

LEVERAGING TRADE AGREEMENTS TO PROMOTE THE IMPLEMENTATION OF MOST COMMON NDCs UNDER THE PARIS AGREEMENT

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To: Trade and Environment Division of the WTO

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List of Abbreviations

Advanced Cell Chemistry (ACC)
Agreement of Government Procurement (GPA)
Agreement on Government Procurement (GPA)
Agreement on Technical Barriers to Trade (TBT)
Asia-Pacific Economic Cooperation (APEC)
Bilateral investment treaties (BITs)
Centre for Trade and Economic Integration (CTEI)
Conference on Trade and Development (UNCTAD)
Current non-state market-driven (NSMD)
Environmental Goods Agreement (EGA)
Faster Adoption and Manufacturing of Hybrid and EV scheme of 2015 (FAME)
Forest Stewardship Council (FSC)
General Agreement on Tariffs and Trade (GATT)
Indirect land use change (ILUC)
Intergovernmental Panel on Climate Change (IPCC)
Islands developing states (SIDS)
Land Use, Land-Use Change and Forestry (LULUCF)
Land-use, Land-use change and forestry (LULUCF)
Least developed countries (LDC)
Low Carbon Emission Agriculture Program (ABC)
Most-favored nation (MFN)
Nationally Determined Contributions (NDCs)
Nations Framework Convention on Climate Change (UNFCCC)
Process or production method (PPM)
Production Linked Incentive Scheme (PLI)
Regional Trade Agreements (RTAs)
Renewable Energy Directive (RED II)
Subsidies and Countervailing Measures (SCM)
United Nations Intergovernmental Panel on Climate Change (IPCC)
Value added tax (VAT)
World Trade Organization (WTO)

Executive Summary

This report identifies synergies between trade agreements and Nationally Determined Contributions (NDCs) to the Paris Agreement. More specifically, it analyzes how provisions in existing trade agreements can be leveraged to help countries achieve the goals they have submitted under the Paris Agreement.

Specifically, this report provides deeper analysis of the most common categories of NDCs themselves. Building on the synthesis report of the UNFCCC Secretariat and the 2016 Trade Lab report, *UNFCCC National Determined Contributions: Climate Change and Trade*, this report identifies five critical categories of NDC goals: energy, building, waste, transport and land use, land-use change and forestry (LULUCF). For each of these areas, this report identifies a trade-related measure that could be adopted towards achieving the NDC. The measures examined in this analysis are: reducing or removing applied tariffs on wind turbine component parts for the energy category; VAT reduction on Energy Saving Insulated Windows (ESIW) for the buildings category; government procurement of plastic pollution capture devices for the waste category; transfer of electric highway technologies for the transport category; and soybean due diligence and certification schemes for what concerns the LULUCF category. Relevant supportive mechanisms are identified, but their detailed analysis is beyond the scope of this work.

For each measure, this report examines WTO compatibility that identifies any potential conflicts. For the measures examined, this report finds that while the WTO rules delineate the policy space countries have to adopt various measures to implement their NDCs, countries generally have the opportunity to do so in a WTO-consistent manner. Nevertheless, there are a number of different areas in which the link between NDCs and the WTO covered agreements can be strengthened. Accordingly, this report identifies various areas where improvements can be made, with a focus on (i) the implementation of Article 66.2 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS); (ii) the ratification of the plurilateral Agreement on Government Procurement (GPA); and (iii) the transformation of the NDCs into a law at the domestic level. It then addresses the possibility of a climate change waiver of WTO obligations. While some of these measures are currently controversial, they may prove necessary in order to combat climate change.

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1 Introduction

Climate change is one of humanity’s greatest challenges, threatening life as we know it on Earth. The term climate change refers not only to the global rise of temperatures, also known as global warming, but also to a higher frequency of extreme weather events such as drought, heat waves, heavy rains, and violent storms. Higher atmospheric concentrations of greenhouse gases, most notably CO₂, cause climate change and increase global temperatures. According to the sixth assessment report of the United Nations Intergovernmental Panel on Climate Change (IPCC), published in 2021,¹ the unequivocal growth in CO₂ in the atmosphere since 1750 is due to direct emissions from human activities, in particular the combustion of fossil fuels and land-use change.

¹ “Technical Summary of Climate Change 2021. The Physical Science Basis.” (Intergovernmental Panel on Climate Change, n.d.), TS-46, https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report_smaller.pdf.

On 12 December 2015, the 196 Parties to the United Nations Framework Convention on Climate Change (UNFCCC) adopted the Paris Agreement. It established the objective to hold the global temperature increase to well below 2 C° above pre-industrial levels with efforts to limit the increase to 1.5 C° above pre-industrial levels. The overall target of the Paris Agreement constitutes a significant development in the fight against climate change. The Glasgow Climate Pact² adopted at the Conference of the Parties of the Paris Agreement in 2021 reaffirmed the commitment to hold the increase in the global average temperature to well below 2°C.

The Paris Agreement builds upon the objective set in 1992 by Article 2 of the UNFCCC which seeks the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”. Furthermore, the Paris Agreement is more ambitious than the Kyoto Protocol of 1997, which incorporated greenhouse gas reduction targets only for 36 industrialized countries and the European Union. However, emerging economies whose emissions were bound to increase most significantly were not subject to quantified obligations under the Protocol, which undermined its overall effectiveness.

To implement the objectives set out in the Paris Agreement, State Parties agreed to adopt Nationally Determined Contributions (NDCs) and to pursue domestic mitigation measures. States remain free to choose their levels of reduction subject to two requirements, namely updating their NDCs every five years and increased ambition beyond the Party’s existing NDC. The Secretariat of the Paris Agreement is responsible to record all NDCs submitted in a public registry. At the time of completion of this report, 194 Parties of the Paris Agreement have submitted their first NDCs while 13 Parties (Argentina, Bhutan, Gambia, Grenada, Marshall Islands, Nepal, Oman, Papua New Guinea, Samoa, South Sudan, Suriname, Tonga, and the United Arab Emirates) have submitted also their second NDCs. Regarding the content of NDCs the Paris Agreement does not provide general guidance as it only states in article 4.8 that “Parties shall provide the information necessary for clarity, transparency and understanding”. Additionally, Article 4.9 of the Paris Agreement states explicitly that the submission of every NDC shall be made in accordance with decision 1/CP.21³ and any relevant decision of the Conference of the Parties. However, it remains up to the Member to include as much information as it considers appropriate.

The Paris Agreement does not make any specific mention of trade. Nevertheless⁴, 45% of the climate contributions in the run-up to the 2015 United Nations Climate Change Conference (COP21) entailed a direct reference to trade or trade-related elements. Furthermore, parties to the Paris Agreement have discussed several trade-

² Conference of the Parties serving as the meeting of the Parties to the Paris Agreement, “Glasgow Climate Pact.,” November 13, 2021, FCCC/PA/CMA/2021/L.16 (Advance version), https://unfccc.int/sites/default/files/resource/cma2021_L16_adv.pdf.

³ Decision 1/CP.21. Report of the Conference of the Parties on Its Twenty-First Session, Held in Paris from 30 November to 11 December 2015. Addendum. Part Two: Action Taken by the Conference of the Parties at Its Twenty-First Session.,” January 29, 2016, <https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf#page=2>.

⁴ Clara Brandi, “Trade Elements in Countries’ Climate Contributions under the Paris Agreement” (International Centre for Trade and Sustainable Development, 2017), 12, https://ictsd.iisd.org/sites/default/files/research/trade_elements_in_countries_climate_contributions.pdf.

related issues in technical bodies⁵ under the auspices of the UNFCCC. These include the Improved Forum on Response Measures and the Katowice Committee of Experts (KCI); the Nairobi Work Programme on Adaptation; and the Koronivia Joint Work on Agriculture.

2 Mapping the most common forms of NDCs under the Paris Agreement

2.1 Background: narrative on the evolution of the trade-environment nexus

The relationship between trade and the environment is a turbulent one.⁶ On one hand, the movement and transport of goods can encourage the spread of invasive species and contribute to air and water pollution through the release of fuel or waste.⁷ Moreover, the rules set out in the WTO and Regional Trade Agreements (RTAs) delineate a country's policy space, thereby limiting the trade-related environmental measures that countries can adopt.

On the other hand, free trade also facilitates the dissemination of good environmental practices and the transfer of cleaner technology from countries with high environmental standards to their trade partners. In addition, removing tariffs and trade restrictive measures gives companies greater access to more competitive suppliers. This makes capital-intensive, cutting-edge technology more affordable. Increased competition gives consumers more choice and reduces the costs of green products like solar panels and electric cars.

Environmental norms are increasingly found in trade agreements. At the WTO level, there is a reference to sustainable development in the Preamble of the Marrakesh Agreement that expressly declares that international trade must be carried out "to protect and preserve the environment". Moreover, certain types of violations of the GATT are justified under GATT Article XX if, *inter alia*, a member can demonstrate that the measure was necessary to protect human, animal, or plant life or health, or to preserve exhaustible natural resources. Similarly, Article XIV of the GATS set out specific grounds for the justification of measures, which are otherwise inconsistent with the GATS including the protection of human, animal or plant life or health. However, WTO rules require a strong causal link between the measure and the environmental measure in question, making a successful GATT Article XX defence challenging.

Furthermore, most RTAs include exceptions provisions with similar or identical language. A 2016 WTO study finds that 262 out of the total 270 RTAs notified to the WTO between 1956 and May 2016 included an environmental exception like the one

⁵ WTO Document, "Trade and Climate Change. Information Brief N° 1 (Mapping Paper: Trade Policies Adopted to Address Climate Change)," 2, accessed November 14, 2021, https://www.wto.org/english/news_e/news21_e/clim_03nov21-1_e.pdf.

⁶ Daniel Bodansky and Jessica C Lawrece, "Trade And Environment," in *The Oxford Handbook of International Trade Law*, ed. D. L. Bethlehem et al. (Oxford ; New York: Oxford University Press, 2009), 506.

⁷ Bodansky and Lawrece, 510.

contained in GATT Article XX.⁸ Moreover, since 2005, 70.4% of all trade agreements concluded include at least ten different types of environmental norms.⁹ For instance, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), concluded in March 2018 includes a chapter of 26 pages devoted on the environment.¹⁰

2.2 Methodology and Mapping Scope

This Chapter maps the most common forms of NDCs under the Paris Agreement. The research takes into account the findings of two key studies: the UNFCCC synthesis report, and a 2016 TradeLab Project on NDCs and trade. The synthesis report by the Secretariat of the UNFCCC was published on 17 September 2021 in preparation for the COP26 in Glasgow.¹¹ The synthesis report draws on the 164 latest available NDCs, representing all 191 Parties to the Paris Agreement, including the 86 new or updated NDCs recorded in the interim NDC registry as of 30 July 2021. As set out in Figure 1 below, the report identifies areas of domestic mitigation measures and their frequency percentage, including energy supply (89%), transport (80%), buildings (72%), industry (39%), agriculture (67%), Land Use, Land-Use Change and Forestry (LULUCF) (75%), waste (68%) and cross-cutting/other (76%).

The other study this report builds on is a 2016 TradeLab Project, entitled “UNFCC Nationally Determined Contributions: Climate Change and Trade”¹² mandated by the United Nations Conference on Trade and Development (UNCTAD). This report identified the trade-related response measures included in NDCs and their designs. The categories identified by the previous TradeLab Project were measures related to the energy sector, green industrial policies, green government procurement, financial and direct trade measures, and international cooperation. However, the relevance of these categories has evolved as State Parties have updated their NDCs.

⁸ José-Antonio Monteiro, “Typology of Environment-Related Provisions in Regional Trade Agreements,” WTO Working Paper (World Trade Organization, 2016), 4, https://www.wto.org/english/res_e/reser_e/ersd201613_e.pdf.

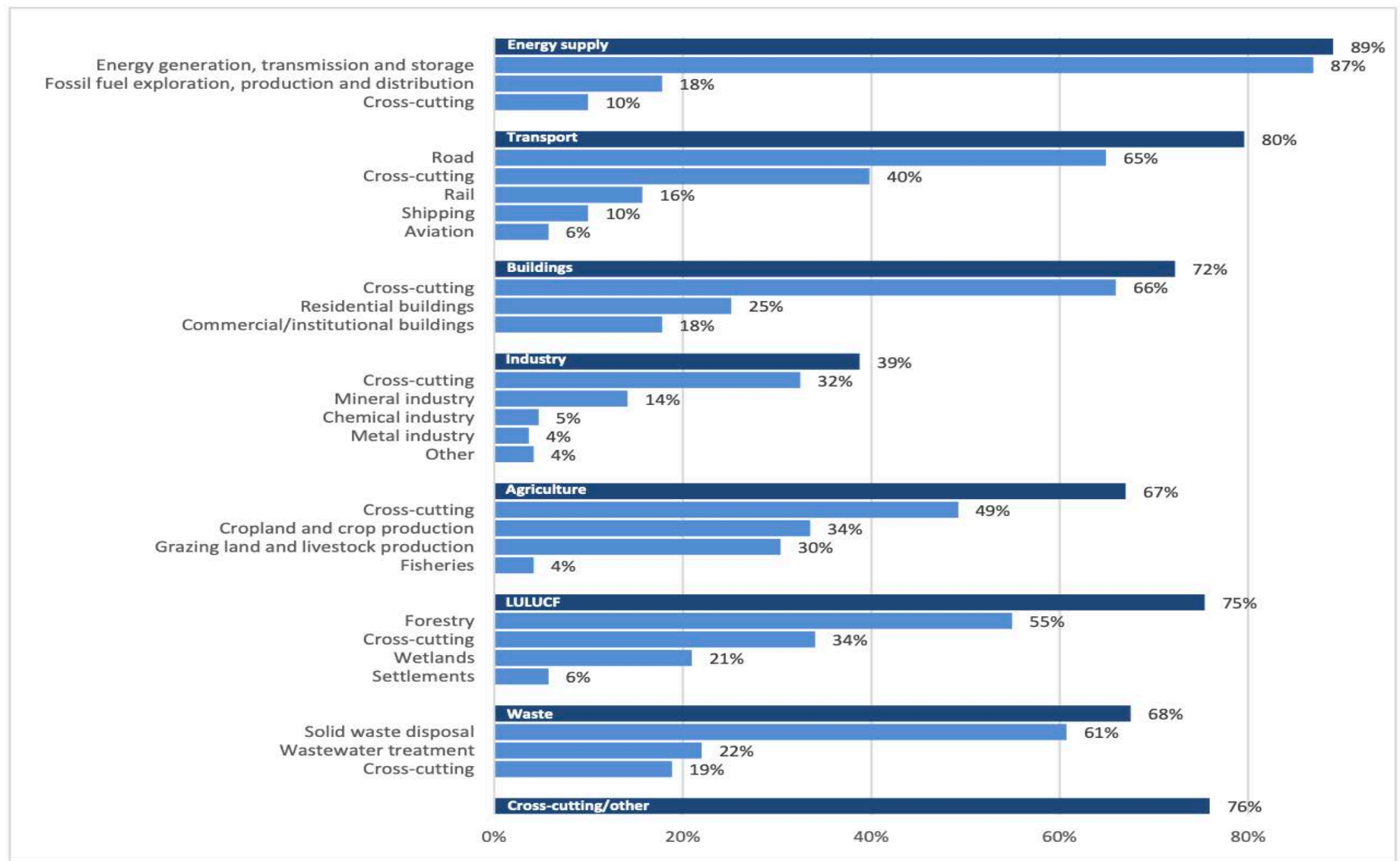
⁹ Jean Frédéric Morin, Joost Pauwelyn, and James Hollway, “The Trade Regime as a Complex Adaptive System: Exploration and Exploitation of Environmental Norms in Trade Agreements,” *Journal of International Economic Law* 20, no. 2 (June 2017): 383, <https://doi.org/10.1093/jiel/jgx013>.

¹⁰ Dominique Blümer et al., “Environmental Provisions in Trade Agreements: Defending Regulatory Space or Pursuing Offensive Interests?,” *Environmental Politics* 29, no. 5 (July 28, 2020): 866–89.

¹¹ “Nationally Determined Contributions under the Paris Agreement. Synthesis Report by the Secretariat.” (UNFCCC Secretariat, September 17, 2021), https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf.

¹² Rana Elkahwagy, Vandana Gyanchandani, and Dario Piselli, “UNFCC Nationally Determined Contributions: Climate Change and Trade.,” *CTEI Working Papers*, n.d., 64.

Figure 1: Share of Parties referring to specific priority areas and sub-areas for domestic mitigation measures in NDCs¹³



¹³ Source: Figure 12 of the Synthesis Report on the Nationally Determined Contributions under the Paris Agreement elaborated by the Secretariat of the UNFCCC.

2.3 Methodology and Mapping Format

The methodology used to identify the most common forms of NDCs¹⁴ follows a two-tier test. First, the category must be included in the Synthesis report of the UNFCCC, which has reviewed the measures contained in all the NDCs submitted by the State Parties to the Paris Agreement. Second, the category in question must have a trade impact because the measures to be proposed will require some relation or significance to global trade.

For each of the NDC categories, this report will examine trade-related measures specified in NDCs of 10 sample countries: China, the United States of America, the European Union, India, the United Kingdom, Brazil, New Zealand, South Africa, Malawi, and Mauritius. The rationale guiding the sample selection is to not only consider developed and developing countries, but also least developed countries (LDCs) (like Malawi) and small islands developing states (SIDS) (like Mauritius) directly affected by the sea level rise caused by climate change. Furthermore, the sample balances regional representation by including at least one country from each continent. The sample selection also considered the country's economic importance in global trade and their level of greenhouse gas emissions, in 2020, the European Union, the United States and China accounted for 45% of global imports and exports of goods.¹⁵ Finally, the sample takes into account countries' level of ambition to comply with the Paris Agreement. According to Climate Action Tracker,¹⁶ certain countries' NDCs include commitments qualified as almost sufficient (e.g., the United Kingdom) to reach the Paris Agreement's goal, while others (e.g., India and New Zealand) are considered highly insufficient.

2.4 Identified categories

Based on the methodology set out above, the most common NDC categories with relevance to international trade that this report will focus on are outlined below:

- **The energy sector.** Renewable energy generation is the most frequent mitigation option included in NDCs. According to the UNFCCC Synthesis Report, 89% of total NDCs include domestic mitigation measures in this area. For example, in the NDC of China, the use of renewable energy is reported as one measure to optimize the energy mix and reduce the consumption of fossil fuels energy.¹⁷ Similarly, the NDC of India lists wind energy, solar, and

¹⁴ Due to the limited number of Parties that have submitted their second NDC, this study includes the latest version available of the first generation of NDCs. Moreover, in some cases the submission has been delivered in one of the six official languages of the United Nations (English, Spanish, French, Arab, Chinese, and Russian). For linguistic reasons and with the goal of maintaining an accurate vision of the commitments made, this report will only analyse the English translation provided by each country.

¹⁵ Eurostat, "EU and Main World Traders," Statistics Explained, October 2021, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_and_main_world_traders.

