities in the market.

Justifying labeling measures under flexibilities of WTO disciplines

If a carbon labeling measure were found to be inconsistent with one or more of the GATT 1994 obligations, it might still be justified under the Agreement’s Article XX exceptions.²⁹ Adjudicating a dispute in this regard would first entail a “necessity test” that weighs and

balances a series of factors, namely the importance of the objective, the contribution of the measure to that objective, and the trade restrictiveness of the measure. Even if found “necessary,” the measure must not be “applied in a manner that would constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.”³⁰

In terms of evaluating trade measures in relation to an environmental objective, WTO adjudicators have assessed measures in their regulatory context, very often as a component of a comprehensive policy. For example, adjudicators viewed the import ban on waste tires in *Brazil – Retreaded Tyres* together with Brazil’s collection and disposal scheme of waste tires, aimed at inducing sustainable behavior from domestic players.³¹ Adjudicators found the import ban made a material contribution to the achievement of Brazil’s legitimate objective of reducing the exposure to risks arising from the accumulation of waste tires.³²

Compellingly, in *Australia – Tobacco Plain Packaging*, the panel repeatedly emphasized the importance of viewing the plain-packaging measures in the context of Australia’s entire, multi-faceted tobacco control scheme.³³ For instance, the panel commented that the measures “operate to support and complement the effectiveness of these other measures, by avoiding regulatory gaps (in respect of advertising and promotion) and ensuring that other tobacco efforts aimed at raising awareness of the harmful effects of smoking (including [health warnings] and social media campaigns) are not undermined.”³⁴ It is in this context that the panel rejected alternatives proposed by the complainants. The panel viewed all presented alternatives as insufficient.³⁵

Therefore, if the public policy underlying carbon passports is to discourage highly carbon-intensive production processes or the consumption of products that lead to high carbon emissions, it is essential that participating importing countries impose such conditions not only on imports but also on domestic production. The policy should apply beyond small categories of products, also including substitutable products with similar carbon content.

Providing consumers with information might, in and of itself, be considered a legitimate regulatory objective, in that providing such information bears some relation to the objective of preventing deceptive practices. However, depending on the particular market situation, such an objective would not necessarily be considered an important one. In *U.S. – COOL*, for example, the adjudicators doubted whether there was any evidence showing that U.S. consumers wanted information about the country in which the birth, raising, and slaughter of livestock occurred. Most U.S. consumers were not willing to bear all the costs of such labeling, leading to a conclusion that non-fulfillment of the objective would not be particularly grave.³⁶

These considerations would be particularly relevant to product carbon-intensity measures. In scenarios where buyers engage in high numbers with a voluntary carbon passport scheme, a State would likely have greater justification for the introduction of mandatory measures to provide high-quality, consistent, and precise information to buyers. Should a dispute occur, this data could help prove the importance of providing such information.

The requirements of tracing information and the level of accuracy required in reporting could be subject to debate if costs are excessive. For example, in *US – COOL*, the Appellate Body found that the level of information conveyed on the labels to consumers was far less detailed and accurate than the information that upstream livestock producers and processors were required to track and transmit. The adjudicators concluded that the manner in which the *COOL* measures sought to provide information to consumers on origin was arbitrary, and the disproportionate burden imposed on upstream producers and processors was unjustifiable.³⁷

In designing carbon passport labeling requirements, policy makers should address the extent to which carbon emissions should be traced throughout the life cycle of products.

Excessively detailed information might be meaningless if it were not effective in communicating information to buyers.

Technology might play a role in addressing this policy dilemma. In *US-COOL*, complainants were notably proposing to use a trace-back system where a retailer would be able to trace a piece of meat back to the original animal, providing the precision of location for each processing step. For the complainants, such a system would allow for an equal distribution of any extra cost among all market participants. With the development of new technology, it may be possible to design cost-efficient, trustable tracing and verification systems for carbon passport measures.

Finally, in terms of related multilateral actions, in *US – Shrimp*, the United States ultimately prevailed after correcting its arbitrary actions in implementing the original Appellate Body ruling by pursuing multilateral actions.³⁸ The panel in *Australia — Tobacco Plain Packaging* referred to the emerging multilateral public health policies as reflected in the World Health Organization’s Framework Convention on Tobacco Control and its associated “relevant” guidelines, and found the packaging measures were reasonable.³⁹ A trade measure imposing a carbon-related standard as part of a carbon passport scheme could potentially gain some backing through the existence of the Paris Agreement, reflecting a multilateral public policy implemented through collaboration.

