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International trade and development 2023

Report of the Secretary-General

Summary

Member States are beginning to pursue more robust policy measures in terms of the global sustainable energy transition to enable countries to meet their commitments under the Paris Agreement and other environmental objectives. This is beginning to be reflected in patterns of trade and in efforts to create policy space within the multilateral trading system. The growing interconnectedness of the global trade and climate policy regimes has not been accompanied by effective coordination among decision makers in the climate and trade domains both within and across countries.

The present report explores how the nexus between trade and environmental policy can be improved to better address the triple environmental crisis of climate change, biodiversity loss and pollution, to enable developing countries to fulfil their obligations under the Paris Agreement and to align the multilateral trading system with these goals. Trade can play a crucial role in the global energy transition by providing new market opportunities for developing countries, elevating their participation to extend beyond raw materials and low-value additions to encompass higher-value segments of green value chains, as well as creating new business opportunities. To achieve a stronger nexus between trade and the environment, policy coherence is needed at the national level, among countries and within the multilateral system, including multilateral trade rules and multilateral and international conventions related to environmental sustainability.

The present report has been prepared by the secretariat of the United Nations Conference on Trade and Development pursuant to General Assembly resolution 77/151.

* A/78/150.

I. Introduction: trade as a part of the solution to the triple planetary crisis

1. The goods and services that countries trade internationally reflect the economic environment of the day. In recent years, the sector of environment-related products, generally termed “environmental goods”, has shown a notable growth in merchandized trade, reflecting the increasing concerns and awareness of businesses, consumers and Governments with regard to the triple planetary crisis of climate change, biodiversity loss and pollution.[1]

2. International trade is thus an integral element of the solution to the triple planetary crisis. It is imperative to fully understand how:

(a) Trade facilitates access to inputs needed for sustainable development through energy transition and provides new market opportunities in environmental goods and services;

(b) Growing environmental concerns interact with the international trading system;

(c) The nexus between trade and environmental policy can be improved for developing countries to better address the triple planetary crisis, while achieving important socioeconomic development goals.

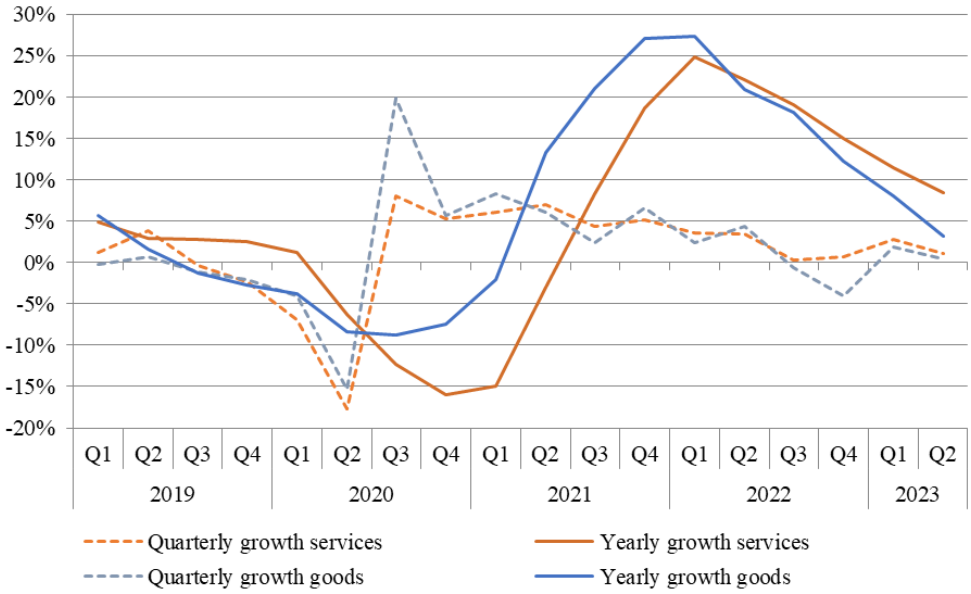
II. Trade trends reflecting decarbonization needs

3. International trade bounced back strongly from the supply and transport disruptions of the coronavirus disease (COVID-19) pandemic. The strong trade recovery continued in the first three quarters of 2022, defying geopolitical tensions. The value of global trade reached a record $32 trillion in 2022, an increase of approximately $4 trillion from the previous year.[2] In the latter half of 2022, trade growth was slowed by deteriorating economic conditions and inflationary pressures (see figure I). The slowdown hit developing countries the hardest. Developing countries’ imports and exports in the fourth quarter of 2022 fell by 6 per cent, compared with a 3 per cent decline for developed countries.

[1] Secretariat of the United Nations Framework Convention on Climate Change, “What is the triple planetary crisis?”, 13 April 2022.

[2] United Nations Conference on Trade and Development (UNCTAD), “Global trade update”, June 2023.

Figure I
Global trade trends



Source: United Nations Conference on Trade and Development (UNCTAD), "Global trade update", June 2023; and nowcast from the UNCTADstat database. Data for 2023 are estimates.