¹⁶ <https://climateactiontracker.org/countries/>

¹⁷ "China's Achievements, New Goals and New Measures for Nationally Determined Contributions," NDC Registry, October 28, 2021, 8–9, <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China%E2%80%99s%20Achievements,%20New%20Goals%20and%20New%20Measures%20for%20Nationally%20Determined%20Contributions.pdf>.

biomass technologies as the three renewable energy sources the government wants to further implement¹⁸ to meet the objectives of the Paris Agreement. There is a clear link between renewable energy generation and trade. Between 2008 and 2012, 41 trade remedies including anti-dumping and countervailing duties were imposed by WTO Members on renewable energy products, affecting imports worth almost USD 32 billion.¹⁹ Furthermore, only 33 WTO Members²⁰ provide duty-free entry for solar photovoltaic components. Moreover, fossil fuel energy subsidies might soon be disciplined under trade agreements as well.²¹ Specifically, this section of the report will analyse how trade can promote the use of wind energy. It is one of the most promising forms of renewable energy generation because it is already cost-competitive relative to fossil fuel generation in some jurisdictions.²²

- **Building.** According to the UNFCCC Synthesis Report, 72% of NDCs refer to measures related to building. Some Parties' NDCs state the intention to require newly constructed buildings to be near net-zero energy.²³ For example, the NDC of the United Kingdom²⁴ or of New Zealand²⁵ include this objective. There is a nexus between improving building construction to be near net-energy and trade. Between 2009 and 2018, 1184 entries related to the energy sector were added to the WTO Environmental Database.²⁶ The number of notifications submitted by WTO Members demonstrates their interest in improving energy efficiency to implement their NDC obligations. Moreover, the Building category is interconnected with the energy sector as energy efficiency in buildings is as important as producing energies from renewable

¹⁸ "India NDC," NDC Registry, October 2, 2016, 38,

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/India%20First/INDIA%20INDC%20O%20UNFCCC.pdf>.

¹⁹ "Trade Remedies: Targeting the Renewable Energy Sector" (United Nations Conference on Trade and Development (UNCTAD), 2014), 1–5, https://unctad.org/system/files/official-document/ditcted2014d3_en.pdf.

²⁰ "Trading into a Bright Energy Future: The Case for Open, High-Quality Solar Photovoltaic Markets" (World Trade Organization (WTO) and International Renewable Energy Agency (IRENA), 2021), 20, <https://www.irena.org/publications/2021/Jul/Trading-into-a-bright-energy-future-Solar-photovoltaic>.

²¹ See Ministerial Statement on Fossil Fuel Subsidies circulated on 14 December 2021 at the request of the delegations of Albania; Chile; Costa Rica; European Union; Fiji; Iceland; Liechtenstein; Moldova, Republic of; Montenegro; New Zealand; North Macedonia; Norway; Panama; Switzerland; Tonga; United Kingdom; Uruguay; and Vanuatu. WTO Document WT/MIN (21)/9/Rev.1

²² "Offshore Renewables: An Action Agenda for Deployment (A Contribution to the G20 Presidency)" (International Renewable Energy Agency (IRENA), 2021), 13, <https://www.irena.org/publications/2021/Jul/Offshore-Renewables-An-Action-Agenda-for-Deployment>.

²³ "Nationally Determined Contributions under the Paris Agreement. Synthesis Report by the Secretariat." (UNFCCC Secretariat, September 17, 2021), 39, https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf.

²⁴ "UK Nationally Determined Contribution," NDC Registry, December 12, 2020, 9, <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20Kingdom%20of%20Great%20Britain%20and%20Northern%20Ireland%20First/UK%20Nationally%20Determined%20Contribution.pdf>.

²⁵ "New Zealand NDC," NDC Registry, November 3, 2021, 9, <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/New%20Zealand%20First/New%20Zealand%20NDC%20November%202021.pdf>.

²⁶ Aik Hoe Lim, Sajal Mathur, and Gowoon Suk, "Trade and Environment: What Can We Learn from Trade Policy Reviews?," Staff Working Paper (WTO, 2020), 9, https://www.wto.org/english/res_e/reser_e/ersd202006_e.pdf.

sources to replace the need for fossil fuels. The research in this section will therefore focus on improving energy efficiency in public and private buildings.

- **Waste and pollution.** According to the UNFCCC Synthesis Report, 68% of NDCs referred to measures related to more efficiently disposing of solid waste or wastewater treatment. For example, countries from the sample list like Mauritius²⁷ and South Africa²⁸ include measures in this category. Furthermore, the presence of plastic in the sea presents a significant challenge. Thus, this report will analyse trade-related measures aimed at decreasing the use, and increasing the environmentally sound disposal of, plastics.
- **Transport.** As stated by the UNFCCC Synthesis Report, 80% of the NDCs incorporate domestic mitigation measures related to road and rail transport or shipping and aviation. From the sample list, Parties like the USA²⁹ or the EU³⁰ include in their NDCs measure to reduce greenhouse gas emissions from transport. In this section the report will address how to reduce greenhouse emissions from freight transport through trade related measures. This NDC category has gained an economic importance, as in the fringes of the COP26 100 national governments, cities, states, and major businesses signed the Glasgow Declaration on Zero-Emission Cars and Vans³¹ to end the sale of internal combustion engines by 2035 in leading markets and by 2040 worldwide. 13 nations have also committed to end the sale of fossil fuel powered heavy duty vehicles by 2040.
- **Land-use, Land-use change and forestry (LULUCF).** According to the UNFCCC Synthesis Report 75% of all NDCs include commitments related to LULUCF. For example, the NDCs of Malawi³² and Brazil³³ include measures in this category. This category of NDC has gained political salience following the Glasgow Leaders' Declaration on Forest and Land Use³⁴ which declares the 141 signatory countries' intent to "facilitate trade and development policies, internationally and domestically that promote sustainable

²⁷ "Final Updated NDC for the Republic of Mauritius," NDC Registry, October 1, 2021, 6, <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>.

²⁸ "South Africa Updated First NDC," NDC Registry, September 27, 2021, 5, <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa%20updated%20first%20NDC%20September%202021.pdf>.

²⁹ "United States NDC," NDC Registry, April 22, 2021, 4, <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20States%20of%20America%20First/United%20States%20NDC%20April%202021%20Final.pdf>.

³⁰ "EU NDC Submission," NDC Registry, December 17, 2020, 11–12, https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/European%20Union%20First/EU_NDC_Submission_December%202020.pdf.

³¹ "COP26 Declaration on Accelerating the Transition to 100% Zero Emission Cars and Vans," GOV.UK, accessed November 14, 2021, <https://www.gov.uk/government/publications/cop26-declaration-zero-emission-cars-and-vans/cop26-declaration-on-accelerating-the-transition-to-100-zero-emission-cars-and-vans>.

³² "Malawi Updated NDC," NDC Registry, July 30, 2021, 24–25, <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Malawi%20First/Malawi%20Updated%20NDC%20July%202021%20submitted.pdf>.

³³ "Brazil First NDC (Updated Submission)," NDC Registry, December 9, 2020, 8, <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>.

³⁴ "Glasgow Leaders' Declaration on Forests and Land Use," UN Climate Change Conference (COP26) at the SEC – Glasgow 2021, November 2, 2021, <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.

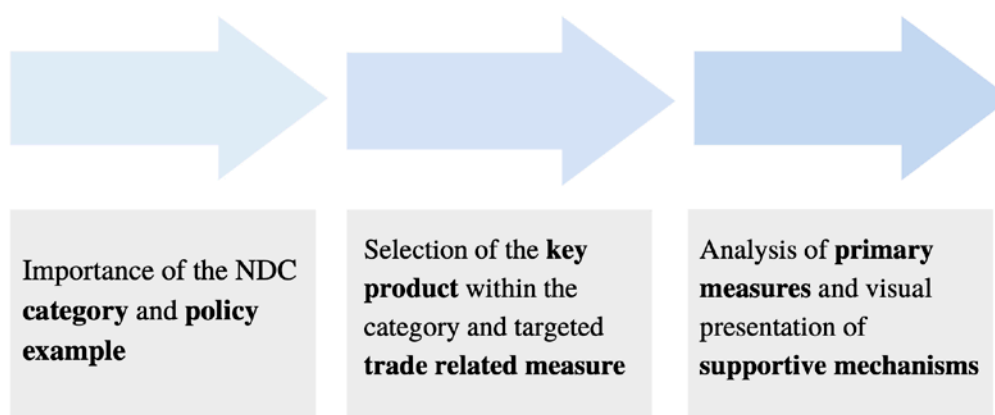
development, and sustainable commodity production and consumption, that work to countries’ mutual benefit, and that do not drive deforestation and land degradation”. In this section, the report will analyse trade measures like supply chain certification schemes that can be implemented to reclaim ecosystems and prevent deforestation. These measures could eventually lead to change of land-use that is environmentally sustainable.

3 Analysing the interaction between trade-related measures to promote most common NDCs and the WTO

This report seeks to examine the link between trade agreements and countries’ NDCs. In this regard, this section proceeds as follows:

- First, we will analyze the importance of the category and we will present a concrete policy example from one of the countries composing our sample: this is done with the aim of showing how States are actually dealing with the identified NDC category.
- Secondly, we will select one key product or service within each category to tackle a specific issue and create a targeted model trade related measure.³⁵

Figure 2: Visual representation of steps



NDC category	Most Common Mitigation Option	Key product	Primary trade Related Measure
Energy Sector	Renewable Energy Generation	Wind turbines and component parts	Tariff reduction and removal on wind turbines and

³⁵ NB: Environmental measures related to trade can take on multiple forms. Some of these directly impact trade, e.g., import bans on high emissions vehicles or tariff reductions for environmental goods. These measures can be either trade promoting or restrictive. Measures can also indirectly impact trade. For example, domestic energy efficiency standards can impact the sale of imported goods. This work will address both direct and indirect trade related measures.

			component parts
Buildings	Improvement of Energy Efficiency	Energy Saving Insulating Windows (ESIW)	Value Added Tax reduction on energy saving features
Waste and Pollution	Waste Recycling	Plastic Pollution Capture Devices	Government Procurement of plastic pollution capture devices
Transport	Improvement of Energy Efficiency	Electric Highways	Technology Transfer
LULUCF	Afforestation, Reforestation and Revegetation	Soybeans	Due diligence certification scheme

3.1 NDC Category: Energy Sector

84% of NDCs mention renewable energy generation as a means and target for climate change mitigation.³⁶ Global electricity demand is expected to rise in coming years, posing the threat of additional emissions. However, renewables are expected to be able to meet 99% of global power demand increases during 2020-2025.³⁷

Solar photovoltaics (PV) and wind power are expected to be preeminent within the renewable energy generation sector. The two are set to contribute two-thirds of renewables growth.³⁸ Growth in the renewables energy generation sector is expected to accelerate as more countries commit to mid-century net-zero goals. Part of wind and solar PV's centrality is their affordability. According to the International Energy Agency, onshore wind and solar PV are already the cheapest ways to add new electricity-generation capacity in many countries. Where favorable conditions exist, these renewable energy generation technologies can challenge existing fossil fuel plants.³⁹

While both wind and solar PV energy generation are essential to a clean energy transition, this report focuses on wind energy generation as it presents unique opportunities to examine trade-related measure and supportive policies as they relate to NDC goals.⁴⁰

³⁶ UNFCCC Secretariat, "Nationally determined contributions under the Paris Agreement," 2021. P.38

³⁷ IEA, "Renewables: Analysis and Forecast to 2025," 2020. P.34.

https://iea.blob.core.windows.net/assets/1a24f1fe-c971-4c25-964a-57d0f31eb97b/Renewables_2020-PDF.pdf

³⁸ IEA, "Global Energy Review 2021," 2021. P.22. <https://www.iea.org/reports/global-energy-review-2021>

³⁹ IEA, "Renewables: Analysis and Forecast to 2025," 2020. P.12.

https://iea.blob.core.windows.net/assets/1a24f1fe-c971-4c25-964a-57d0f31eb97b/Renewables_2020-PDF.pdf

⁴⁰ One might question why this work does not address hydropower. In addition to the aforementioned centrality of wind and solar PV to future capacity additions, there are political and environmental concerns associated with hydropower that are beyond the scope of this work.

3.1.1 Wind Turbines and Component Parts

Wind turbines and their component parts (i.e., gear boxes, tower parts, transmission roller bearings, etc.) are essential to achieving the energy transition goals of many countries.⁴¹ However, wind turbines are design-intensive products requiring significant amounts of research and development and technical expertise to design and produce.⁴² This process grants a comparative advantage to specific countries who have historically dominated the market, including design and production. The top five wind turbine producers in 2016 were Denmark, Germany, Spain, the United States, and China, collectively making up 92% of global exports.⁴³ Such concentration of expertise and the intensive design process makes it difficult for developing countries, or even untraditional producers to leapfrog the dominant producers and exporters. It is even more difficult to produce high quality turbines that produce similar volumes with reliability. As a result, the majority of wind turbines are imported. 70% of added wind power capacity was imported in 2015.⁴⁴ The importation of wind turbine technology is not limited to the physical goods. In the case of China, companies responding to technology gaps have formed partnerships with German companies who specialize in the required research and design, allowing Chinese firms to specialize in the mass production of the eventual product.⁴⁵

Technological development continues within the sector. Advancements in the design of wind turbines make wind power generation projects bankable even in areas with low wind speeds.⁴⁶ These technological developments could potentially accelerate the deployment of wind power. Intellectual property rights (IPRs) and learning costs could present a problem for developing countries, but it is apparent that there are measures within existing trade agreements that can be leveraged to advance the energy sector transition by disseminating wind turbine technology.⁴⁷

Global wind energy power capacity growth is expected to be dominated by a limited number of states, particularly China, the US, India, and the EU.⁴⁸ Growth could be expanded to include developing states through cost reductions in the associated goods and services, thereby facilitating the Paris Agreement 1.5C mitigation target. While complementary policies would be necessary, the trade measure proposed below, i.e.,

⁴¹ WTO, "Making Trade Work for the Environment, Prosperity and Resilience," 2018. P.41. <https://doi.org/10.30875/f14f8c90-en>

⁴² Garsous, Grégoire, and Stephan Worack, "Trade as a channel for environmental technologies diffusion: The case of the wind turbine manufacturing industry," 2021. P.8.

⁴³ Garsous, Grégoire, and Stephan Worack, "Trade as a channel for environmental technologies diffusion: The case of the wind turbine manufacturing industry," 2021. P.10.

⁴⁴ Garsous, Grégoire, and Stephan Worack, "Trade as a channel for environmental technologies diffusion: The case of the wind turbine manufacturing industry," 2021. P.8.

⁴⁵ Garsous, Grégoire, and Stephan Worack, "Trade as a channel for environmental technologies diffusion: The case of the wind turbine manufacturing industry," 2021. P.19.

⁴⁶ IEA, "Renewables: Analysis and Forecast to 2025," 2020. P.79-81. https://iea.blob.core.windows.net/assets/1a24f1fe-c971-4c25-964a-57d0f31eb97b/Renewables_2020-PDF.pdf

⁴⁷ WTO-UNEP, "Trade and Climate Change", 2009. P.111. https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

⁴⁸ IEA, "Renewables: Analysis and Forecast to 2025," 2020. https://iea.blob.core.windows.net/assets/1a24f1fe-c971-4c25-964a-57d0f31eb97b/Renewables_2020-PDF.pdf; IEA, "Global Energy Review 2021," 2021. <https://www.iea.org/reports/global-energy-review-2021>

tariff reduction, would advance this goal for both developed and developing member states.

3.1.2 Reducing tariff barriers to wind turbine *component parts* and WTO Compatibility

Trade in wind turbines spurs the proliferation of environmentally friendly technologies and displaces ‘dirty’ forms of power generation. Therefore, “barriers to trade in wind turbines are also barriers to the dissemination of key environmental technologies”.⁴⁹ Tariff rates on finished wind turbines (HS code 850231)⁵⁰ are relatively low.⁵¹ However, there are numerous parts that go into a finished turbine. Removal or reduction of tariffs and non-tariff barriers on these components would contribute to greater efficiencies of scale, reducing the costs associated with wind turbines. Such cost reductions could contribute to a broader dissemination of renewable energy technology, contributing to the NDC goals of 84% of Paris Agreement signatories.⁵² These parts are delivered to producers by complex global supply chains which often cross state borders numerous times prior to assembly (or finishing).⁵³ This can lead to the steady accumulation costs from tariff barriers, which are reflected in the price of the finished product.

The simple average of the MFN tariff rate applied by all WTO members on wind turbine gear boxes is 6.3%, 6.3% for transmission shafts, 5.8% for special roller bearings, and 9.6% for tower parts.⁵⁴ Specifically, India and China impose on average 10% and 8% of ad valorem duties on finished wind turbines, respectively. Other trading countries, like Brazil or South Africa, impose 0% ad valorem duties on the same goods. Countries like the United States of America impose on finished wind turbines (HS code 850231) a minimum ad valorem duty of 0% and a maximum of 2.5%. Since 2018, the USA applies in practice an average of 1.3% ad valorem duty to finished wind turbines. Likewise, Australia imposes between a 0-5% ad valorem duty. Since 2019 Australia has in practice imposed a 2.5% ad valorem duty.

Considering the importance of these types of goods for reaching the global target set by the Paris Agreement, WTO Members should consider lowering their applied tariff duties to 0%. Lowering customs duties is allowed, provided this is done in accordance with the principle of most-favored nation (MFN) set out in GATT Article I:1, which provides that “any advantage, favor, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be awarded immediately and unconditionally to the like product originating in or destined for the

⁴⁹ Garsous, Grégoire, and Stephan Worack, “Trade as a channel for environmental technologies diffusion: The case of the wind turbine manufacturing industry,” 2021. P.2.

⁵⁰ “Electric generating sets; wind-powered, (excluding those with spark-ignition or compression-ignition internal combustion piston engines)” UNSD - Classification Detail. United Nations. United Nations Statistics Division. <https://unstats.un.org/unsd/classifications/Econ/Detail/EN/2089/850231>

⁵¹ NB: ‘Finished’ here refers to both fully assembled turbines and to unassembled turbines, with all component parts presented to customs together.

⁵² UNFCCC Secretariat, “Nationally determined contributions under the Paris Agreement,” 2021.

⁵³ WTO, “Making Trade Work for the Environment, Prosperity and Resilience,” 2018. P.40. <https://doi.org/10.30875/f14f8c90-en>

⁵⁴ WTO, “Making Trade Work for the Environment, Prosperity and Resilience,” 2018. P.41. <https://doi.org/10.30875/f14f8c90-en>

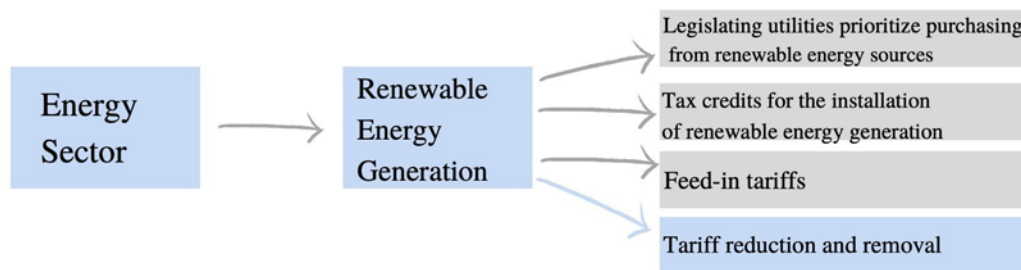
territories of all other contracting parties”. This means that any reduction of tariffs on wind turbine components must be granted to all other WTO Member States.