Carbon Passports as a Possible Response to Embedded Carbon and the Trading System

Energy-intensive industries are comparatively easy to identify. With the announced departure of the United States from the Paris Agreement, the urgency of addressing industrial emissions and embedded carbon in products becomes even more pressing. According to Odell, “Few major exporting firms in highly polluting countries are prioritizing lobbying in their capitals for more effective national mitigation. New barriers in their major foreign markets that hit, or

even threaten to hit, their exports will give these exporters, including farmers, a powerful incentive to join the climate change campaign calling for more effective market-oriented abatement policies.”⁴⁰

However, to encourage climate action, the imposition of trade disciplines might best go hand in hand with a market opening for products that reduce their embedded carbon. In this regard, an intergovernmental or inter-industry agreement (on marketing opening or on passports), rather than potentially contentious unilateral measures, may be most effective. Sectoral agreements for market opening, or for passports, could be the initial foundational basis for addressing embedded carbon in products.

Governments and stakeholders may choose to focus on a select basket of heavily traded, energy- and carbon-intensive sectors and products, and assign a desirable carbon emissions target for each selected sector and specific products. Selection may also follow a review of greenhouse gas emissions reduction potential, marginal abatement costs, and availability of technology and finance, granting priority to sectors for which deployment of best available technologies and other methods would lead to maximum energy savings and reduction of greenhouse gas emissions.

Initially, major producing and exporting countries and/or coalitions of governments and producers could agree to carbon emission-based targets for selected sectors and products. Firms that met the target threshold for embedded emissions or exceeded it by further lowering emissions would be eligible for a carbon passport for their products, allowing them duty-free access to markets applying the scheme. Carbon or other internal taxes that may have been charged otherwise might also be waived. Products that were not able to produce a carbon passport at the border would face price or non-price-based measures such as import bans, higher import duties, or higher carbon taxes. The scheme might be organized to operate on a voluntary basis over a trial period, eventually leading to mandatory measures.

A core carbon passport requirement could be the use of the August 2018 ISO 14067 standard as the basis for the calculation of embedded carbon. Such a condition could strengthen the passport's compatibility with WTO law and frame it as a TBT requirement. According to the Nobel Peace Prize laureate Klaus Radunsky, "[t]he standard establishes a recognised reference frame for the Carbon Footprint of a Product, and it has been considered as 'a very important tool for obtaining a good indication of areas in which greenhouse gases can be reduced.'"⁴¹ ISO 14067 also lays down various boundaries that define the stages that need to be studied in a life-cycle analysis.⁴²

A multilateral approach to determining the threshold emission levels for a product to be eligible for a carbon passport could involve an independent technical and scientific committee. It might also involve a technology and financial assistance package, channeled through or recognized by the UN Framework Convention on Climate Change Technology Mechanism and the Green Climate Fund, particularly for developing countries, or through the involvement of multilateral banks and development institutions.⁴³

A scheme achieved through collaboration between governments and industry and anchored in the ISO 14067 standard would also enable cost reductions for producers who would only need to comply with carbon passport information requirements, as opposed to complying with numerous national and private certification product carbon footprint schemes. Such a scheme would also be consistent with the approach taken by the TBT Agreement, which encourages members to harmonize national technical standards with international standards to reduce trade costs. Further reflection may still be needed to assert the relevance of such specific international standard under the TBT Agreement⁴⁴, and to determine what should happen if a responding country has not adopted the ISO standard.

Key Design Elements of a Sectoral Agreement on Carbon Passports

Critical considerations and elements of sectoral initiatives on carbon passports may include:

- *Eventual incorporation as mandatory regulation.* To be truly effective, a scheme should require eventual mandatory use by those governments signing up for the schemes (ideally all UNFCCC members).
- *Flexibility of process with emissions reduction as the end-goal.* Eligibility requirements should follow a flexible approach to emission reductions in order to account for the diversity of circumstances in producing countries. Requirements should only prescribe the use of the most appropriate and most cost-effective technologies and best practices for plants and facilities that would result in an increase in energy efficiency or enable the attainment of the desired emissions level during the production process. The formulation of any processes and production methods that involve the use of specific technologies and methods to the exclusion of others could risk favoring technologies that may be unavailable, unsuitable, or prohibitively expensive. Specifying emission or performance effects rather than the use of specific methods or technologies would also help avoid capture by vested interests. This flexibility approach will enable participation in global emissions reduction consistent with the international law *common but differentiated responsibilities principle* (CBDR), stressing the continuum of diverse national circumstances.
- *A de minimis threshold.* A *de minimis* threshold for greenhouse gas emissions could be set, which all producers would need to meet to maintain their market access.