Some countries have taken steps towards reducing tariffs on turbine component parts. For example, in 2012 the countries of the Asia-Pacific Economic Cooperation (APEC) agreed to reduce tariffs on 54 environmental goods to 5% by the end of 2020.⁵⁵ The APEC list of environmental goods includes wind turbine component parts like engine and motor parts (HS code 841290) needed to produce wind turbine hubs and blades. However, components such as towers and lattice masts (HS 730820) required to produce wind turbines were not included in the list from 2012. Moreover, according to the APEC Market Access Group responsible for monitoring the implementation of the APEC list of Environmental Goods, in 2021 only 19 of 21 APEC members are fully compliant with the initiative.⁵⁶ Hence, there remains a need for further implementation.

At the WTO level, formal negotiations between 46 countries were launched in 2014 to agree on an Environmental Goods Agreement (EGA). However, in 2016 negotiations collapsed when negotiators failed to find common ground on which goods would be covered by the proposed agreement.

Figure 3 shows the different trade related measures that governments can adopt to better achieve renewable energy generation: in this case the primary measure would be the tariff reduction and removal on wind turbines components parts, while the remaining measures stand as supportive mechanisms.

Figure 3: Energy sector and trade related measures



While this work analyzes in detail only the above proposed measure, removal of trade barriers must be paired with robust domestic policy responses, to include where necessary, regulatory, and fiscal incentives to create a push-pull effect promoting production and demand.

⁵⁵ Annex C-APEC List of Environmental Goods available here https://www.apec.org/meeting-papers/leaders-declarations/2012/2012_aelm/2012_aelm_annexc.

⁵⁶ “APEC Advances Environmental Goods Tariffs Cut,” APEC, accessed November 28, 2021, https://www.apec.org/press/news-releases/2021/0311_mag

3.2 NDC Category: Buildings

According to the International Energy Agency and UNEP, energy demand from buildings will increase 50% by 2050 because of rapid urbanization in many countries and the doubling of the built surface area.⁵⁷ This category's importance for achieving the Paris Agreement goals is thus evident. Not surprisingly, this potential was well recognized by parties to the Paris Agreement with 72% of them directly referring to this category in their NDCs.⁵⁸

For example, the European Commission has strengthened its commitment towards this specific NDC sector by presenting the “*renovation wave for Europe – Greening our buildings, creating jobs, improving lives*” initiative as part of the European Green deal. The main goal is to double the annual energy renovation rate of buildings by 2030.⁵⁹ With affordability representing one of the key aspects for a successful renovation wave towards 2030 and 2050, the European Commission estimates that a lack of simple and easily attractive public incentives for renovation is one of the largest obstacles for the achievement of a substantial affordability in this sector.⁶⁰ A significant impact could be achieved by complementing EU instruments with the adoption of supporting national measures.⁶¹ It is within this framework that trade measures can be leveraged to support building category related goals.

3.2.1 Key Product: Energy Saving Insulating Windows

The most frequently indicated mitigation option associated with the “Buildings” category is Energy Efficiency Improvement. This can be achieved through both the reduction of energy consumption and better insulation.⁶² 40% of national policy actions dealing with the buildings category are related to developing new building energy codes.⁶³ These can be defined as “*codes and standards setting minimum efficiency requirements for new and renovated buildings, assuring reductions in energy use and emissions over the life of the building*”.⁶⁴

⁵⁷ UN Environment Programme, “*A guide for incorporating buildings actions in NDCs*”, 2018.

⁵⁸ UNFCCC Secretariat, “Nationally determined contributions under the Paris Agreement”, 2021. 37. https://unfccc.int/sites/default/files/resource/cma2021_08E.pdf

⁵⁹ European Commission, “*Energy performance of buildings directive*”, 2021.

https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en

⁶⁰ European commission, “*A Renovation Wave for Europe – greening our buildings, creating jobs, improving lives*”. Communication from the Commission to the European Parliament, the Council, the European Economic and social committee and the Committee of the Regions, 2020. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0662>

⁶¹ European commission, “*A Renovation Wave for Europe – greening our buildings, creating jobs, improving lives*”. Communication from the Commission to the European Parliament, the Council, the European Economic and social committee and the Committee of the Regions, 2020. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0662>

⁶² GIZ, “Sectoral implementation of nationally determined contributions: energy efficiency with a focus on buildings”, May 2017. p 6. <https://transparency-partnership.net/sites/default/files/u2618/giz2017-en-ndcs-sectoral-implementation-energy-efficiency.pdf>

⁶³ UN Environment Programme, “*A guide for incorporating buildings actions in NDCs*”, 2018. p 13. https://globalabc.org/sites/default/files/2020-03/GABC-NDC-GUIDE_ENGLISH.pdf

⁶⁴ Office of Energy Efficiency and Renewable Energy - U.S. Department of Energy, “Window Types and Technologies”. <https://www.energy.gov/energysaver/window-types-and-technologies>

A more attentive analysis of the building sector's potential and gaps reveals that while the sector itself counts for half of global electricity consumption, its potential for energy efficiency is among the most unrealized.⁶⁵ This means that if the energy demand of buildings can be reduced, a significant impact in emissions reductions can be achieved. While an important part of the renovation process is equipping buildings with green energy supply technologies, aimed at reducing dependence on brown sources of energy, another way of approaching the problem is to limit the consumption of energy itself. This could represent an important first step for many countries, but especially for those that do not have sufficient know-how or financial resources to invest in the development of green technologies. The consumption and demand of energy can be drastically reduced if buildings are equipped with windows that limit heat or cooling dispersion. Made from materials that transfer neither heat nor cold, these windows are aimed at limiting, if not completely eliminating, thermic dispersion. This means less energy is required to heat and cool buildings.

The production of Energy Saving Insulated Windows involves the use of different materials and components depending on the part of the window that is produced. Windows frames are usually made from vinyl, wood, fiberglass, or laminated strand lumber because of their insulating properties.⁶⁶ While frames are important in the overall insulating level of the window, the greatest impact comes from the glazing.⁶⁷ To fall within the category of "insulated window glazing", the window needs to be composed by two or more panes of glass spaced apart to leave an insulating air space. Moreover, an extra level of insulation can be added by using low-emissivity glass coatings, a metallic oxide layer on the surface of the panes of glass.⁶⁸ Applying insulating technology can increase the product's final price by 10%-15%, but the reduction of energy loss ranges from 30% to 50%.⁶⁹

The choice of this precise product is supported by the findings of a recent study showing that ESIW systems have optimal energy saving properties, and broad adaptability and operability.⁷⁰ According to the International Energy Agency, more than half of buildings' energy demand comes from cooling and heating.⁷¹ Reducing dispersion is therefore crucial.

⁶⁵ GIZ, "Sectoral implementation of nationally determined contributions: energy efficiency with a focus on buildings", May 2017. 1. <https://transparency-partnership.net/sites/default/files/u2618/giz2017-en-ndcs-sectoral-implementation-energy-efficiency.pdf>

⁶⁶ Office of Energy Efficiency and Renewable Energy - U.S. Department of Energy, "Window Types and Technologies". <https://www.energy.gov/energysaver/window-types-and-technologies>

⁶⁷ Office of Energy Efficiency and Renewable Energy - U.S. Department of Energy, "Window Types and Technologies". <https://www.energy.gov/energysaver/window-types-and-technologies>

⁶⁸ Office of Energy Efficiency and Renewable Energy - U.S. Department of Energy, "Window Types and Technologies". <https://www.energy.gov/energysaver/window-types-and-technologies>

⁶⁹ Office of Energy Efficiency and Renewable Energy - U.S. Department of Energy, "Window Types and Technologies". <https://www.energy.gov/energysaver/window-types-and-technologies>

⁷⁰ Wang, Z.; Tian Q.; Jia, J., "Numerical Study on Performance Optimization of an Energy-Saving Insulated Window". Sustainability, 2021.

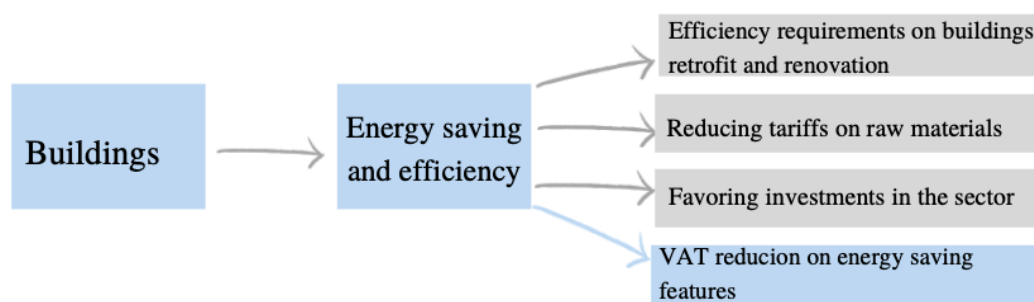
⁷¹ IEA, "Energy Efficiency: market trends and medium-term prospects". 2013, Paris. <https://doi.org/10.1787/9789264206052-en>.

3.2.2 VAT reductions on energy saving features and WTO compatibility

Despite green technologies and the potential of green materials having already penetrated the market in many countries, there is still room for policies and practices to be improved. One straightforward approach seems to make sustainable materials “readily and easily obtainable”.⁷² According to the International Energy Agency, government stimulus spending targeting both building retrofits and efficient new buildings is one of the few factors with a potential positive impact on energy intensity improvement.⁷³ Governments could intervene in different ways: by legislating efficiency requirements on building retrofit and new construction; labeling on products used in the processes; reducing tariffs on materials required to produce energy saving features; favoring investments in the sector; providing financial incentives to encourage the deployment of climate-friendly goods like EISW. These incentives would mainly be aimed at providing support to reduce the costs of the final product incentivizing its purchase.⁷⁴

Figure 4 shows the different trade related measures that governments can adopt to better achieve energy saving and efficiency: in this case the primary measure would be the VAT reduction on energy saving features, while the remaining ones are supportive mechanisms.

Figure 4: Buildings and trade related measures



More precisely, value added tax (VAT) reduction stands as a fiscal incentive that could reduce taxes on energy saving features like ESIW and could be targeted at consumers. Rewarding the installation of such products would increase consumer demand, subsequently leading to a shift in production towards more energy efficient goods.

Such governmental funding interventions, however, have implications for international trade. For example, reducing taxes on a certain category of products would lead to lower prices of the final good. This, in turn, could imply reduce access for imports in the implementing country, or increased exports.⁷⁵

⁷² Sangster, W., “Benchmark Study on Green Buildings: Current Policies and Practices in Leading Green Building Nations”, 2006. <http://www3.cec.org/islandora-gb/fr/islandora/object/greenbuilding%3A143/datastream/OBJ-EN/view>

⁷³ International Energy Agency, “Energy Efficiency 2020”, 2020. <https://www.iea.org/reports/energy-efficiency-2020/buildings>

⁷⁴ WTO-UNEP, “Trade and Climate Change”, 2009. P.113. https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

⁷⁵ WTO-UNEP, “Trade and Climate Change”, 2009. P.115. https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

Non-discrimination and transparency are among the core principles informing WTO law. Hence, trade related measures should not distort competition in an unfair and disadvantageous way.⁷⁶ More precisely, Article III of the General Agreement on Tariffs and Trade (GATT) sets out the National Treatment Principle which prohibits WTO Members from imposing any internal taxation or domestic regulation that results in favoring domestic products over like foreign ones.⁷⁷ Therefore, the non-discrimination obligation imposes the consideration of two elements: a less favorable treatment and the likeness of products. The proposed value added tax reduction on ESIW would need to be adopted in respect of this fundamental principle of WTO and not discriminate, neither *de jure* nor *de facto*, against imported like products. It follows that the same level of taxation, following the VAT reduction, would have to apply to both domestically produced ESIW and imported like products.

In other words, the VAT reduction must fulfill the requirements set in Article III:2 of the GATT 1994 and further developed by the case law as the three-tier test of consistency for the internal taxation to be WTO compatible. In *China— Auto Parts*⁷⁸ as it requires the examination of:

- Whether the measure at issue is an internal tax or other internal charge on products;
- Whether the imported and domestic products are like products; and
- Whether the imported products are taxed in excess of the domestic products.

In the present case, the VAT tax is an internal tax that is applied to all products sold within a given country. The measure proposed would consist of decreasing the VAT on all insulating windows irrespective where they have been produced. As a result, the second element of the test of consistency with the national treatment obligation of Article III:2 of the GATT 1994 would be fulfilled as the measures applies to both imported and domestic products alike provided that the product is the same in both cases: insulating windows. Lastly, the third element of the test of consistency relates to the question of whether the imported products are taxed in excess of the domestic products. As all types of insulating windows would benefit of a decrease of VAT there is no difference between products. Therefore, the conditions set in Article III:2 of the GATT 1994 are met.

On the other hand, depending on how the measure is framed, scoped and implemented, it might take the form of a subsidy. When dealing with fiscal measures like tax reductions and governmental funding policies, the Agreement on Subsidies and Countervailing Measures (SCM) becomes of fundamental importance.⁷⁹ The Agreement provides the definition of subsidies, describes the conditions under which

⁷⁶ WTO-UNEP, "Trade and Climate Change", 2009. p. 116.

https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

⁷⁷ Cuardos, M., "The Non-discrimination Principle and VAT: Rules of Thumb for Trade and Tax Policy-Makers", 2016. Global Trade and Custom Journal 62-70.

⁷⁸ China — Measures Affecting Imports of Automobile Parts, No. WT/DS339/AB/R, WT/DS340/AB/R, WT/DS342/AB/R (Report of the Appellate Body December 15, 2008).

⁷⁹ WTO-UNEP, "Trade and Climate Change", 2009. P.115.

https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

they can, or cannot, be implemented by Member States, and regulates the remedies to deal with the potential negative market-effects measures might have.⁸⁰ According to Article 1 of the SCM Agreement a subsidy needs to show specific traits to be defined as such: more precisely, a subsidy exists if a financial contribution, conferring a benefit, has been provided by a government or a public body within the territory of a WTO Member.⁸¹ A financial contribution by the Government can be put in place in different ways and the SCM Agreement provides an exhaustive list which includes direct transfer of funds, potential direct transfer of funds, government revenue forgone, and government purchase of goods. It is therefore clear that a VAT reduction on energy saving features like ESIW could represent an example of Government revenue forgone.⁸² More difficult is to determine whether such a financial contribution confers a benefit to a certain industry or to a category of industries, but as ruled by the Appellate Body in the *Canada— Aircraft* case, this can be done by analyzing the situation in the marketplace by comparing the hypothetical circumstances for the recipient of the subsidy if the subsidy was not in place.⁸³

Moreover, subsidies need not be specific as laid out in Article 2: “if a subsidy is specifically limited to certain enterprises by the granting authority or the law under which the granting authority operates, then it is specific” and therefore prohibited.⁸⁴ Given the pillars informing all WTO law are the non-discrimination principle, MFN rule and National Treatment, subsidies must not be contingent upon either export performance or the use of domestic goods over imported ones, as clearly stated in Article 3 of the SCM Agreement.⁸⁵ Concerning the latter, of particular relevance is *US—Tax Incentives*, where the Appellate Body noted that Article 3.1(b) of the SCM Agreement does not prohibit the subsidization of domestic production per se, but rather the granting of subsidies aimed at favoring domestic over imported goods. The fact that the presence of a subsidy can lead to an increase of supply of the subsidized domestic good and to a consequent downstream reduction of imports, doesn’t automatically imply that the subsidy was put in place with the condition of distorting competition between domestic and imported goods.⁸⁶

To conclude, for the VAT reduction on the final product to be WTO consistent the following elements need to be present:

- It would have to apply to both domestically produced ESIW and imported like products (Art. III GATT);

⁸⁰ WTO-UNEP, “Trade and Climate Change”, 2009. P.116.

https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

⁸¹ WTO-UNEP, “Trade and Climate Change”, 2009. P.116.

https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

⁸² WTO-UNEP, “Trade and Climate Change”, 2009. P.116.

https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

⁸³ WTO-UNEP, “Trade and Climate Change”, 2009. P.116.

https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

⁸⁴ Pauwelyn J., Guzman A. T., Hilman J. A., “*International Trade Law*”, Third Edition, Wolters Kluwer, New York, 2016.

⁸⁵ Pauwelyn, J., Guzman, Andrew T., Hillman, Jennifer A., “*International Trade Law*”. 2016. Third Edition.

⁸⁶ WTO, “*WTO analytical index: SCM Agreement – Article 3 jurisprudence*”.

https://www.wto.org/english/res_e/publications_e/ai17_e/subsidies_art3_jur.pdf

- It should not be specific and therefore not granted on specific enterprises in absence of an objective criteria (Art. 2.1 SCM);
- It should not be put in place to favor the use of domestic goods over imported ones (Art. 3.1(b) SCM).

3.3 NDC Category: Waste and Pollution

The waste sector presents an obstacle to accomplishing the goals laid out in NDCs and the Paris Agreement. Waste was a target sector for 68% of NDCs, with waste recycling being the most commonly mentioned mitigation option at 30% of NDCs.⁸⁷ Plastic waste generation is of particular concern. Plastics contribute to climate change in two principal ways.⁸⁸ First, they hinder ocean capacity for carbon fixation, with the potential to take up 13% of the global carbon budget until 2050.⁸⁹ This drastically increases the difficulty of achieving the Paris Agreement's mitigation goals. Second, they contribute to GHG emissions throughout their lifecycle, from extraction of the natural resources used, to production, and on to recycling or disposal. While recycling plastic wastes is preferable to open-dumping or burning, it is not a straightforward process.⁹⁰

Plastics make up at least 85% of total marine waste.⁹¹ They make up the most harmful and persistent fraction of marine waste, with negative effects for the environment, human health, and marine economies. When plastics break down in the marine environment, they can create microplastics,⁹² a more harmful subcategory of plastic debris. In addition to the risk of ingestion by marine life, plastic debris can pollute marine environments with a variety of toxic chemical and metals, as well as serving as vectors for harmful pathogenic organisms.⁹³

While urgent action in this area is required by all countries, Indonesia's approach is of particular relevance. Indonesia specifically refers to the waste and pollution sector in its NDC and its eventual success could have outsized positive impacts on the marine ecosystem as a whole. With a population of 250 million, Indonesia is the world's 4th most populous country and the second-largest plastic polluter. The commitments of the Indonesian government in undertaking significant steps towards a less polluted environment are evident from the two recently adopted Presidential Decrees: one on national policy and strategy on management of household waste and household-like waste and the other on marine debris management.⁹⁴

⁸⁷ UNFCCC Secretariat, "Nationally determined contributions under the Paris Agreement," 2021. P. 37-38.

⁸⁸ Goncalves, L., "The Effects of Plastic on Climate Change: An Analysis of the Potential Responses within the Nationally Determined Contributions (NDCs)," 2021. P. 1.

⁸⁹ Goncalves, L., "The Effects of Plastic on Climate Change: An Analysis of the Potential Responses within the Nationally Determined Contributions (NDCs)," 2021. P. 3.

⁹⁰ Kaza et al. "What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050," 2018. P. 4.

⁹¹ UNEP, "From Pollution to Solution: A Global Assessment of Marine Litter and Plastic Pollution," 2021. P. 3.

⁹² Plastic debris measuring less than 5mm in length; see: National Oceanic and Atmospheric Administration, 2021, <https://oceanservice.noaa.gov/facts/microplastics.html>

⁹³ UNEP, "From Pollution to Solution: A Global Assessment of Marine Litter and Plastic Pollution," 2021. P. 3.

⁹⁴ Ministry of Environment and Forestry, Republic of Indonesia, "National *Plastic Waste Reduction Strategic Actions for Indonesia*", 2020.

Specifically, the Ministry of Environment and Forestry of Indonesia formulated the National Plastic Waste Reduction Strategic Actions in partnership with institutions like UNEP, with the aim of creating the best setting for a full implementation of the decrees⁹⁵. Among the strategic goals listed in the action plan is the reduction of debris emitted into the ocean by 70% by 2025.⁹⁶ To conclude, the Indonesian strategic action plan stands as an innovative and comprehensive framework for waste reduction and management. It not only envisions the planning and the implementation of the strategy, but also includes the review and assessment of adopted actions to identify weaknesses and modify them accordingly.⁹⁷

3.3.1 Key Product: Plastic Pollution Capture Devices

There is no silver bullet to solve plastic pollution, but preventing the flow of plastics into the marine environment is a critical mitigation requirement.⁹⁸ Rivers are the dominant pathway by which plastic waste pollution flows into the ocean. 80% of marine plastic pollution flows into the ocean from 1,000 rivers worldwide.⁹⁹ Capturing and removing plastic pollution from the ocean itself is a technologically challenging feat that has not yet been achieved at real scale.¹⁰⁰ On the other hand, prevention through capture within fresh water environments is underutilized despite its potential for greater impact.¹⁰¹ Moreover, prevention is a relatively affordable strategy with accessible and readily-deployable technological solutions.¹⁰²

Since 2015, there has been a proliferation of companies developing technologies intended to address this gap.¹⁰³ The result is a catalogue of plastic pollution capture devices states can select from. Devices can broadly be categorized in three ways:

<https://wedocs.unep.org/bitstream/handle/20.500.11822/32898/NPWRSI.pdf?sequence=1&isAllowed=y>

⁹⁵ Ministry of Environment and Forestry, Republic of Indonesia, “*National Plastic Waste Reduction Strategic Actions for Indonesia*”, 2020.

<https://wedocs.unep.org/bitstream/handle/20.500.11822/32898/NPWRSI.pdf?sequence=1&isAllowed=y>

⁹⁶ Ministry of Environment and Forestry, Republic of Indonesia, “*National Plastic Waste Reduction Strategic Actions for Indonesia*”, 2020.

<https://wedocs.unep.org/bitstream/handle/20.500.11822/32898/NPWRSI.pdf?sequence=1&isAllowed=y>

⁹⁷ Ministry of Environment and Forestry, Republic of Indonesia, “*National Plastic Waste Reduction Strategic Actions for Indonesia*”, 2020.

<https://wedocs.unep.org/bitstream/handle/20.500.11822/32898/NPWRSI.pdf?sequence=1&isAllowed=y>

⁹⁸ Dijkstra, H., van Beukering, P., Brouwer, R., “In the business of dirty oceans: Overview of startups and entrepreneurs managing marine plastic,” 2021. P. 1.

⁹⁹ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 1.

¹⁰⁰ Goncalves, L., “The Effects of Plastic on Climate Change: An Analysis of the Potential Responses within the Nationally Determined Contributions (NDCs),” 2021. P. 22.

¹⁰¹ Dijkstra, H., van Beukering, P., Brouwer, R., “In the business of dirty oceans: Overview of startups and entrepreneurs managing marine plastic,” 2021. P. 8-9.

¹⁰² Kershaw, P., “Marine plastic debris and microplastics—Global lessons and research to inspire action and guide policy change,” UNEP, 2016. P. 153.

¹⁰³ Dijkstra, H., van Beukering, P., Brouwer, R., “In the business of dirty oceans: Overview of startups and entrepreneurs managing marine plastic,” 2021. P. 1.

booms, receptacles, and watercraft vehicles.¹⁰⁴ Booms act as barriers that guide debris floating in the water. Receptacles are containers that accumulate and contain debris. Watercraft vehicles are buoyant structures intended to travel on or above water. Many devices are hybrids, integrating features from two or more of the above categories.¹⁰⁵ The majority of presently available devices cannot capture microplastics.¹⁰⁶ However, continued investment and the number of novel technological solutions provide some indication that this could be possible in the future. Macroplastic pollution mitigation remains a critical environmental goal.

Capacities, efficiencies, and operation methods vary for these devices. That said, a device suitable for one environment may not be suitable for all, depending on local conditions like weather, flow-rate, and the volume of plastic pollution.¹⁰⁷ While this report focuses on the capture of plastics within rivers due to their outsized role in oceanic plastic pollution, many plastic pollution capture devices can be deployed in coastal areas like harbors, ports, and estuaries.¹⁰⁸ A smaller subset can be deployed offshore. That said, this work emphasizes the necessity of capturing plastics prior to entering the marine environment.

3.3.2 Government Procurement of Plastic Pollution Capture Devices and WTO Compatibility

90% of the companies producing plastic pollution capture devices are located in high income countries, with 10% dispersed among upper and lower middle-income countries.¹⁰⁹ Many of these companies are headquartered in North America or Europe, but deploy their devices in Southeast Asia.

Most companies producing plastic pollution capture devices market their products to governments, including local municipalities.¹¹⁰ Therefore, this study proposes governments establish procurement contracts for plastic pollution devices to be deployed nationally and sub-nationally. Given the variability of local conditions and related efficiencies of plastic pollution capture devices, states should consider procuring multiple types in order to maximize collection.¹¹¹ Hence, contract criteria can be dictated based on local conditions, including funding availability. For example, should a government have limited funding available, systems requiring extensive maintenance or active operation should be avoided in favor of more affordable,

¹⁰⁴ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 2.

¹⁰⁵ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 2-3.

¹⁰⁶ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 3.

¹⁰⁷ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 7-9.

¹⁰⁸ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 7.

¹⁰⁹ Dijkstra, H., van Beukering, P., Brouwer, R., “In the business of dirty oceans: Overview of startups and entrepreneurs managing marine plastic,” 2021. P. 5.

¹¹⁰ Dijkstra, H., van Beukering, P., Brouwer, R., “In the business of dirty oceans: Overview of startups and entrepreneurs managing marine plastic,” 2021. P. 6.

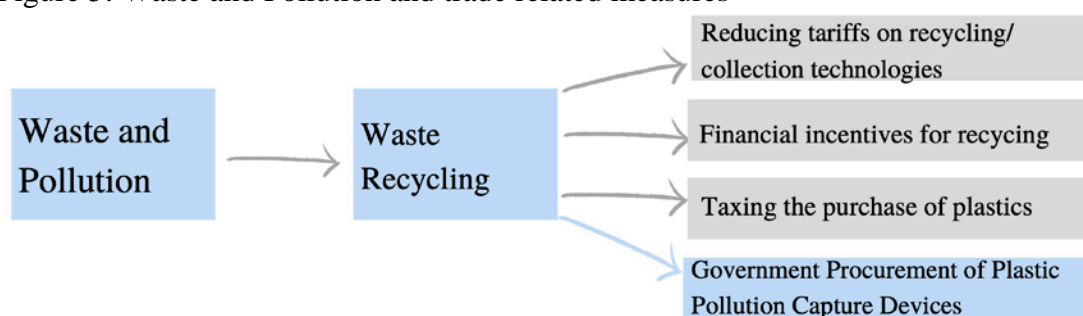
¹¹¹ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 9.

autonomous systems.¹¹² These could include independent booms or receptacles that require only positioning and collection of accumulated debris.

Collection is only as effective as the subsequent disposal of waste. If plastics are improperly disposed of, as 37% of plastic waste presently is, then little benefit is gained.¹¹³ Improved prevention and collection must be coupled with improved disposal and recycling capacities. Ultimately, the most effective solution is not technological, but ending the demand and production of plastics.¹¹⁴

Figure 5 shows the different trade related measures that governments can adopt to improve waste recycling: in this case the primary measure would be the government procurement of plastic pollution capture devices, while the remaining ones are supportive mechanisms.

Figure 5: Waste and Pollution and trade related measures



Public procurement primarily serves the aim of satisfying the needs of the public bodies of the state. There is a contracting authority or procuring entity that seeks to purchase from external providers (usually called tenderers, bidders, suppliers or economic actors) products and services. In general, the rules of public procurement are governed by national law as the public procurement sector has traditionally been sheltered from foreign competition. However, a select WTO Members sought to liberalize the government procurement market and negotiated the Agreement of Government Procurement (GPA).

The GPA is a plurilateral agreement, which means that only those WTO Members that have ratified the agreement are bound by it. At present, the GPA has been only ratified by 48 WTO members¹¹⁵ including the EU, the USA, Australia, Canada, the UK, and Japan. Another 35 WTO members are observers of the work of the WTO Committee on Government Procurement including China, India, Russian Federation, Saudi Arabia and Indonesia, who became observers on 31 October 2012.

The GPA applies only to “covered procurement” (Article II:1 GPA). However, the question of what is covered or not varies from country to country, as Signatories may

¹¹² Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 9.

¹¹³ Helinski, O., et al., “Ridding our rivers of plastic: A framework for plastic pollution capture device selection,” 2021. P. 1.

¹¹⁴ Dijkstra, H., van Beukering, P., Brouwer, R., “In the business of dirty oceans: Overview of startups and entrepreneurs managing marine plastic,” 2021. P. 1.

¹¹⁵ See full list of Parties, observers and accessions of the GPA available here https://www.wto.org/english/tratop_e/gproc_e/memobs_e.htm

negotiate coverage as specified in their individual schedules listed in Appendix I.¹¹⁶ Article II GPA lays out the criteria defining 'covered procurement' that falls under the scope of the GPA. To summarize, the purchasing entity must be a listed government actor engaging in contractual procurement for its own purposes to a value exceeding that specified in each nation's schedule. Furthermore, GPA Article XV:5 requires the contract be granted to the most advantageous tenderer as defined in Article X:9. This is usually determined by price, but performance and environmental criteria can play a role.

For the purposes of analyzing the proposed measure of government procurement of plastic pollution capture devices, this report will analyze the example of Canada as one of the signatories of the GPA. Under the coverage schedule of Canada included in Annex 1, 78 central government entities including the Department of the Environment or the Department of Natural Resources could make a public offer bid to purchase plastic pollution capture devices under the GPA if the contract has a minimum threshold of 238,000 Canadian dollars in the case of goods. Likewise, the sub-central government entities of Canada (its 10 provinces and 3 territories) are subject to the GPA and have liberalized their procurement markets for any contract of goods greater than 650,000 Canadian dollars. Hence, Canada, and for that matter any party of the GPA, could buy plastic capture devices through public procurement open not only to domestic producers, but also to foreign producers. Competitive bidding by tenderers could reduce the price of environmentally essential technologies, contributing to their increased use and facilitating the achievement of the Paris Agreement targets.

3.4 NDC Category: Transport

Among the various resources that can be utilized to strengthen climate action, the transport sector plays a significant role. This category stands at the heart of human economic and social activities. Driven by GDP, population and urban growth, demand for transportation of both people and goods is rapidly increasing.¹¹⁷ According to statistics, the lack of concrete action in the transport sector will likely lead to GHG emissions that are three to six times higher than the standards set in the Paris Agreement.¹¹⁸ Therefore, to meet the ambitious goals of 2050, transformation is critical.

The transport category's potential rests in the synergies it embodies. Transport is a major element of the global economy, as international trade is dependent on the transportation of goods and the movement of people across borders. It represents a strategic sector to explore to meet several Sustainable Development Goals.¹¹⁹ In fact, making transport as efficient as possible, while also making it more sustainable by decarbonizing it, would benefit the economic and logistics sectors, but would also stand as an opportunity to strengthen the transport infrastructure in countries with improvement needs. Improvement would help bridge the developed-developing gap. More robust transport infrastructure allows for smoother transportation and easier connections between and within countries. Optimized and planned routes can improve

¹¹⁶ See coverage schedules of the GPA available here

https://www.wto.org/english/tratop_e/gproc_e/gp_app_agree_e.htm

¹¹⁷ World Resources Institute, "*Resources for Strengthening Climate Action: Transport Sector*", 2019.

¹¹⁸ World Resources Institute, "*Resources for Strengthening Climate Action: Transport Sector*", 2019.

¹¹⁹ World Resources Institute, "*Resources for Strengthening Climate Action: Transport Sector*", 2019.

shipping conditions. In this way trade can be facilitated, economic relations among countries strengthened, and emissions reduced. The mutual benefit that action in this category can bring to logistics, the economy, and climate preservation is therefore evident.

The transport sector's potential is well recognized by the Parties to the Paris Agreement, with 80% of directly referring to it in their NDCs. Moreover, the top priority area within the category is road transport, while the most common mitigation option is energy efficiency improvement.¹²⁰ The implications of this category for climate change are evident if one considers that the goods transport sector is not only one of the major sources of greenhouse gas emissions, but also represents almost 64% of end-use petroleum consumption worldwide.¹²¹ Moreover, the choice of road transport is self-explanatory if we consider the recent findings of the International Energy Agency: road vehicles like cars, trucks and buses, account for nearly three quarters of transport CO₂ emissions; and, rising global GDP in 2019, together with the proliferation of online commerce and rapid delivery, contributes to the continuous rise of road freight demand.¹²²

Particularly interesting in the transport field is the NDC transport initiative for Asia which aims to promote a coherent strategy of effective policies for decarbonizing transport in China, India and Vietnam.¹²³ The fact that the Indian transport sector is almost completely dependent on fossil fuels makes the country particularly relevant.¹²⁴ The Indian government has already taken a number of measures aimed at making transport greener. The Faster Adoption and Manufacturing of Hybrid and EV scheme of 2015 (FAME) and its 2019 update known as FAME II are particularly ambitious. The schemes provide for subsidies aimed at incentivizing the purchase of EVs and the deployment of charging infrastructures.¹²⁵ Moreover, India further strengthened its policy commitment in the sector by introducing the Production Linked Incentive Scheme (PLI) for the manufacturing of Advanced Cell Chemistry (ACC) battery storage.¹²⁶ ACC are new generation batteries able to store electric energy in electromechanical or chemical form and convert it back to energy when required. Under the scheme, selected manufacturers of ACC batteries will benefit from injected finances to support their activities and will have to set up a

¹²⁰ UNFCCC Secretariat Synthesis Report, "Nationally Determined Contributions under the Paris Agreement", 2021.

¹²¹ Bilogistik, "Towards more environmentally friendly goods transport", 2016.

¹²² International Energy Agency, "Tracking Transport 2020", 2020.

¹²³ International Transport Forum, "NDC Transport Initiative for Asia", 2021.

¹²⁴ International Transport Forum, "NDC Transport Initiative for Asia", 2021.

¹²⁵ IEA, "Faster Adoption and Manufacturing of Hybrid and EV. FAME II", 2021.

<https://www.iea.org/policies/7450-faster-adoption-and-manufacturing-of-hybrid-and-ev-fame-ii>

¹²⁶ N. Bhardwaj, "India's PLI scheme for ACC Battery Storage manufacturing", 2021.

<https://www.india-briefing.com/news/indias-pli-scheme-for-acc-battery-storage-manufacturing-22349.html/>

manufacturing facility within two years.¹²⁷ All of this is intended to support domestic manufacturers in setting up production of globally competitive ACC batteries.¹²⁸

3.4.1 Key product: Electric Highways

The most common mitigation option identified by the Parties to the Paris Agreement when dealing with the transport category is the improvement of energy efficiency. As mentioned before, the top priority area within the transport category is road transport. Thus, the key product identified here is related to road transport rather than rail, maritime, or air transport.¹²⁹

As already explored, and as shown by the Indian policy example, one of the most straightforward approaches to improve energy efficiency is to resort to sources of clean energy to fuel vehicles of any kind. While opting for electric vehicles plays a huge role in substituting traditional fuels with electricity and is a good step towards greener transport, two important barriers limit the expansion of their purchase and use: the necessity of charging batteries and insufficient charging infrastructure on roadways.

It is exactly with the aim of addressing this gap that electric highways offer the most efficient path to decarbonize trucks and, therefore, freight transport.¹³⁰ This technology allows electricity to be taken straight from the grid and to directly charge a truck's engine and on-board batteries while the truck moves: moreover, it not only improves trucks' energy efficiency, but it also allows trucks to carry on more goods while being lighter. This is so because the space previously occupied by large, heavy batteries can be used to store goods.¹³¹ The E-highways provide continuous charging to power trucks.¹³²

The application of this technology requires significant intervention in the infrastructure field, but just a small percentage of roads would have to be electrified to have a significant impact on decarbonization of freight transport. This is so because heavy duty road freight is normally concentrated on main routes¹³³. Finally, the cost-efficiency associated with the implementation of this technology for the purpose

¹²⁷ N. Bhardwaj, "India's PLI scheme for ACC Battery storage manufacturing", 2021.
<https://www.india-briefing.com/news/indias-pli-scheme-for-acc-battery-storage-manufacturing-22349.html/>

¹²⁸ N. Bhardwaj, "India's PLI scheme for ACC Battery storage manufacturing", 2021.
<https://www.india-briefing.com/news/indias-pli-scheme-for-acc-battery-storage-manufacturing-22349.html/>

¹²⁹ UNFCCC Secretariat Synthesis Report, "Nationally Determined Contributions under the Paris Agreement", 2021.

¹³⁰ S. Amelang, "Electric Highways offer the most efficient path to decarbonise trucks", 2021.
<https://www.cleanenergywire.org/factsheets/electric-highways-offer-most-efficient-path-decarbonise-trucks>

¹³¹ S. Amelang, "Electric Highways offer the most efficient path to decarbonise trucks", 2021.
<https://www.cleanenergywire.org/factsheets/electric-highways-offer-most-efficient-path-decarbonise-trucks>

¹³² S. Amelang, "Electric Highways offer the most efficient path to decarbonise trucks", 2021.
<https://www.cleanenergywire.org/factsheets/electric-highways-offer-most-efficient-path-decarbonise-trucks>

¹³³ S. Amelang, "Electric Highways offer the most efficient path to decarbonise trucks", 2021.
<https://www.cleanenergywire.org/factsheets/electric-highways-offer-most-efficient-path-decarbonise-trucks>

of greenhouse gas emissions is supported by many relevant studies. The Cambridge University Centre for Sustainable Road Freight's examination of the issue is worth mention. It concludes that “overhead catenaries and compatible heavy goods vehicles are the most energy-efficient and cost-effective solution to fully decarbonize the road freight network.”¹³⁴

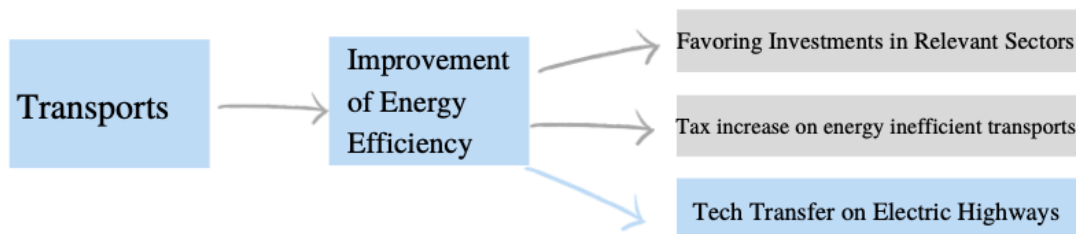
Unfortunately, the immense potential of Electric Highways can be undermined by two main obstacles: the required know-how to put in place such technology and the necessity of investments sustaining the building of infrastructure.