- *Periodic review.* A periodic review should also be considered based on technological progress and objective evaluation of costs and techno-economic feasibility.
- *Establishment of a monitoring and reporting mechanism* – to ensure credibility, verify compliance with the standards, and to monitor overall use and carbon benefits of the passports over time.

Based on the initial results obtained with high-energy and carbon-heavy sectors and products, and as carbon footprint accounting practices become more sophisticated and reliable, carbon passport schemes might eventually be established for other products along supply chains, including downstream products such as consumer appliances or vehicles. Schemes could also potentially evolve to integrate operational and end-of-life analyses, as well as circular economy approaches.

Market access for products that carry carbon passports based on internationally accepted and sound accounting methodologies could thus represent an excellent opportunity for trade policy to act in a targeted and effective way in support of climate change efforts. For this to be operationalized, policy makers may want to agree to greater preferential access conditions for goods carrying carbon passports, depending on the basis of carbon-relevant characteristics.

Concluding Thoughts

In the context of open international markets, emissions growth is driven by global demand for goods that have differential embodied carbon. As such, climate change action organized around national policies and measures to reduce a country's territorial emissions is insufficient. It is thus essential to tackle the issue of embedded carbon through the provision

of reliable, trustworthy information to global markets and policymakers, and to devise modalities that enable goods to be treated differently on the basis of their climate-friendliness. The notion of goods traveling with a carbon passport, containing their full carbon profile, could be implemented gradually, through voluntary and sectoral initiatives progressively covering the goods driving higher emissions along their international value chains. Passports would provide information to affect the purchasing choices of intermediate and final goods by firms, manufacturers, and ultimately consumers. Such an approach, anchored in multilateral trade law, would result in technological innovation and guide production and consumption towards a lower carbon future. We have argued above that a further step of negotiating differentiated market access conditions is also plausible if schemes are appropriately designed in terms consistent with WTO law. Furthermore, in light of the apparent inevitability in the next few years of accelerated urgency to more rapidly and effectively manage emissions in the global economy, enabling changes in WTO law may need to be explored and eventually introduced through well-informed negotiations.

Notes

¹ The matter of this paper was the subject of research work at the ICTSD for several years. The author wishes to thank his colleagues for valuable input and support, in particular Ingrid Sidenvall Jegou for the initiative to pick up this theme again, and Mahesh Sugathan for essential contributions.

² Ricardo Meléndez-Ortiz, “Trade and Equity in a World Where Goods Carry Carbon Passports,” *Trade – What If? Consumers, Ethics, and Environment* (Geneva, Switzerland: International Trade Centre, 2008), 82-83.

³ “Global Carbon Atlas,” Global Carbon Project, released 2017,
<http://www.globalcarbonatlas.org/>.

⁴ Steven J. Davis and Ken Caldeira, "Consumption-Based Accounting of CO₂ Emissions," *Proceedings of the National Academy of Sciences* 107, no. 12 (March 2010): 5688,
<https://doi.org/10.1073/pnas.0906974107>.

⁵ International Organization for Standardization, *ISO 14067:2018, Greenhouse Gases – Carbon Footprint of Products – Requirements and Guidelines for Quantification*, (Geneva: ISO, 2018), <https://www.iso.org/standard/71206.html>.

⁶ Richard Baron, “The Role of Public Procurement in Low-Carbon Innovation,” Organisation for Economic Co-operation and Development, (2016):17-18,
<https://www.oecd.org/sd-roundtable/papersandpublications/The%20Role%20of%20Public%20Procurement%20in%20Low-carbon%20Innovation.pdf>.

⁷ Paul Brenton et al., *Carbon Footprints and Food Systems: Do Current Accounting Methodologies Disadvantage Developing Countries?*, (World Bank, 2010): 64-66,
<https://openknowledge.worldbank.org/handle/10986/2506>.

⁸ “Carbon leakage refers to the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints. This could lead to an increase in their total emissions” (“Carbon leakage,” European Commission, accessed January 12, 2019,
https://ec.europa.eu/clima/policies/ets/allowances/leakage_en).