3.4.2 Tech Transfer and WTO compatibility

The relevance of the “know how” and technology innovation to implement more efficient policies in the transport sector is unprecedented and is recognized by many different countries, as shown in the Transport Initiative for Asia described above.¹³⁵ The international trade regime has a role to play in breaking down knowledge barriers between more developed, technically skilled countries and developing and least developed ones. It is for these reasons that incentivizing tech transfer is a prominent trade related measure for a smoother achievement of the goals related to the NDC category of transports.

Figure 6 shows the different trade related measures that governments can adopt to improve energy efficiency: in this case the primary measure would be the tech transfer on electric highways, while the remaining ones work as supportive mechanisms.

Figure 6: Transport and trade related measures



Tech transfer is key to spurring growth and development worldwide for a number of reasons. First is the worldwide shared goal of reducing greenhouse gas emissions. Second, it can improve international trade flows with relative costs reductions. If freight transport is made more efficient, faster, and cheaper thanks to Electric Highways, the benefit will be perceived by all the actors involved in the chain and a spillover effect could occur.

When dealing with technology transfer in the WTO framework, the TRIPS Agreement is relevant. Particularly informative on the developed-developing countries relation is Article 66.2 of the TRIPS, which provides a positive, legal obligation on the side of developed countries to “provide incentives to enterprises and

¹³⁴ S. Amelang, “*Electric Highways offer the most efficient path to decarbonise trucks*”, 2021. <https://www.cleanenergywire.org/factsheets/electric-highways-offer-most-efficient-path-decarbonise-trucks>

¹³⁵ International Transport Forum, “*NDC Transport Initiative for Asia*”, 2021.

institutions in their territories to promote and encourage technology transfer to least developed countries”. The importance of this commitment was reiterated on several occasions and refers to different domains in which tech transfer can apply. Examples are the Doha Declaration on the TRIPS Agreement and Public Health and the special export compulsory license decisions of 2003 and 2005.¹³⁶ Moreover, a mechanism monitoring the full implementation of developed countries obligations was established by the TRIPS Council in February 2003 with the aim of checking on the practical functioning of their incentives.¹³⁷

Despite the TRIPS Agreement coming into effect (including Article 66.2) in 1995, the provisions have not yet been fully implemented. An urgent call must be made to developed countries to act in a manner consistent with the obligations they undertook by ratifying the TRIPS Agreement and to adopt mechanisms that strengthen both technology transfer obligations of developed countries and LDC rights in the future.¹³⁸ The latter will be analyzed further in Chapter 4, dedicated to new practices promoting NDC goals.

Issues can also arise when countries make tech transfer a condition for something else. Technology-related host country measures can in fact have a huge impact on the pace and direction that technology transfer and dissemination have. Some examples come from the restriction on employment of foreign professionals and technical personnel, but also the imposition of requirements concerning the training of local personnel and transfer of technology/performance requirements.¹³⁹ An important case in this realm is for sure the 2018 EU action against China. According to the European Commission, the problem stands on “systemic practices that force European companies to give up sensitive technology and know-how as a precondition for doing business”.¹⁴⁰ This was stated due to the incompatibility of Chinese measures related to the protection of foreign companies’ intellectual property rights and multilateral rules. According to the EU, the imposition of performance requirements on EU companies “restrict their economic and contractual freedoms” on investments and technology transfer, while at the same times it forces or induces them to transfer technology to their joint ventures with Chinese partners. This appears to be a condition *sine qua non* to obtain administrative approvals for investments by Chinese authorities and is therefore perceived by the EU as a price to pay for investing in the country.¹⁴¹

¹³⁶ WTO Economic Research and Statistics Division, “*Least Developed Countries, Transfer of Technology and the TRIPS Agreement*”, 2018.

https://www.wto.org/english/res_e/reser_e/ersd201801_e.pdf

¹³⁷ WTO Economic Research and Statistics Division, “*Least Developed Countries, Transfer of Technology and the TRIPS Agreement*”, 2018.

https://www.wto.org/english/res_e/reser_e/ersd201801_e.pdf

¹³⁸ UNCTAD – ICTSD, “Does TRIPS Art. 66.2 Encourage Technology Transfer to LDCs? An analysis of Country Submissions to the TRIPS Council (1999 – 2007)”, 2008.

https://unctad.org/system/files/official-document/iprs_pb20092_en.pdf

¹³⁹ UNCTAD, “*Transfer of Technology*”, 2001. <https://unctad.org/system/files/official-document/psiteitd28.en.pdf>

¹⁴⁰ European Commission, “*EU steps up WTO action against China’s forced technology transfers*”, 2018. <https://trade.ec.europa.eu/doclib/press/index.cfm?id=1963>

¹⁴¹ European Commission, “*EU steps up WTO action against China’s forced technology transfers*”, 2018. <https://trade.ec.europa.eu/doclib/press/index.cfm?id=1963>

However, the dispute current status is still at the consultation stage and, therefore, a panel report has not been issued yet.¹⁴²

To conclude, for Governments to act in compliance with the obligations enshrined in Article 66.2, and more generally in the TRIPS Agreement, when dealing with tech transfer the following elements need to be present:

- Governments shall contribute to the promotion of technological innovation and tech transfer in least developed countries, following the rationale and goals of the TRIPS Agreement as listed in Article 7 of the Agreement itself;
- With particular reference to the case of electric highways, Governments shall incentivize domestic enterprises in the field to promote and encourage the spread of technology to LDCs, as envisioned in Article 66.2 TRIPS;

3.5 LULUCF

Forests, and the broader category of land use, are essential to meeting many states' NDC goals. 75% of NDCs mention LULUCF as a mitigation priority according to the UNFCCC Secretariat.¹⁴³ 55% of NDCs mention Forestry as a target sector. For example, Brazil's NDC states that it will restore 12 Mha (million hectares) of degraded forest by 2030 and eradicate illegal logging by the same year.¹⁴⁴ Furthermore, it makes the linkage between forests and agriculture with its commitment to strengthen its Low Carbon Emission Agriculture Program (ABC).

Deforestation and landscape degradation have recently gained political salience, as seen in the Glasgow Leaders' Declaration on Forests and Land Use.¹⁴⁵ 141 countries committed to strengthen efforts to conserve and restore forests, develop profitable and sustainable agriculture, and implement or redesign agricultural policies to incentivize sustainable agriculture and forest management. Moreover, the Declaration makes explicit mention of trade's role in accomplishing these goals, stating that these countries will, "facilitate trade and development policies, internationally and domestically, that promote sustainable development, and sustainable commodity production and consumption, that work to countries' mutual benefit, and that do not drive deforestation and land degradation".¹⁴⁶

Numerous developing countries demonstrate falling deforestation rates or have even turned the corner towards reforestation. However, studies demonstrate that these countries' gains are offset by displacement of deforestation to developing states.¹⁴⁷

¹⁴² WTO – Dispute Settlement, *DS549: China- Certain Measures on the transfer of technology*, 2018. https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds549_e.htm

¹⁴³ UNFCCC Secretariat, "Nationally determined contributions under the Paris Agreement," 2021

¹⁴⁴ Federative Republic of Brazil, First NDC, 2016. P.3.

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Brazil%20First/BRAZIL%20iNDC%20english%20FINAL.pdf>

¹⁴⁵ "Glasgow Leaders' Declaration on Forests and Land Use," UN Climate Change Conference (COP26) at the SEC – Glasgow 2021, November 2, 2021, <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.

¹⁴⁶ "Glasgow Leaders' Declaration on Forests and Land Use," UN Climate Change Conference (COP26) at the SEC – Glasgow 2021, November 2, 2021, <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.

¹⁴⁷ Pendrill, et al., "Agricultural and forestry trade drives large share of tropical deforestation emissions," 2019.

This displacement tends to shift deforestation to tropical countries that are home to ecologically sensitive biomes.¹⁴⁸

The emphasis on the nexus of trade, agriculture, and deforestation is well placed. Land use contributes approximately 10% of global CO₂ emissions and nearly a quarter of CH₄ and N₂O emissions.¹⁴⁹ Furthermore, agriculture is the primary driver of deforestation. While measures differ, roughly 70% of tropical deforestation is linked to agriculture.¹⁵⁰ There are a number of regions of interest for LULUCF emissions mitigation. Foremost among these is Latin America, as it is home to numerous biomes threatened by agriculture-driven deforestation.¹⁵¹ Moreover, Latin American states like Brazil and Argentina are key producers of export-linked agriculture commodities, demonstrating the deforestation displacement process.

3.5.1 Key Product: Soybeans

The products driving this process are cattle, oilseeds like soybeans and palm oil, and timber products. Among these, soybeans and palm oil have perhaps the clearest connection to international trade. Indeed, few commodities are more integrated into global trade networks than oilseeds. There are a number of reasons for this. Cattle production, while clearly a driver of deforestation and a source of emissions, tends to primarily serve domestic demand.¹⁵² For example, Brazil produced 15% of world beef supply by 2013.¹⁵³ However, it only exports 11-21% of the emissions from this production.¹⁵⁴ On the other hand, products like soybeans are predominantly cultivated for export. Moreover, growers and consumer tend to be separate but concentrated. The US, Brazil, and Argentina produce 80% of the world's soybean crops, while China and the EU-28 account for 40% of consumption.¹⁵⁵

Figure 7 shows the different trade related measures that governments can adopt to improve afforestation, reforestation and revegetation: in this case the primary measure would be the purchase moratorium on soybeans grown on newly deforested land, while the remaining ones stand as supportive mechanisms.

Figure 7: LULUCF and trade related measures

¹⁴⁸ Abman and Lundberg, "Does Free Trade Increase Deforestation? The Effects of Regional Trade Agreements," 2020. P. 36.

¹⁴⁹ Grassi, Giacomo, et al., "The Key Role of forests in meeting climate targets requires science for credible mitigation," 2019. P. 220.

¹⁵⁰ Tropical Forest Alliance and World Economic Forum, "The Roadmap to Financing Deforestation-Free Commodities, World Economic Forum", (2018) P. 5.
<https://www.tropicalforestalliance.org/assets/Uploads/The-Roadmap-to-Financing-Deforestation-Free-Commodities.pdf>

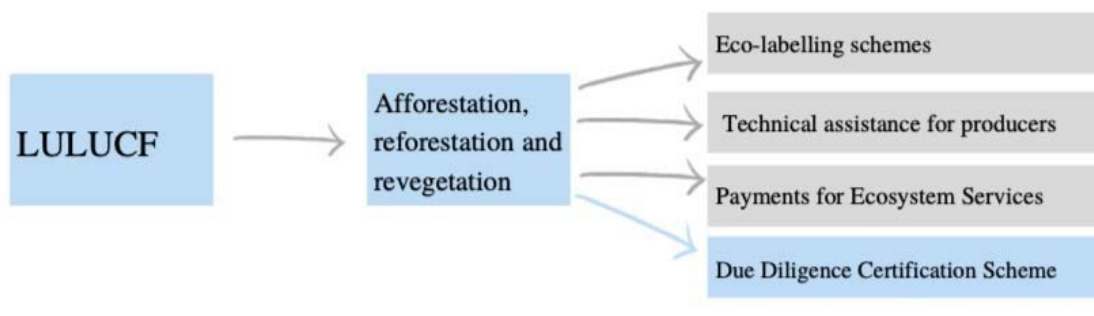
¹⁵¹ WWF, "The Growth of Soy: Impacts and Solutions," 2014.

¹⁵² Pendrill, F., et al., "Agricultural and forestry trade drives large share of tropical deforestation emissions," 2019. PP. 5-6.

¹⁵³ Stabile, M. et al., "Solving Brazil's land use puzzle: Increasing production and slowing Amazon deforestation," 2020. P. 2.

¹⁵⁴ Pendrill, F., et al., "Agricultural and forestry trade drives large share of tropical deforestation emissions," 2019. PP. 5-6.

¹⁵⁵ Chalmin, Philippe and Jegourel, Yves. 2020. *Cyclops Report: World Commodities Markets*, Cercle Cyclope. P. 240.



3.5.2 Supply chain due diligence scheme and WTO Compliance

Current measures such as voluntary labelling schemes are insufficient to address agriculture driven deforestation and degradation.¹⁵⁶ This study proposes that importing states implement mandatory supply chain due diligence and certification schemes for soybeans and soybean-containing products. The goal of the proposed measure is reducing indirect land use change (ILUC) generated by demand from import markets like the EU and China. This, in turn, would reduce GHG emissions and biodiversity loss.

The measure in question is based on a regulation proposed by the European Commission.¹⁵⁷ The EU's proposed measure creates a country benchmarking system wherein exporting countries are classified as being at low, standard, or high risk of deforestation. The criteria for classification include: the national rate of deforestation or degradation; the rate of expansion of agricultural land used for producing forest risk commodities; production trends of relevant commodities; the presence of land use change commitments within the country's NDC; and the presence, application, and effectiveness of national and subnational laws prohibiting and sanctioning deforestation.¹⁵⁸ The definition of deforestation is based on that provided by the FAO.¹⁵⁹

All countries seeking access to the European market must provide evidence that due diligence procedures have been carried out prior to importation.¹⁶⁰ This includes the requirement to collect the geographic coordinates of all plots on which relevant commodities were produced.¹⁶¹ This is done so as to be able to verify, likely through satellite imagery, that the product in question was not produced on deforested land.

¹⁵⁶ Blackman, A., Goff, L., Planter, M.R., "Does eco-certification stem tropical deforestation? Forest Stewardship Council Certification in Mexico", 2018. P. 306.

¹⁵⁷ European Commission, Proposal for a Regulation of the European Parliament and of the Council on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010. COM 2021 (706) final. https://ec.europa.eu/environment/publications/proposal-regulation-deforestation-free-products_en.

¹⁵⁸ Ibid. Article 27.

¹⁵⁹ "Deforestation is the conversion of forested areas to non-forest land use such as arable land, urban use, logged area or wasteland... deforestation is the conversion of forest to another land use or the long-term reduction of tree canopy cover below the 10% threshold." FAO, "Manual on deforestation, degradation, and fragmentation using remote sensing and GIS", 2007. P.5. <https://www.fao.org/forestry/18222-045c26b711a976bb9d0d17386ee8f0e37.pdf>.

¹⁶⁰ Ibid. Article 8.

¹⁶¹ Ibid. Article 9.

Operators in low-risk countries are exempt from the requirement to conduct a risk assessment, and in the event considerable risk of deforestation is found, to take mitigation actions until the risk is negligible.

The EU's proposed measure has the potential for significant environmental benefits. Impact assessments suggest the measure could reduce the effect of EU demand on 71,920 hectares of land, cut carbon emissions by 31.9 million metric tons, and make significant contributions to biodiversity preservation.¹⁶²

That said, there are risks associated with the measure, including the transition of demand away from smallholders in high-risk countries to low risk producers. While the deforestation cut-off date set in 2020 is intended to minimize this risk, implementing countries ought to consider supportive policies to offset potential negative effects.

While the measure proposed here strictly addresses soybeans, the EU's proposal addresses a number of forest risk commodities. States implementing similar regulations could therefore shape them to the local economic and environmental context, to include products like oil-palm. This study does not suggest direct mimicry of the EU's proposal but using it as a blueprint that can be adapted to local contexts.

The measure in question would have to be consistent with the most favored nation and national treatment obligations of GATT Articles I and III, with potential justification for inconsistencies under Article XX. If the measure is considered a product-related process and production method (PR PPM), it would be a technical regulation subject to the provisions under the TBT. This study will therefore examine the measure's consistency with the GATT before turning to the TBT's relevant provisions, namely Articles 2.1 and 2.2.

GATT III:4 lays out the national treatment obligation such that any internal regulation must treat imported products no less favorably than like domestic products. This means that to be consistent with GATT Article III:4, a regulation that treats products differently depending on their deforestation footprint must be applied with respect to products that are considered non-like. Likeness is determined by analyzing four criteria: 1) physical properties; 2) end uses; 3) consumer preferences; 4) tariff (HS) classification.¹⁶³ For soybeans, physical properties, end-uses, and tariff classification will all be the same. The question, then, is the extent to which consumers indicate different preferences for deforestation-free soybeans and whether this would suffice to render the products non-like. If the products are considered to be like, the next step would be to find discriminatory treatment, which focuses on equality of competitive opportunities for both groups of products.¹⁶⁴ If this is present and if the product is

¹⁶² European Commission. 2021. Executive Summary of the Impact Assessment Report: minimizing the risks of deforestation and forest degradation associated with products placed on the EU market. SWD(2021) 327 final. P. 2. https://ec.europa.eu/environment/system/files/2021-11/SWD_2021_327_1_EN_resume_impact_assessment_part1_v2.pdf.

¹⁶³ Appellate Body Report, *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products*, WT/DS135/AB/R, adopted 15 March, 2001. Para. 101.

¹⁶⁴ Appellate Body Report, *European Communities—Measures Prohibiting the Importation and Marketing of Seal Products*, WT/DS400/AB/R, WT/DS401/AB/R, adopted June 18, 2014. Para. 5.101.

found to be “like”, the proposed measure could be found to violate GATT III:4’s national treatment obligation.¹⁶⁵

GATT Article I:1 sets out the fundamental principle of most favored nation treatment. It stipulates that any advantage conferred to the products of one Member must be conferred on the like products of all other Members without condition or delay. Given that the proposed measure would grant preferential access based on specific criteria, it grants an advantage. The GATT III:4 analysis above establishes that there is the potential the products in question could be found like. The Appellate Body found in *EC— Seal Products*¹⁶⁶ that Members can draw regulatory distinctions between like imported products if there is no detrimental effect on imported goods’ competitive opportunities. Furthermore, the Appellate Body’s findings in *Canada—Automobiles* indicates that truly origin neutral PPM criteria could be compliant with GATT I:1.¹⁶⁷ Therefore, the critical questions are whether the criteria used are truly origin neutral and if the measure has detrimental effects on imports’ conditions of competition.

The measure proposed by the EU creates multiple classifications of exporting countries or parts thereof based on their proven level of risk.¹⁶⁸ Depending on implementation, this classification could create grounds for challenge under GATT I:1, by calling into question whether it constitutes an origin specific determination. To ensure GATT I:1 consistency, less favorable treatment would have to be limited to products from specific areas within countries that demonstrate high rates of deforestation.¹⁶⁹ That said, there could be grounds for MFN violations where most products from Country A do not qualify under the criteria, while most from Country B do.¹⁷⁰

Where violations of GATT I and III are found, a Member can attempt to justify their measures under the exceptions found in Article XX. In order to be found justifiable under Article XX, the Member must demonstrate that the measure in question is either “necessary to protect human, animal, or plant health and life” (Article XX (b); or “related to the preservation of exhaustible natural resources, conditional upon similar restrictions upon domestic production” (Article XX (g)).