⁹ BCA refers to a trade measure in the form of a tax adjustment at the border, levying a duty on the carbon content of imports or providing a rebate to exporters, in order to level the playing field between producers in a jurisdiction bearing a carbon pricing measure and their competitors abroad under lesser or un-existent similar carbon measures. Generally speaking,

a literature review reveals that even though controversial and untested, BCAs, if carefully designed, may be effective and WTO compatible. A comprehensive discussion on controversy and feasibility is found in Aaron Cosbey et al, “Developing Guidance for Implementing Border Carbon Adjustments: Lessons, Cautions, and Research Needs from the Literature,” *Review of Environmental Economics and Policy* 13, no. 1 (Winter 2019): 3-22, <https://doi.org/10.1093/reep/rey020>. Since 2015, at least four bills have been presented in the U.S. for legislation on climate that include introduction of BCAs. For their review see Adele C. Morris, *Making Border Carbon Adjustments Work in Law and Practice*, (Washington, DC: Urban Institute and Brookings Institution, 2018).

¹⁰ Ricardo Meléndez-Ortiz and Richard Samans, *Strengthening the Global Trade and Investment System for the 21st Century*, (Geneva: International Centre for Trade and Sustainable Development and World Economic Forum, 2016):19, <http://e15initiative.org/publications/executive-summary-synthesis-report-full-report/>. For a detailed outline of an affective WTO complaint design of BCAs, see: Brian Flannery et al, *Framework for a U.S. Upstream Gas Tax with WTO-Compliant Border Adjustments*, (Washington, DC: Georgetown University Law Center and Resources for the Future, 2018), <https://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=3064&context=facpub>.

¹¹ I’m particularly grateful to my ICTSD colleagues Yaxuan Chen for providing me with comprehensive clear legal reasoning for this section, and James Bacchus for his expert oversight and review.

¹² World Trade Organization, *Australia – Certain Measures Concerning Trademarks, Geographical Indications and Other Plain Packaging Requirements Applicable to Tobacco Products and Packaging, Reports of the Panels*, (Geneva: World Trade Organization, 2018), para. 7.110, referring to *European Communities – Trade Description of Sardines, Report of*

the Appellate Body, para. 176,

https://www.wto.org/english/tratop_e/dispu_e/435_441_458_467r_e.pdf.

¹³ World Trade Organization, *Negotiating History of the Coverage of the Agreement on Technical Barriers to Trade with Regard to Labelling Requirements, Voluntary Standards, and Processes and Production Methods Unrelated to Product Characteristics*, (Geneva: World Trade Organization, 1995).

¹⁴ World Trade Organization, *Australia – Tobacco Products and Packaging*, para. 7.142-7.143.

¹⁵ In the TBT, every *technical regulation* pertaining to products is considered under its scope. Its Annex 1.1. defines *technical regulation* as a documentation of the product's characteristics or their related process or production methods. Furthermore, a regulation that addresses a product's characteristics, such as a scheme defining a carbon passport, is then a technical regulation under the TBT. See "Agreement on Technical Barriers to Trade - Marrakesh Agreement Establishing the World Trade Organization," registered on June 1, 1995, *United Nations Treaty Series*, no. 31874, <https://treaties.un.org/doc/Publication/UNTS/Volume%201868/v1868.pdf>.

¹⁶World Trade Organization, *United States – Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products, AB-2012-2, Report of the Appellate Body*, (Geneva: World Trade Organization, 2012): para. 190-199.

¹⁷ World Trade Organization, *United States - Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products - Report of the Panel*, (Geneva: World Trade Organization, 2012): *para. 6.6 – 6.17*. See also analysis in Maria Wilke, "Tuna Labeling and the WTO: How Safe is 'Dolphin-Safe'?" *ICTSD BioRes* Volume 6, Issue 2, (July 2012): 16-19, <https://www.ictsd.org/sites/default/files/review/bioresreview/biores6-2.pdf>.

¹⁸ James Bacchus, *The Case for a WTO Climate Waiver*, (Waterloo, ON: Center for International Governance Innovation, 2017), https://www.cigionline.org/sites/default/files/documents/NEWEST%20Climate%20Waiver%20-%20Bacchus_0.pdf; citing the WTO rulings in World Trade Organization, *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products, Report of the Appellate Body* and *Canada – Measures Relating to the Feed-In Tariff Program, Reports of the Appellate Body* (Geneva: World Trade Organization, 2000).

¹⁹ World Trade Organization, *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products, Report of the Appellate Body*, para. 114.