While Article XX(b) is relevant, particularly for biodiversity concerns, this study will analyze the proposed measure under XX(g), as it presents the best opportunity for justification. That said, arguments could be made under both. XX(g) requires the measure in question to be ‘related to’ the preservation of exhaustible natural resources. This presents a somewhat less demanding test than the necessity requirement established within other sub-paragraphs. The Appellate Body confirmed in *US—Gasoline* that ‘related to’ can be interpreted as ‘primarily aimed at’ the pursuit

¹⁶⁵ Partiti, Enrico. 2020. "Regulating trade in forest-risk commodities." P. 42.

¹⁶⁶ Appellate Body Report, *European Communities—Measures Prohibiting the Importation and Marketing of Seal Products*, WT/DS400/AB/R, WT/DS401/AB/R, adopted June 18, 2014. Para. 5.88.

¹⁶⁷ Charnovitz, Steve. 2002. "The law of environmental PPMs in the WTO: debunking the myth of illegality." P. 85.

¹⁶⁸ European Commission, Proposal for a Regulation of the European Parliament and of the Council on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010. COM 2021 (706) final. Article 27. https://ec.europa.eu/environment/publications/proposal-regulation-deforestation-free-products_en.

¹⁶⁹ Partiti, Enrico. 2020. "Regulating trade in forest-risk commodities." P. 43.

¹⁷⁰ Ibid. P. 44.

of the goal in question.¹⁷¹ Initial impact analyses do indicate that the measure would have a positive effect on ILUC and would therefore appear to fulfil this requirement. This is, however, not certain.

Second, the measure in question must be made effective in conjunction with restrictions on domestic production or consumption. This requirement could create issues relating to likeness and substitutable products. If a panel found that the imported products in question were restricted, while substitutable domestic products were not subject to any restrictions at all, there could be grounds to argue the measure does not fulfill this obligation. For example, if imported soybeans were restricted, while domestically produced rapeseed were not subject to any restrictions, the requirement for evenhandedness under XX(g) will not have been met. This is contingent on said products being found like, the prospects of which are unclear at present. *EU—Palm Oil*, currently pending a Panel decision, addresses related issues and could provide further clarity.¹⁷²

The case law remains ambiguous regarding the regulation of the global commons. *US—Shrimp* appeared to leave the door open to extraterritorial regulation.¹⁷³ Furthermore, the Appellate Body found in *US—Gasoline* that clean air is considered an exhaustible natural resource.¹⁷⁴ Hence, arguing the measure in question protects the supply of clean air within and beyond the regulating Member is a potentially viable avenue for justification under XX(g).

The measure must also be found compliant with the provisions of Article XX's Chapeau. The Chapeau essentially dictates that measures shall not arbitrarily or unjustifiably discriminate between countries, nor act as a disguised restriction on trade. The key question is whether the discrimination bears a rational relationship to the objective of the measure in question. Measures have been found to be unjustifiably discriminatory when they were deemed to have insufficient nexus with the avowed goal.¹⁷⁵ If the EU's designation of high, standard and low risk deforestation areas is considered to reflect arbitrariness, the measure would not be compliant with the Chapeau of Article XX. Measures may also violate the Chapeau's provisions when they do not take into consideration alternative national arrangements that target the same goal, as was the case in *US—Shrimp*. Flexibility and dialogue between regulating Members and producer are therefore critical. As was the case in *US—Shrimp*, recognizing an alternative national arrangement, such as the certification process, should be allowed and the process must be done in a transparent manner. Lastly, measures must not discriminate between similarly situated Members. This means that high, standard, and low risk designations must be applied based on the same objective criteria applied similarly to all countries.

The proposed measure establishes requirements for production and processing methods (PPMs) but does not directly impact the physical characteristics of the

¹⁷¹ Appellate Body Report, *United States—Standards for Reformulated and Conventional Gasoline*, WT/DS2/AB/R, adopted 20 May 1996.

¹⁷³ Appellate Body Report, *United States—Import of Certain Shrimp and Shrimp Products*, WT/DS59/AB/R, adopted 6 November 1998.

¹⁷³ Appellate Body Report, *United States—Import of Certain Shrimp and Shrimp Products*, WT/DS59/AB/R, adopted 6 November 1998.

¹⁷⁴ Partiti, Enrico. 2020. "Regulating trade in forest-risk commodities." P. 47.

¹⁷⁵ *Ibid.*

product in question. The measure in question can be classified as a non-product related process and production method (NPR PPM) requirement and, even if it is still an open question, may relate to the TBT Agreement as a technical regulation. Specifically, the Appellate Body found in *EC—Seals* that a PPM must demonstrate sufficient nexus to product’s physical characteristics to be covered by TBT Annex 1’s definition of a technical regulation. The ongoing dispute settlement case, *EU—Palm Oil*, addresses measures similar to those presented here. This case could clarify how an (NPR) PPM must be designed and implemented in order to be WTO compliant.

Pending the *EU—Palm Oil* dispute, a PPM that does not leave any physical trace in the final product is unlikely to fall under the TBT Agreement. However, depending on the structure, design, and implementation of the PPM, some variances could lead to be considered as a technical regulation, thus falling under the purview of the TBT

Indeed, if the measure were linked to a labelling requirement, it would likely fall under the purview of the TBT.¹⁷⁶ Indeed, the definition of technical regulation in the TBT Agreement covers documents that “include or deal exclusively with terminology, symbols, packaging, marking or *labelling requirements* as they apply to a product, process or production method (emphasis added).”¹⁷⁷ As such, to concluded whether the measure falls under the TBT Agreement is highly contextual, requiring specific facts on a case-by-case basis.

Assuming the measure is found to be a technical regulation, according to TBT Article 2.1, it must conform to most favored nation and national treatment requirements. Three-point tests can be used to determine whether a measure is compliant with these requirements.¹⁷⁸ In order to fulfill the MFN requirement, the measure in question must: (1) be a technical regulation; (2) the products at issue must be like; (3) “the treatment accorded to imported goods from any member must be no less favorable than that accorded to like products originating in any other country.”¹⁷⁹ The national treatment obligation follows a similar test, albeit with the third point being the treatment of imported goods must be no less favorable than that granted to like domestic ones.

The Appellate Body established in *US—Clove Cigarettes* that the GATT III:4 process outlined above should be used as the basis for determining likeness under the TBT.¹⁸⁰ For the sake of analysis one can assume here that the products may be found like. In effect, any detrimental impact must stem exclusively from legitimate regulatory distinctions. That said, there remains scope for the measure to fulfil the MFN and national treatment obligations by being designed and applied in a truly origin neutral fashion. The proposed measure’s classification of producers would need be based on objective criteria and capable of differentiating between areas within a country.

¹⁷⁶ Appellate Body Report, *United States—Measures Concerning the Importation, Marketing, and Sale of Tuna and Tuna Products*, WT/DS381/AB/R, adopted June 13 2012.

¹⁷⁷ See Annex 1:1 of the TBT Agreement

¹⁷⁸ Sifonios, D., *Environmental Process and Production Methods (PPMS) in WTO Law*,” 2018. P. 255.

¹⁷⁹ Maggio, A.R., “*Environmental Policy, non-product related process and production methods and the Law of the World Trade Organization*,” Vol.1 2017. P. 173.

¹⁸⁰ Maggio, A.R., “*Environmental Policy, non-product related process and production methods and the Law of the World Trade Organization*,” Vol.1 2017. P. 178.; Appellate Body Report, *United States—Measures Affecting the Production and Sale of Clove Cigarettes*, WT/DS406/AB/R, adopted 24 April 2012.

Furthermore, it would need to be applied to like domestic products in an even-handed manner.¹⁸¹

Furthermore, Article 2.2 TBT sets out the requirements that the measure in question not be more trade restrictive than necessary to fulfil a listed legitimate objective. These include the protection of human, animal, and plant health, and the protection of the environment. It can be argued the measure pursues both. The Appellate Body has established that the question of whether a measure fulfills an objective is based on the measure's degree of contribution, as determined by its design, application, and actual impact.¹⁸²

US—Tuna II established the procedure by which panels should examine measures under this obligation. Panel members must balance the degree of contribution to the legitimate objective, the nature of the risks at issue, and the consequences of non-fulfillment against the measure's trade restrictiveness. In order to determine whether a measure is more trade restrictive than necessary, Panels normally consider the measure's effectiveness and restrictiveness relative to alternative measures.¹⁸³ These measures must be readily available and less trade restrictive, while taking into account.¹⁸⁴

The measure in question provides a relatively high level of protection for objectives of critical importance. Furthermore, the relevant product sectors are complex, making the design of alternative measures that meet the above requirements a challenge.¹⁸⁵

In sum, various WTO provisions are relevant when adopting measures that treat products differently based on their associated deforestation risk. While the jurisprudence with respect to PPMs remains unclear, for the measure to be WTO consistent, it would, at minimum have to be designed in accordance with core WTO principles such as non-discrimination.

4 Proposals to enhance alignment between the WTO and NDCs

Chapter 3 has presented and analyzed how existing trade agreements can be leveraged to help countries achieve their NDC goals. Despite the intrinsic potential these multilateral agreements have, as shown by the variety and strengths of the proposed measures, it is possible to argue that there remain avenues for further improvement. The purpose of this chapter is to shed light on how the link between NDCs and the WTO can be improved. The first part of this Chapter examines options for countries that can be adopted unilaterally within the existing trade regime. These include (i) the implementation of Article 66.2 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (the TRIPS Agreement), (ii) the ratification of the plurilateral Agreement on Government Procurement (GPA), and the (iii) transformation of the NDCs into a law at the domestic level.

¹⁸¹ Appellate Body Report, *United States—Measures Affecting the Production and Sale of Clove Cigarettes*, WT/DS406/AB/R, adopted 24 April 2012. Para. 215.

¹⁸² Appellate Body Report, *United States—Measures Concerning the Importation, Marketing, and Sale of Tuna and Tuna Products*, WT/DS381/AB/R, adopted June 13 2012. Para. 315-317.

¹⁸³ Appellate Body Report, *United States—Measures Concerning the Importation, Marketing, and Sale of Tuna and Tuna Products*, WT/DS381/AB/R, adopted June 13 2012. Para. 318.

¹⁸⁴ Maggio, A.R., "Environmental Policy, non-product related process and production methods and the Law of the World Trade Organization," Vol.1 2017. P. 180.

¹⁸⁵ Partiti, Enrico. 2020. "Regulating trade in forest-risk commodities." P. 47.

The report then turns to new practices at the systemic level that would require amendments to the rules set out in the WTO agreements. Specifically, it examines the possibility of a climate change waiver of WTO obligations and related proposals that could enhance states' ability to fulfil their goals under the Paris Agreement, thereby creating a comprehensive and stable link between the trade and climate regime frameworks.

4.1 Implementation of Article 66.2 of the TRIPS Agreement

Transfer of technology is key in the fight against climate change as not all countries have at their disposal the same means to reduce greenhouse emissions. Technology inequity has existed for many years because of the economic disparities between developed, developing countries and least developed countries (LDC). The Glasgow Climate Pact calls upon Parties “to accelerate the development, deployment and dissemination of technologies, and the adoption of policies, to transition towards low-emission energy, including by rapidly scaling up the deployment of clean power generation and energy efficiency measures”. According to Article 10 of the Paris Agreement, Parties “shall strengthen cooperative action on technology development and transfer”. In principle, a technology mechanism is foreseen in the Treaty to contribute to the technology development and dissemination efforts benefiting developing country Parties.

However, the challenge of developing green or environmentally sound technologies requires a specific legal framework that falls beyond the scope of the Paris Agreement. Under WTO law, developed countries have the legal obligation to provide incentives to enterprises and institutions in their territories to promote technology transfer to least-developed countries. Article 7 of the TRIPS Agreement indicates that the protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge. It should be conducted in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

TRIPS and the provisions within Article 66.2 were established in 1994, but the provisions have not yet been fully implemented. On 20 February 2003 the TRIPS Council adopted¹⁸⁶ a transparency mechanism that requires developed country members to submit every three years a report on how the incentives function in practice and to update of these reports in the intervening years. The issue has barely been addressed in TRIPS Council meetings. Only between 2013 and 2014 was the topic included in the agenda when Ecuador¹⁸⁷ initiated a debate in a submission to the TRIPS Council entitled “Contribution of intellectual property to facilitating the transfer of environmentally rational technology”.

The WTO Secretariat could support the transfer of green technology from developed countries to least-developed countries by analyzing key technologies that have proven to be effective in the fight against climate change, especially those that would serve members to achieve their NDCs. It could then produce a comprehensive list of

¹⁸⁶ WTO Document (IP/C/28, 20 February 2003). Available here: <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/28.pdf&Open=True>

¹⁸⁷ WTO Document (IP/C/W/585, 5 March 2013). Available here: <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W585.pdf&Open=True>

technologies that LDCs should have access to in order to fight climate change and reduce greenhouse gas emissions. In addition to this, the WTO Secretariat should encourage Members to facilitate the technology transfer of those included in its assessment.

4.2 Acceding to the GPA

On average, governments spend 45 to 65% of their budgets on procurement, amounting to 13 to 17% of gross domestic product in OECD countries.¹⁸⁸ Green public procurement is an important tool that could contribute by offering a legal alternative to subsidies to foster environmentally friendly activities ranging from the energy sector to improving recycling services of waste. These types of initiatives would require an initial boost from the public sector as the private sector would not have the proper incentives or initiative to carry it out on their own. Therefore, public procurement is called to play an important role in spurring innovation through raising the demand of a certain product or service and by making economically sustainable some measures to fight climate change.

At present, the GPA has currently been adopted by only 21 parties comprising 48 WTO Members. Hence, this report proposes that the additional measure of encouraging more States to ratify the GPA to expand the legal tools available to promote environmental measures that are also WTO compatible while making the procurement environment more predictable. Accession to the GPA would require negotiations between the acceding country and the current parties to the GPA to agree the procuring entities and goods and services sectors applicable, as well as to determine that the acceding member's procurement legislation is consistent with the GPA. After several rounds of negotiations, the GPA parties have opened procurement activities estimated to be worth more than US\$ 1.7 trillion annually to international competition. The first version of the GPA resulted after the 7th GATT Round in Tokyo in 1979.

Although governments are free to open their procurement markets to foreign suppliers absent being a signatory to the GPA, the GPA has proven to provide additional incentives to do so. In this sense, recent empirical analysis¹⁸⁹ has shown that the GPA significantly increases the probability that a foreign firm will win procurement contracts, which promotes a competitive environment by increasing the number of offers and lowers the probability that the procurement price is higher than that estimated by the procuring authority. Furthermore, the GPA lowers corruption risk by decreasing the number of contracts with a single bidder, which ultimately decreases overall costs associated with public procurement.

Moreover, while the original GPA entered into force in 1981 (before the Uruguay Round), a Protocol to the agreement was adopted in 2012, which introduced environmental criteria into the public procurement process. This resulted in an increase of green public procurement measures. For example, Article X:6 GPA states that technical specifications may be used "to promote the conservation of natural

¹⁸⁸ "Trade and Green Economy. A Handbook." (International Institute for Sustainable Development (IISD) and United Nations Environment Programme (UNEP), 2014), 109, <https://www.iisd.org/publications/trade-and-green-economy-handbook-third-edition>.

¹⁸⁹ Bedri Kamil Onur Taş et al., "Does the WTO Government Procurement Agreement Deliver What It Promises?," *World Trade Review* 18, no. 4 (October 2019): 633.

resources or protect the environment”. Thereby, this provision can be interpreted broadly to encompass any specification that has a beneficial effect on natural resources or on the environment¹⁹⁰ and therefore, allows under certain circumstances the creation of eco-labels. Thus, increasing the number of WTO compatible measures that States could implement to comply with the overall objective set in the Paris Agreement.

Beyond the ratification of the GPA by an increased number of WTO Members, the WTO Secretariat could launch a webpage called WTO Green Procurement, to raise awareness of public bids with environmental purposes among the GPA Parties. Similar initiatives have been introduced successfully in other organizations, for example WIPO Green, an online platform that connects providers and seekers of environmentally friendly technologies.¹⁹¹ This initiative by the WTO Secretariat could facilitate green public procurement projects as it would allow more foreign companies to participate in these public tenders that in other circumstances might go unnoticed. The initiative could also lead to increase the cooperation with financial private institutions and multilateral development banks that could help to match financial resources with specific projects either in developing or LDC countries or based on the project’s overall importance. This online database could catalyze green government procurement and ultimately offer additional encouragement to other WTO Members to access to the GPA to benefit from this service.

4.3 Transformation of NDCs into national law

Unlike the Paris Agreement, NDCs are not legally binding and remain in some cases only an aspirational document. Yet compliance with the objective to hold the global temperature increase to well below 2 °C above pre-industrial levels is closely linked to the fulfilment of the measures and greenhouse emission targets set in the NDCs. Like many environmental treaties, Paris Agreement does not establish an enforcement mechanism that obliges States to comply with their commitments. Instead, Article 15 provides for the establishment of a non-compliance mechanism managed by a committee of twelve experts elected by the Conference of the Parties, but whose role is limited to facilitating compliance instead of enforcing it. Consequently, if Parties of the Paris Agreement are serious about combatting climate change, an option to ensure compliance is to transform some NDC targets into law with two objectives in mind.

Firstly, the transformation of the NDC into law would change its soft law character to a legally binding commitment by public authorities. Hence, citizens could demand its fulfillment before domestic courts. Once transformed into national law, the domestic courts of a state could enforce the commitments, targets and projects included in the NDC. This formula has been successful in countries like France,¹⁹² Germany¹⁹³ and the Netherlands¹⁹⁴ where national courts have interpreted that the greenhouse gas emissions targets established by the government in national laws were insufficient to meet the objectives of the Paris Agreement. As a result, governments were required to

¹⁹⁰ Rika Koch, *Green Public Procurement under WTO Law. Experience of the EU and Prospects for Switzerland.*, vol. 9, EYIEL Monographs - Studies in European and International Economic Law (Springer, 2019), 105.

¹⁹¹ See WIPO Green, <https://www3.wipo.int/wipogreen/en/>

¹⁹² Commune de Grande-Synthe et autre., No. 427301 (Conseil d’État (France) November 19, 2020).

¹⁹³ Order of the First Senate, No. 2656/18 (German Federal Constitutional Court March 24, 2021).

¹⁹⁴ Urgenda, ECLI:NL:HR:2019:2007 (Hoge Raad (Supreme Court of the Netherlands) 2019).

increase the level of ambition of national targets, which ultimately contributed to increased overall compliance with the Paris Agreement.

Secondly, the transformation of NDCs into law could have an impact on trade disputes. Potential conflict between multilateral environmental agreements and WTO law is conditional upon certain provisions in the former could potentially violate obligations enshrined in the latter.¹⁹⁵ Addressing this potential source of disharmony is important to increase the cooperation between the trade and environment regimes and to enhance the WTO framework's potential for positive contribution.