²⁰ PCG fibres collectively refer to polyvinyl alcohol (PVA) fibres or cellulose and glass fibres: World Trade Organization, *European Communities*, para. 84.

²¹ World Trade Organization, *European Communities*, paras. 142-143.

²² Bacchus, *The Case for a WTO Climate Waiver*, 4.

²³ WTO, *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products, Report of the Appellate Body*, para. 142-143.

²⁴ A question that arises is whether even in the absence of consumer preferences could a government's obligations to climate action under the Paris Agreement constitute a rationale as long as the measure was based on a standard like ISO 14067 and did not discriminate between domestic and imported products.

²⁵ *Agreement on Technical Barriers to Trade*, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Article 2.2, 1868 U.N.T.S. 120, <https://treaties.un.org/doc/Publication/UNTS/Volume%201868/v1868.pdf>.

²⁶ World Trade Organization, *United States – Certain Country of Origin Labelling (COOL) requirements, Reports of the Appellate Body*, (Geneva: World Trade Organization, 2014), paras. 281, 287, https://www.wto.org/english/tratop_e/dispu_e/384_386abr_e.pdf.

²⁷ World Trade Organization, *US – COOL*, para. 289.

²⁸ World Trade Organization, *US – COOL*, para. 292.

²⁹ Bacchus, *The Case for a WTO Climate Waiver*, 15.

³⁰ WTO, *European Communities – Measures Prohibiting the Importation and Marketing of Seal Products, Reports of the Appellate Body*, (Geneva: World Trade Organization, 2014), paras. 5.122-5.124, https://www.wto.org/english/tratop_e/dispu_e/400_401abr_e.pdf.

³¹ World Trade Organization, *Brazil - Measures Affecting Imports of Retreaded Tyres, Report of the Appellate Body*, (Geneva: World Trade Organization, 2007), para. 154, [https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006.aspx?Query=\(@Symbol=%20wt/ds332/ab/r*%20not%20rw*\)&Language=ENGLISH&Context=FomerScriptedSearch&languageUIChanged=true#](https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006.aspx?Query=(@Symbol=%20wt/ds332/ab/r*%20not%20rw*)&Language=ENGLISH&Context=FomerScriptedSearch&languageUIChanged=true#).

³² World Trade Organization, *Brazil - Measures Affecting Imports of Retreaded Tyres*, para. 155.

³³ International Centre for Trade and Sustainable Development, “WTO Panel Upholds Australia Plain Packaging Policy for Tobacco Products,” *Bridges Weekly* 22, no. 24 (July 5, 2018), <https://www.ictsd.org/bridges-news/bridges/news/wto-panel-upholds-australia-plain-packaging-policy-for-tobacco-products>.

³⁴ World Trade Organization, *Australia – Tobacco Products and Packaging*, paras. 7.1041-7.1043.

³⁵ World Trade Organization, *Australia – Tobacco Products and Packaging*, paras. 7.1724-7.1732.

³⁶ World Trade Organization, *US-COOL*, para. 478.

³⁷ World Trade Organization, *US-COOL*, paras. 346-347.

³⁸ Bacchus, *The Case for a WTO Climate Waiver*, 16.

³⁹ International Centre for Trade and Sustainable Development, “WTO Panel.”

⁴⁰ John S. Odell, *Our Alarming Crisis Demands Border Adjustments Now*, (Geneva: International Centre for Trade and Sustainable Development, 2018): 2.

⁴¹ Iciar Gallo, "What Is ISO 14067:2013 and Why Is It Useful for Carbon Footprint?" ISO 14001 Blog (blog), 14001 Academy, May 30, 2017, <https://advisera.com/14001academy/blog/2017/05/30/what-is-iso-14067-2013-and-why-is-it-useful-for-carbon-footprint/>.

⁴² Iciar Gallo, "What Is ISO 14067:2013 and Why Is It Useful for Carbon Footprint?"

⁴³ Technology transfer, we now know, is a crucial element. Sato observes that "Weber et al. ["The Contribution of Chinese Exports to Climate Change," 3577] and Carbon Trust ["International Carbon Flows"] identify the inefficient and coal-dominated electricity production in China as the main source of embodied carbon in consumption around the world. These authors suggest that policies promoting technology transfer in these carbon-intensive industries may be more direct and effective than efforts to reduce trade (e.g. with a border carbon tax), partly because of the large indirect role of the same industries in supplying each other, and also because of the potential magnitude of problems involved in agreeing a trade treaty."