Indeed, Article XX (d) of the GATT indicates that WTO Members have the right to justify inconsistent measures taken to ensure compliance with laws or regulations which are not inconsistent with the provisions of the GATT. In the case *India— Solar Cells*, a renewable energy support scheme that contained local content requirements was found to breach the national treatment clause set out in GATT Article III:4 and TRIMS Article 2.1. India claimed the measure was justified under Article XX (d) of the GATT as the renewable energy support scheme was implemented to ensure compliance with its international climate change obligations contained by 4 international institutions, including the UNFCCC. However, both the Panel and the Appellate Body¹⁹⁶ considered the degree of normativity of these international obligations was insufficient to qualify them as “laws or regulations” under Article XX(d). The Appellate Body identified¹⁹⁷ the criteria to assess the degree of normativity of a law or a regulation:

- “(i) the degree of normativity of the instrument and the extent to which the instrument operates to set out a rule of conduct or course of action that is to be observed within the domestic legal system of a Member;
- (ii) the degree of specificity of the relevant rule;
- (iii) whether the rule is legally enforceable, including, e.g. before a court of law;
- (iv) whether the rule has been adopted or recognized by a competent authority possessing the necessary powers under the domestic legal system of a Member;
- (v) the form and title given to any instrument or instruments containing the rule under the domestic legal system of a Member; and
- (vi) the penalties or sanctions that may accompany the relevant rule”.

Based on the above, NDCs or related targets should be transformed into national law to enable WTO Members to invoke Article XX(d) GATT in future trade disputes, provided that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries or a disguised restriction on international trade.

In this sense, the European example could be followed by others. At the EU level Article 2 of the European Climate Law¹⁹⁸ has set the objective of climate neutrality

¹⁹⁵ D. J. Caldwell, “*Multilateral Environmental Agreements and the GATT/WTO regime*”, 1998.

https://www.iatp.org/sites/default/files/Multilateral_Environmental_Agreements_and_the_.pdf

¹⁹⁶ India — Certain Measures Relating to Solar Cells and Solar Modules., No. WT/DS456/AB/R (Report of the Appellate Body September 16, 2016).

¹⁹⁷ India — Certain Measures Relating to Solar Cells and Solar Modules. paragraph 5.113.

¹⁹⁸ “Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 Establishing the Framework for Achieving Climate Neutrality and Amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (‘European Climate Law’),” 243 OJ L § (2021), <http://data.europa.eu/eli/reg/2021/1119/oj/eng>.

and states that “Union-wide greenhouse gas emissions and removals regulated in Union law shall be balanced within the Union at the latest by 2050, thus reducing emissions to net zero by that date (..) the relevant Union institutions and the Member States shall take the necessary measures at Union and national level, respectively, to enable the collective achievement of the climate neutrality objective”. It creates a legally binding commitment enforceable before both EU and national courts. Hereafter, each Member State of the EU must implement specific measures to achieve the overall objectives set in the EU’s NDC. For example, the Spanish law on climate change and energy transition¹⁹⁹ includes specific measures to meet the climate neutrality objectives set at EU level such as: the country’s commitment to cut emissions 23% by 2030, the ban to sale fossil fuel vehicles by 2040 and the goal to generate 74% of the country’s electricity with renewable sources by 2030. These obligations have been assumed to comply with the Paris Agreement, but unlike NDCs they have a legally binding nature.

4.4 Environmental Interpretation by the WTO Ministerial Conference or climate waiver of WTO obligations

The previous sections analyzed how WTO Agreements can be leveraged to promote the achievement of NDCs. The purpose was to show the potential that the international trade regime already has, without requiring any further negotiation among Members. The posited measures can facilitate the achievement of NDCs and stand as concrete examples of beneficial overlap within the trade-environment nexus. That said, the international trade regime’s supportive role can be enhanced through reform.

James Bacchus makes an important call to this point. The regulatory frameworks of the focal trade and climate change institutions, the WTO and the COP of the UNFCCC respectively, are colliding. Hence, he argues there is an urgent need to negotiate a “climate waiver from WTO obligations for all trade-restrictive climate response measures that are taken to comply with the Paris Agreement and the UNFCCC”.²⁰⁰ The main argument sustaining this thesis is the fact that neither of the two regimes are sufficiently developed to address the reality that many national measures necessary to address climate change issues will inevitably have trade restrictive or distortive effects and will therefore not comply with extant WTO law. Such conflict weakens the potential to achieve the mitigation goals within the Paris Agreement.²⁰¹

Is a climate waiver possible under the WTO framework or is it a utopic idea? The relevant provisions establishing the procedural requirements for a climate waiver are here presented:

- The WTO waiving power is set out in Article IX:3 of the WTO Agreement which allows the WTO Ministerial Conference “in exceptional circumstances

¹⁹⁹ Available here (Spanish) https://www.boe.es/diario_boe/txt.php?id=BOE-A-2021-8447

²⁰⁰ J. Bacchus, “*The case for a WTO Climate Waiver*”, 2017. <https://www.cigionline.org/sites/default/files/documents/NEWEST%20Climate%20Waiver%20-%20Bacchus.pdf>

²⁰¹ J. Bacchus, “*The case for a WTO Climate Waiver*”, 2017. <https://www.cigionline.org/sites/default/files/documents/NEWEST%20Climate%20Waiver%20-%20Bacchus.pdf>

to waive an obligation imposed on a Member by this Agreement or of any of the Ministerial Trade Agreements, provided that decision shall be taken by three-fourths of the Members”,²⁰²

- Article IX:4 of the WTO Agreement limits the conditions in which a waiver can be granted to exceptional circumstances and subjects it to a justification of the decision and the terms and the conditions of the waiver by the Ministerial Conference.²⁰³ A particular problem is that no definition of what constitutes an exceptional circumstance is provided.²⁰⁴
- Particularly relevant is the Understanding in Respect of Waivers of Obligations under the GATT 1994. Paragraph 1 mentions the fact that a waiver request should describe the measures that are going to be taken and the specific policy objectives they are aimed at. Moreover, an explanation of why existing WTO consistent measures do not fit the objectives is required.²⁰⁵

While surely animated by a well-intended rationale, the climate waiver proposal needs to be analyzed in terms of its feasibility. As an important legal instrument, the waiver would require important steps by WTO Members. In fact, the procedural requirements are necessary for its adoption are demanding. Among them, the above mentioned $\frac{3}{4}$ support requirement would be particularly hard to meet especially considering the current political climate at the WTO. Despite the WTO’s efforts to align environmental goals with trade priorities, cooperation between international climate policy actors in these fields is limited and has stalled.²⁰⁶ Agreeing on such a measure and ensuring that developing countries do not feel unfairly burdened is a challenge the current trade. The current environment policy architecture seems to be ill-equipped to deal with disputes that might arise following the adoption of a permanent waiver.²⁰⁷

5 Conclusion

This report has identified and analyzed a set of trade measures that countries can adopt to implement most commonly adopted NDC For each of these measures, this report has analyzed the extent to which the WTO enables countries to adopt these measures. These analyses have been rather broad, given the difficulty of assessing measures without zooming in on the detail of these measures.

Specifically, the analysis conducted highlights the relevance of the WTO covered agreements with respect to the trade and environment-related measures examined, and

²⁰² Marrakesh Agreement, supra note 2 at art.IX:3

²⁰³ J. Bacchus, “*The case for a WTO Climate Waiver*”, 2017.

<https://www.cigionline.org/sites/default/files/documents/NEWEST%20Climate%20Waiver%20-%20Bacchus.pdf>

²⁰⁴ J. Bacchus, “*The case for a WTO Climate Waiver*”, 2017.

<https://www.cigionline.org/sites/default/files/documents/NEWEST%20Climate%20Waiver%20-%20Bacchus.pdf>

²⁰⁵ J. Bacchus, “*The case for a WTO Climate Waiver*”, 2017.

<https://www.cigionline.org/sites/default/files/documents/NEWEST%20Climate%20Waiver%20-%20Bacchus.pdf>

²⁰⁶ The Economist Intelligence Unit, “*Climate Change and Trade Agreements: Friends or Foes?*”, 2019. <https://iccwbo.org/content/uploads/sites/3/2019/03/icc-report-trade-and-climate-change.pdf>

²⁰⁷ The Economist Intelligence Unit, “*Climate Change and Trade Agreements: Friends or Foes?*”, 2019. <https://iccwbo.org/content/uploads/sites/3/2019/03/icc-report-trade-and-climate-change.pdf>

explains the so-called policy space countries have to adopt the identified measures. While the obligations laid out within the WTO agreements place limits on trade-related environmental policies, there appears to be ample space available to ensure measures adopted to advance NDCs are consistent with the WTO framework. spaces within the trade regime through which environmental goals can be achieved with greater efficiency.

A case can be made, however, to enhance linkages between the WTO and measures adopted to advance NDCs. This report proposes various ways in which this can be done. Some of these proposals, like the ratification of NDCs into national law or accession to the Agreement on Government Procurement, can be enacted by individual Member States, and do not require any further negotiation. Other proposals, such as the creation of a climate change waiver in the context of the WTO, would require negotiation and may therefore be to succeed. Nevertheless, the report includes them in an effort to stimulate the discourse and negotiation necessary to fulfil the lofty goals of the Paris Agreement. By focusing on five measures only, and a subset of NDCs, this report is limited in scope. Further research is needed to broaden the work conducted here by identifying additional measures and extending the applicability of those identified above to specific local situations. It is the authors' hope, however, that this report will act as a springboard for further research and action within this field.

Bibliography

Abman, Ryan, and Clark Lundberg. 2020. "Does free trade increase deforestation? the effects of regional trade agreements." *Journal of the Association of Environmental and Resource Economists* 7, no. 1 (2020): 35-72. Accessed on 17 November, 2021. <https://www.journals.uchicago.edu/doi/pdfplus/10.1086/705787>

Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410.

Amelang, Sören. 2021. *Electric highways offer the most efficient path to decarbonise trucks*. 1 February. <https://www.cleanenergywire.org/factsheets/electric-highways-offer-most-efficient-path-decarbonise-trucks>.

APEC. 'ANNEX C - APEC List of Environmental Goods'. Accessed 18 October 2021. https://www.apec.org/Meeting-Papers/Leaders-Declarations/2012/2012_aelm/2012_aelm_annexC.

APEC. 'APEC Advances Environmental Goods Tariffs Cut'. Accessed 28 November 2021. https://www.apec.org/press/news-releases/2021/0311_mag.

Appellate Body Report, *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products*, WT/DS135/AB/R, adopted 15 March 2001.

Appellate Body Report, *European Communities—Measures Prohibiting the Importation and Marketing of Seal Products*, WT/DS400/AB/R, WT/DS401/AB/R, adopted June 18 2014.

Appellate Body Report, *United States—Measures Affecting the Production and Sale of Clove Cigarettes*, WT/DS406/AB/R, adopted 24 April 2012

Appellate Body Report, *United States—Measures Concerning the Importation, Marketing, and Sale of Tuna and Tuna Products*, WT/DS381/AB/R, adopted June 13 2012.

Appellate Body Report, *United States—Import of Certain Shrimp and Shrimp Products*, WT/DS59/AB/R, adopted 6 November 1998.

Bacchus, James. 2017. «The Content of a WTO Climate Waiver <https://www.cigionline.org/publications/content-wto-climate-waiver/>.

Bhan, Manan, Dhruva Sharma, A. S. Ashwin, and Swapan Mehra. 2017. "Policy forum: Nationally-determined climate commitments of the BRICS: At the forefront of forestry-based climate change mitigation." *Forest Policy and Economics* 85: 172-175. Accessed on 16 November, 2021. <https://doi.org/10.1016/j.forpol.2017.09.013>.

Bhardwaj, Naina. 2021. *India's PLI Scheme for ACC Battery Storage Manufacturing*. 28 May. <https://www.india-briefing.com/news/indias-pli-scheme-for-acc-battery-storage-manufacturing-22349.html/>.

Bilogistik. 2016. *Towards more environmentally friendly goods transport*. 27 October. <https://www.bilogistik.com/en/blog/environmentally-friendly-goods-transport/>.

Blackman, Allen, Leonard Goff, and Marisol Rivera Planter. 2018. "Does eco-certification stem tropical deforestation? Forest Stewardship Council certification in Mexico," *Journal of Environmental Economics and Management* 89: 306-333. Accessed on 7 December 2021. <https://doi.org/10.1016/j.jeem.2018.04.005>

Bodansky, Daniel, and Jessica C Lawrece. 'Trade And Environment'. In *The Oxford Handbook of International Trade Law*, edited by D. L. Bethlehem, Isabelle van Damme, Donald MacRae, and Rodney Neufelf, 505–37. Oxford; New York: Oxford University Press, 2009.

Charnovitz, Steve, and Carolyn Fischer. 2015. "Canada–Renewable Energy: Implications for WTO Law on Green and Not-So-Green Subsidies." *World Trade Review* 14, no. 2 (2015): 177–210. doi:10.1017/S1474745615000063.

Chalmin, Philippe and Jegourel, Yves. 2020. *Cyclops Report: World Commodities Markets*, Cercle Cyclope.

China — Measures Affecting Imports of Automobile Parts, No. WT/DS339/AB/R, WT/DS340/AB/R, WT/DS342/AB/R (Report of the Appellate Body 15 December 2008).

Commune de Grande-Synthe et autre., No. 427301 (Conseil d'État (France) November 19, 2020).

Conference of the Parties serving as the meeting of the Parties to the Paris Agreement. "Glasgow Climate Pact.," November 13, 2021. FCCC/PA/CMA/2021/L.16 (Advance version). https://unfccc.int/sites/default/files/resource/cma2021_L16_adv.pdf.

Cuadros, Miguel. 2016. «The Non-discrimination Principle and VAT: Rules of Thumb for Trade and Tax Policy-Makers.» *Global Trade and Customs Journal* 62-70.

Decision of 28 November 1979, "Differential and more favourable treatment reciprocity and fuller participation of developing countries," (L/4903),

GATT, https://www.wto.org/english/docs_e/legal_e/enabling1979_e.htm

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). 2017. «Sectoral Implementation of nationally determined contributions: energy efficiency with a focus on buildings.» Accessed on October 25, 2021. <https://transparency-partnership.net/sites/default/files/u2618/giz2017-en-ndcs-sectoral-implementation-energy-efficiency.pdf>.

Dijkstra, Hanna, Pieter van Beukering, and Roy Brouwer. 2021. "In the business of dirty oceans: Overview of startups and entrepreneurs managing marine plastic." *Marine Pollution Bulletin* 162: 111880. Accessed on 29 November 2021. <https://doi.org/10.1016/j.marpolbul.2020.111880>

'Draft Guidelines on the Protection of the Atmosphere.' International Law Commission, 2021. <https://documents-dds-ny.un.org/doc/UNDOC/LTD/G21/108/18/PDF/G2110818.pdf?OpenElement>.

Dupuy, Pierre-Marie, and Jorge E. Viñuales. *International Environmental Law*. 2018th ed. Cambridge University Press, n.d.

Elkahwagy, Rana, Vandana Gyanchandani, and Dario Piselli. 2017. "UNFCCC Nationally Determined Contributions: Climate Change and Trade." *Center for Trade and Economic Integration (CTEI) Working Paper* 2017-02.

European Commission. 2020. «Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the region. A renovation Wave for Europe - greening our buildings, creating jobs, improving lives .» Accessed on October 25, 2021. <https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX%3A52020DC0662>

European Commission. *Energy performance of buildings directive*. https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en.

European Commission. 2021. Executive Summary of the Impact Assessment Report: minimizing the risks of deforestation and forest degradation associated with products placed on the EU market. SWD(2021) 327 final. https://ec.europa.eu/environment/system/files/2021-11/SWD_2021_327_1_EN_resume_impact_assessment_part1_v2.pdf

European Commission. 2020. *Renovation Wave*. Accessed on October 25, 2021. https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en.

European Commission. 2018. «EU steps up WTO action against China's forced technology transfers .» 20 December . <https://trade.ec.europa.eu/doclib/press/index.cfm?id=1963>.

European Commission, Proposal for a Regulation of the European Parliament and of the Council on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010. 2021. Accessed on 8 December 2021. https://ec.europa.eu/environment/publications/proposal-regulation-deforestation-free-products_en.

European Parliament. 2019. «European Policies on Climate and energy towards 2020,2030 and2050.» [https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/631047/IPOL_BRI\(2019\)631047_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/631047/IPOL_BRI(2019)631047_EN.pdf)

Eurostat. 'EU and Main World Traders'. Statistics Explained, October 2021. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_and_main_world_traders.

FAO. 2007. "Manual on deforestation, degradation, and fragmentation using remote sensing and GIS". <https://www.fao.org/forestry/18222-045c26b711a976bb9d0d17386ee8f0e37.pdf>

Federative Republic of Brazil. 2016. "Intended Nationally Determined Contribution Towards Achieving the Objective of the United Nations Framework Convention on Climate Change." Accessed on November, 2021.

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Brazil%20First/BRAZIL%20iNDC%20english%20FINAL.pdf>

Forest Stewardship Council, 2021. Accessed on 8 December 2021. <https://fsc.org/en>

From Pollution to Solution: A Global Assessment of Marine Litter and Plastic Pollution.” United Nations Environment Programme (UNEP), 2021. <https://www.unep.org/resources/pollution-solution-global-assessment-marine-litter-and-plastic-pollution>.

Garsous, Grégoire, and Stephan Worack. 2021. “Trade as a channel for environmental technologies diffusion: The case of the wind turbine manufacturing industry.” No. 2021/01. OECD Publishing. Accessed on 28 October, 2021. <https://doi.org/10.1787/ce70f9c6-en>

General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194

“Glasgow Leaders’ Declaration on Forests and Land Use,” UN Climate Change Conference (COP26) at the SEC – Glasgow 2021, November 2, 2021, <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.

GOV.UK. “COP26 Declaration on Accelerating the Transition to 100% Zero Emission Cars and Vans.” Accessed November 14, 2021. <https://www.gov.uk/government/publications/cop26-declaration-zero-emission-cars-and-vans/cop26-declaration-on-accelerating-the-transition-to-100-zero-emission-cars-and-vans>.

Gonçalves, Luísa Cortat Simonetti. 2021. “The Effects of Plastics on Climate Change: An Analysis of the Potential Responses within the Nationally Determined Contributions (NDCs)”, *Yearbook of International Environmental Law*, yvab001, Accessed on 28 November 2021 <https://doi.org/10.1093/yiel/yvab001>

Grassi, Giacomo, Jo House, Frank Dentener, Sandro Federici, Michel den Elzen, and Jim Penman. 2017. "The key role of forests in meeting climate targets requires science for credible mitigation." *Nature Climate Change* 7, no. 3: 220-226. Accessed on 16 November, 2021. <https://doi.org/10.1038/nclimate3227>.

He, Lihua. 2020. «The incentive effects of different government subsidy policies on green buildings.» *Renewable and Sustainable Energy Reviews*. DOI:10.1016/j.rser.2020.110123

Helinski, Olivia K., Cara J. Poor, and Jordyn M. Wolfand. 2021. "Ridding our rivers of plastic: A framework for plastic pollution capture device selection." *Marine Pollution Bulletin* 165: 112095. Accessed on 28 November 2021. <https://doi.org/10.1016/j.marpolbul.2021.112095>

Kastens, Jude H., J. Christopher Brown, Alexandre Camargo Coutinho, Christopher R. Bishop, and Julio Cesar DM Esquerdo. 2017. "Soy moratorium impacts on soybean and deforestation dynamics in Mato Grosso, Brazil." *PloS one* 12, no. 4: e0176168. Accessed on 16 November, 2021. <https://doi.org/10.1371/journal.pone.0176168>.

Kaza, Silpa, Lisa Yao, Perinaz Bhada-Tata, and Frank Van Woerden. 2018. *What a waste 2.0: a global snapshot of solid waste management to 2050*. World Bank Publications. Accessed on 28 November 2021. <https://openknowledge.worldbank.org/handle/10986/30317>

Kershaw, P. 2016 *Marine plastic debris and microplastics—Global lessons and research to inspire action and guide policy change*. United Nations Environment Programme. Accessed on November 29 2021. <https://wedocs.unep.org/handle/20.500.11822/7720>

Koch, Rika. *Green Public Procurement under WTO Law. Experience of the EU and Prospects for Switzerland*. Vol. 9. EYIEL Monographs - Studies in European and International Economic Law. Springer, 2019.

IEA. 2020. *Energy Efficiency 2020*. Accessed on October 25, 2021. <https://www.iea.org/reports/energy-efficiency-2020/buildings>.

IEA. 2013. «Energy Efficiency: Market Trends and Medium-Term Prospects.» <https://doi.org/10.1787/9789264206052-en>.

IEA. 2020. "Renewables: Analysis and Forecast to 2025." International Energy Agency, Paris. Accessed on 28 October, 2021. https://iea.blob.core.windows.net/assets/1a24f1fe-c971-4c25-964a-57d0f31eb97b/Renewables_2020-PDF.pdf

IEA. 2021. "Global Energy Review 2021." Paris: International Energy Agency, 12. <https://www.iea.org/reports/global-energy-review-2021>

India — Certain Measures Relating to Solar Cells and Solar Modules., No. WT/DS456/AB/R (Report of the Appellate Body September 16, 2016).

Instituto Brasileiro de Geografia e Estatística. "Legal Amazon." IBGE. Accessed November 18, 2021. <https://www.ibge.gov.br/en/geosciences/environmental-information/vegetation/17927-legal-amazon.html?=&t=o-que-e>.

International Energy Agency. 2021. *Faster Adoption and Manufacturing of Hybrid and EV (FAME) II*. 12 May. <https://www.iea.org/policies/7450-faster-adoption-and-manufacturing-of-hybrid-and-ev-fame-ii>.

International Energy Agency. 2020. *Tracking Transport 2020*. May. <https://www.iea.org/reports/tracking-transport-2020>.

Lim, Aik Hoe, Sajal Mathur, and Gowoon Suk. 'Trade and Environment: What Can We Learn from Trade Policy Reviews?' Staff Working Paper. WTO, 2020. https://www.wto.org/english/res_e/reser_e/ersd202006_e.pdf.

International Transport Forum . 2021. *NDC Transport Initiative for Asia* . <https://www.itf-oecd.org/ndc-transport-initiative-asia>.

Maggio, Amber Rose. *Environmental policy, non-product related process and production methods and the law of the World Trade Organization*. Vol. 1. Springer, 2017.

Meijer, Karen S. 2015. "A comparative analysis of the effectiveness of four supply chain initiatives to reduce deforestation." *Tropical Conservation Science* 8, no. 2: 583-597. Accessed on 7 December 2021. <https://journals.sagepub.com/doi/pdf/10.1177/194008291500800219>

Ministry of Environment and Forestry, Republic of Indonesia . 2020. «National Plastic Waste Reduction Strategic Actions for Indonesia.» <https://wedocs.unep.org/bitstream/handle/20.500.11822/32898/NPWRSI.pdf?sequence=1&isAllowed=y>.

Monteiro, José-Antonio. ‘Typology of Environment-Related Provisions in Regional Trade Agreements’. WTO Working Paper. World Trade Organization, 2016. https://www.wto.org/english/res_e/reser_e/ersd201613_e.pdf.

Morin, Jean Frédéric, Joost Pauwelyn, and James Hollway. “The Trade Regime as a Complex Adaptive System: Exploration and Exploitation of Environmental Norms in Trade Agreements.” *Journal of International Economic Law* 20, no. 2 (June 2017): 365–90. <https://doi.org/10.1093/jiel/jgx013>.

National Portal of India . s.d. *Decarbonizing Transport: Redefining mobility policies in India*. <https://www.niti.gov.in/decarbonising-transport-redefining-mobility-policies-india>.

“Nationally Determined Contributions under the Paris Agreement. Synthesis Report by the Secretariat.” UNFCCC Secretariat, September 17, 2021. https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf.

‘Nationally Determined Contributions under the Paris Agreement. Synthesis Report by the Secretariat.’ UNFCCC Secretariat, 17 September 2021. https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf.

NDC Registry. “Brazil First NDC (Updated Submission),” December 9, 2020. <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>.

NDC Registry. “China’s Achievements, New Goals and New Measures for Nationally Determined Contributions,” October 28, 2021. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China%E2%80%99s%20Achievements,%20New%20Goals%20and%20New%20Measures%20for%20Nationally%20Determined%20Contributions.pdf>.

NDC Registry. “EU NDC Submission,” December 17, 2020. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/European%20Union%20First/EU_NDC_Submission_December%202020.pdf.

NDC Registry. “Final Updated NDC for the Republic of Mauritius,” October 1, 2021. <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>.

NDC Registry. “India NDC,” October 2, 2016. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/India%20First/INDIA%20INDC%20TO%20UNFCCC.pdf>.

NDC Registry. “Malawi Updated NDC,” July 30, 2021. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Malawi%20First/Malawi%20Updated%20NDC%20July%202021%20submitted.pdf>.

NDC Registry. "New Zealand NDC," November 3, 2021. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/New%20Zealand%20First/New%20Zealand%20NDC%20November%202021.pdf>.

NDC Registry. "South Africa Updated First NDC," September 27, 2021. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa%20updated%20first%20NDC%20September%202021.pdf>.

NDC Registry. "United States NDC," April 22, 2021. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20States%20of%20America%20First/United%20States%20NDC%20April%202021%202021%20Final.pdf>.

NDC Registry. "UK Nationally Determined Contribution," December 12, 2020. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20Kingdom%20of%20Great%20Britain%20and%20Northern%20Ireland%20First/UK%20Nationally%20Determined%20Contribution.pdf>

Neufelf, 505–37. Oxford ; New York: Oxford University Press, 2009.

NOAA. United States Department of Commerce. 2021. "What Are Microplastics?" Accessed on 29 November 2021. <https://oceanservice.noaa.gov/facts/microplastics.html>

'OECD Companion to the Inventory of Support Measures for Fossil Fuels.' OECD, 2018. <https://www.oecd-ilibrary.org/sites/9789264286061-en/index.html?itemId=/content/publication/9789264286061-en>.

Office of Energy Efficiency and Renewable Energy - U.S. Department of Energy. *Window Types and Technologies* . Accessed on October 26, 2021. <https://www.energy.gov/energysaver/window-types-and-technologies>.

'Offshore Renewables: An Action Agenda for Deployment (A Contribution to the G20 Presidency)'. International Renewable Energy Agency (IRENA), 2021. <https://www.irena.org/publications/2021/Jul/Offshore-Renewables-An-Action-Agenda-for-Deployment>.

Order of the First Senate, No. 2656/18 (German Federal Constitutional Court March 24, 2021).

Partiti, Enrico. 2020. "Regulating trade in forest-risk commodities." *Journal of World Trade* 54, no. 1.

Pauwelyn Joost, Guzman Andrew T. , Hillman Jennifer A. 2016. *International Trade Law*. New York: Wolters Kluwer.

Pendrill, Florence, U. Martin Persson, Javier Godar, and Thomas Kastner. 2019. "Deforestation displaced: trade in forest-risk commodities and the prospects for a global forest transition." *Environmental Research Letters* 14, no. 5: 055003. Accessed on 17 November, 2021. <https://iopscience.iop.org/article/10.1088/1748-9326/ab0d41/pdf>.

Pendrill, Florence, U. Martin Persson, Javier Godar, Thomas Kastner, Daniel Moran, Sarah Schmidt, and Richard Wood. 2019. "Agricultural and forestry trade drives large share of tropical

deforestation emissions." *Global environmental change* 56: 1-10. Accessed on 16 November, 2021. <https://doi.org/10.1016/j.gloenvcha.2019.03.002>.

People's Republic of China. 2016. "Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions." <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China's%20First%20NDC%20Submission.pdf>

Republic of Armenia. 2021. "Decision of the Government of the Republic of Armenia 22 April 2021 N 610-L on Approval of the Nationally Determined Contribution 2021-2030 of the Republic of Armenia to Paris Agreement." Accessed on 26 October, 2021 <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Armenia%20First/NDC%20of%20Republic%20of%20Armenia%20%202021-2030.pdf>

Request for Consultations by Indonesia, European Union—Certain Measures Affecting Palm Oil and Oil Palm Crop-Based Biofuels, WT/DS593/1 (16/12/19)

Rudorff, Bernardo Friedrich Theodor, Marcos Adami, Daniel Alves Aguiar, Maurício Alves Moreira, Marcio Pupin Mello, Leandro Fabiani, Daniel Furlan Amaral, and Bernardo Machado Pires. 2011. "The Soy Moratorium in the Amazon Biome Monitored by Remote Sensing Images" *Remote Sensing* 3, no. 1: 185-202. Accessed on November 18, 2021. <https://doi.org/10.3390/rs3010185>

Sangster, Warwick. 2006. «Benchmark Study on Green Buildings: Current Policies and Practices in Leading Green Building Nations .» Accessed October 26, 2021. <http://www3.cec.org/islandora-gb/fr/islandora/object/greenbuilding%3A143/datastream/OBJ-EN/view>.

Sifonios, David. 2018. *Environmental process and production methods (PPMs) in WTO law*. Vol. 3. Springer.

Stabile, Marcelo CC, André L. Guimarães, Daniel S. Silva, Vivian Ribeiro, Marcia N. Macedo, Michael T. Coe, Erika Pinto, Paulo Moutinho, and Ane Alencar. 2020. "Solving Brazil's land use puzzle: Increasing production and slowing Amazon deforestation." *Land Use Policy* 91: 104362. Accessed on 16 November, 2021. <https://doi.org/10.1016/j.landusepol.2019.104362>.

Sustainability Victoria. 2021. «Reducing heat loss through home windows .» Accessed on October 24, 2021. <https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/building-or-renovating/windows-and-shading/reducing-heat-loss-through-windows>

Tacconi, Luca, and Muhammad Zahrul Muttaqin. 2019. "Reducing emissions from land use change in Indonesia: An overview." *Forest Policy and Economics* 108: 101979. Accessed on 17 November, 2021. <https://doi.org/10.1016/j.forpol.2019.101979>.

"Technical Summary of Climate Change 2021. The Physical Science Basis." Intergovernmental Panel on Climate Change, n.d. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report_smaller.pdf.

The State Council of the People's Republic of China. 2009. "The Renewable Energy Law of the People's Republic of China, adopted at the 14th Session of the Standing Committee of the 10th National People's Congress on 28 February 2005; Amended According to the Decision of the 12th Meeting of the Standing Committee of the 11th National People's Congress of the People's

Republic of China on 26 December 2009.” Accessed on 28 October, 2021. http://english.www.gov.cn/archive/laws_regulations/2014/08/23/content_281474983043598.html

“Trading into a Bright Energy Future: The Case for Open, High-Quality Solar Photovoltaic Markets.” World Trade Organization (WTO) and International Renewable Energy Agency (IRENA), 2021. <https://www.irena.org/publications/2021/Jul/Trading-into-a-bright-energy-future-Solar-photovoltaic>.

“Trade and Development. Report 2021. From Recovery to Resilience: The Development Dimension.” United Nations Conference on Trade and Development (UNCTAD), 2021. https://unctad.org/system/files/official-document/tdr2021_part2_en.pdf.

“Trade and Green Economy. A Handbook.” International Institute for Sustainable Development (IISD) and United Nations Environment Programme (UNEP), 2014. <https://www.iisd.org/publications/trade-and-green-economy-handbook-third-edition>.

Trade - European Commission. ‘Commission Proposes New EU Generalised Scheme of Preferences to Promote Sustainable Development in Low-Income Countries.’ Accessed 18 October 2021. <https://trade.ec.europa.eu/doclib/press/index.cfm?id=2303>.

“Trade Remedies: Targeting the Renewable Energy Sector.” United Nations Conference on Trade and Development (UNCTAD), 2014. https://unctad.org/system/files/official-document/ditcted2014d3_en.pdf.

Tropical Forest Alliance and World Economic Forum. 2018. “The Roadmap to Financing Deforestation-Free Commodities, World Economic Forum”. Accessed on 17 November, 2021. <https://www.tropicalforestalliance.org/assets/Uploads/The-Roadmap-to-Financing-Deforestation-Free-Commodities.pdf>.

UN Climate Change Conference (COP26) at the SEC – Glasgow 2021. “Glasgow Leaders’ Declaration on Forests and Land Use,” November 2, 2021. <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.

UNCTAD. 2001. «Transfer of Technology.» <https://unctad.org/system/files/official-document/psiteiitd28.en.pdf>.

UNCTAD - ICTSD. 2008. «Does TRIPS Art. 66.2 Encourage Technology Transfer to LDCs? An Analysis of Country Submissions to the TRIPS Council (1999-2007).» December. https://unctad.org/system/files/official-document/iprs_pb20092_en.pdf.

United Nations Environment Programme. 2021. *From Pollution to Solution: A global assessment of marine litter and plastic pollution. Synthesis*. Nairobi. Accessed on 28 November 2021: <https://wedocs.unep.org/bitstream/handle/20.500.11822/36965/POLSOLSum.pdf>

United Nations Environment Programme. 2018. «A guide for Incorporating Buildings Actions in NDCs.» Accessed on October 24, 2021. https://globalabc.org/sites/default/files/2020-03/GABC-NDC-GUIDE_ENGLISH.pdf

United Nations Environment Programme, ed. “The Heat Is On. A World of Climate Promises Not yet Delivered. Emissions Gap Report 2021.” 2021. https://wedocs.unep.org/bitstream/handle/20.500.11822/36991/EGR21_ESEN.pdf.

UNFCCC. 2020 «The update of the nationally determined contribution of the European Union and its Member States.» Accessed on October 24, 2021. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/European%20Union%20First/EU_NDC_Submission_December%202020.pdf.

UNFCCC Secretariat. 2021. «Nationally determined contributions under the Paris Agreement.» Synthesis report, Glasgow. https://unfccc.int/sites/default/files/resource/cma2021_08E.pdf

UNFCCC Secretariat. 2021. "Nationally determined contributions under the Paris Agreement." Synthesis report, Glasgow. https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf

UNFCCC. 2016. «Technology and UNFCCC: Building the Foundation for Sustainable Development.» https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/NAD_EBG/54b3b39e25b84f96aeada52180215ade/b8ce50e79b574690886602169f4f479b.pdf.

UNSD - Classification Detail. United Nations. United Nations Statistics Division. Accessed 29 October, 2021. <https://unstats.un.org/unsd/classifications/Econ/Detail/EN/2089/850231>.

Urgenda, ECLI:NL:HR:2019:2007 (Hoge Raad (Supreme Court of the Netherlands) 2019).

US — Gasoline, No. WT/DS2/AB/R (Report of the Appellate Body 29 April 1996).

US Office of Energy Efficiency and Renewable Energy. *Why Building Energy Codes?* Accessed on October 21, 2021. <https://www.energycodes.gov/why-building-energy-codes>.

Van der Ven, Hamish, Catherine Rothacker, and Benjamin Cashore. "Do eco-labels prevent deforestation? Lessons from non-state market driven governance in the soy, palm oil, and cocoa sectors." *Global environmental change* 52 (2018): 141-151. Accessed on 7 December 2021. <https://doi.org/10.1016/j.gloenvcha.2018.07.002>

WWF. 2014. "The growth of soy: Impacts and solutions." Accessed on 16 November, 2021. http://awsassets.wwfdk.panda.org/downloads/wwf_soy_report_final_jan_19.pdf.

World Resources Institute. 2019. *Resources for strengthening Climate Action: Transport Sector*. <https://www.wri.org/ndcs/resources/transport-sector>.

WTO. 2018. "Making Trade Work for the Environment, Prosperity and Resilience." WTO, Geneva/UN Environment, Nairobi. <https://doi.org/10.30875/f14f8c90-en>

World Trade Organization. "Short Answers to Big Questions on the WTO and the Environment." WTO, October 16, 2020. <https://doi.org/10.30875/b42b7bb6-en>.

World Trade Organization. s.d. *Technology Transfer*. https://www.wto.org/english/tratop_e/trips_e/techtransfer_e.htm.

WTO. «Agreement on Trade-Related Aspects of Intellectual Property Rights as Amended by the 2005 Protocol Amending the TRIPS Agreement.» https://www.wto.org/english/docs_e/legal_e/trips_e.htm#part1.

WTO. «WTO Analytical Index: SCM Agreement Article 3 Jurisprudence.» https://www.wto.org/english/res_e/publications_e/ai17_e/subsidies_art3_jur.pdf.

World Trade Organization. “Short Answers to Big Questions on the WTO and the Environment.” WTO, October 16, 2020. <https://doi.org/10.30875/b42b7bb6-en>.

WTO Economic Research and Statistics Division. 2018. «Least-developed countries, transfer of technology and the TRIPS Agreement.» 22 February . https://www.wto.org/english/res_e/reser_e/ersd201801_e.pdf.

WTO-UNEP. 2009. «Trade and Climate Change: A report by the United Nations Environment Programme and the World Trade Organization.» Geneva. https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf

World Tariff Profiles 2021’. World Trade Organization, International Trade Center and UNCTAD, 2021. https://www.wto.org/english/res_e/booksp_e/tariff_profiles21_e.pdf.

Jinping, Xi. 2020 "Statement by HE Xi Jinping President of the People's Republic of China at the General Debate of the 75th Session of The United Nations General Assembly." *Ministry of Foreign Affairs of the People's Republic of China*. Accessed on 27 October, 2021. https://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1817098.shtml

Zhiqiang Wang, Qi Tin, Jie Jia. 2021. «MDPI Journal of Sustainability.» *Numerical Study on Performance Optimization of an Energy-Saving Insulated Window*. Accessed on October 24, 2021. <https://doi.org/10.3390/su13020935>.

Zhou, N., Lu, H., Khanna, N., Liu, X., Fridley, D., Price, L., Shen, B., Feng, W., Lin, J., Szum, C., Ding, C., 2020. “China Energy Outlook: Understanding China’s Energy and Emissions Trends.” Accessed on 27 October, 2021. <https://china.lbl.gov/sites/default/files/China%20Energy%20Outlook%202020.pdf>

———. ‘Short Answers to Big Questions on the WTO and the Environment’. WTO, 16 October 2020. <https://doi.org/10.30875/b42b7bb6-en>.