A. Record trade in environmental goods

4. With uncertainty over inflation, exchange rate concerns and the risky combination of high interest rates and public debt, a return to a high growth path for trade is not guaranteed in 2023. However, certain sectors, including environmental goods, are expected to defy these challenges and continue to benefit from high levels of growth.

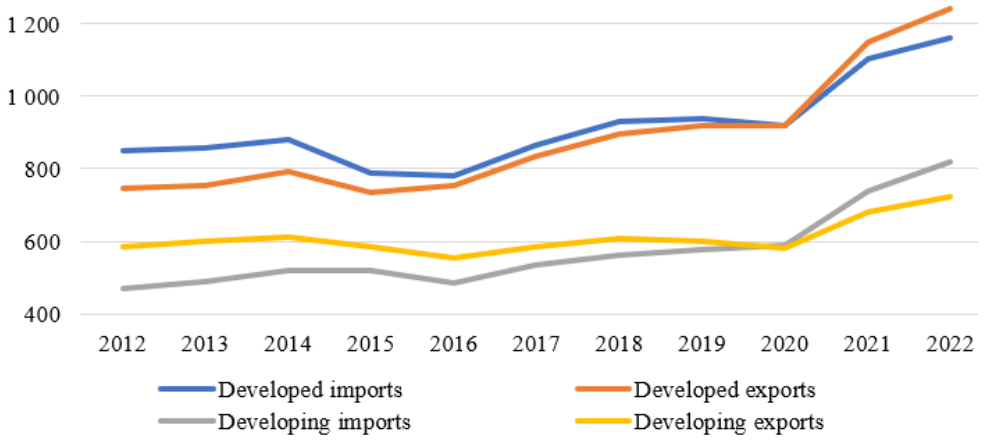
5. Given the lack of an internationally agreed definition or scope of environmental goods, the analysis contained in the present report is based on a list that combines the environmental goods identified by the Organisation of Economic Co-operation and Development (OECD) and the Asia-Pacific Economic Cooperation forum.[3] The combined list encompasses industrial products that are more energy efficient, use fewer resources and emit less pollution than their traditional counterparts, for example, solar panels, wind turbines, electric cars and filtration systems. The United Nations Conference on Trade and Development (UNCTAD) uses a wider definition of environmentally preferable products, defining them as products that cause significantly less environmental harm at some stage of their life cycle than alternative products that serve the same purpose. Examples include natural fibres, organic agricultural products, recyclable and biodegradable products and sustainably produced forest products.[4] The following statistics are based on the combined list, with the understanding that it is not the only list that provides the scope and definition of environmental goods.

[3] OECD, "Environmental goods: a comparison of the APEC and OECD lists", OECD Trade and Environment Working Paper No. 2005-04 (2005).

[4] See TD/B/COM.1/70 and UNCTAD, *Trade and Environment Review 2023: Building a Sustainable and Resilient Ocean Economy Beyond 2023* (Geneva, 2023).

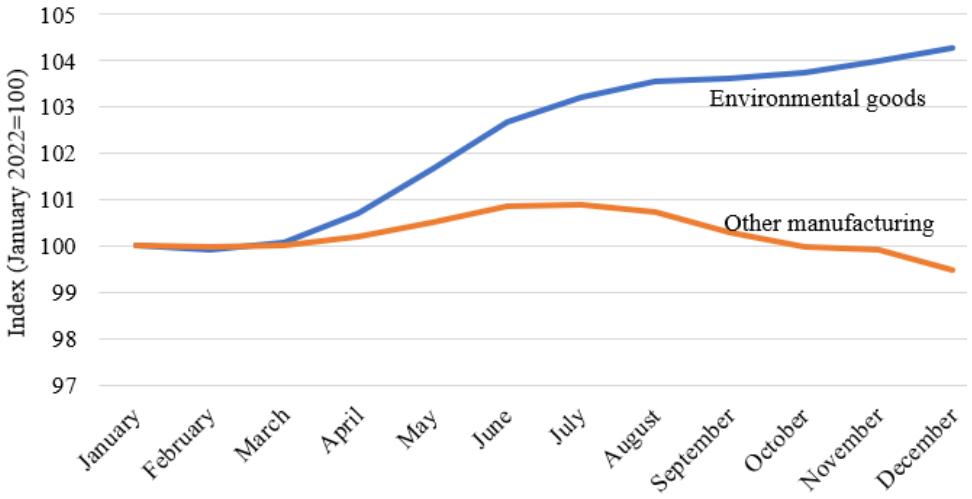
6. As global concern over the triple planetary crisis increases, more countries, both developed and developing, are committed to transforming their production to reduce carbon footprints. As a result, the market for environmental goods has been expanding rapidly (see figure II). In 2022, international trade in environmental goods reached an unprecedented level of almost of $2 trillion (or 6 per cent of world trade), an increase of more than $100 billion from the previous year. Significantly, trade in environmental goods continued to increase despite the global trade slowdown in the second half of 2022 (see figure III).

Figure II
Trade in environmental goods, 2012–2022
(Billions of United States dollars)



Source: UNCTAD calculations based on the UN Comtrade Database. Data for 2022 are preliminary.

Figure III
Trade in environmental goods relative to other manufacturing, 2022



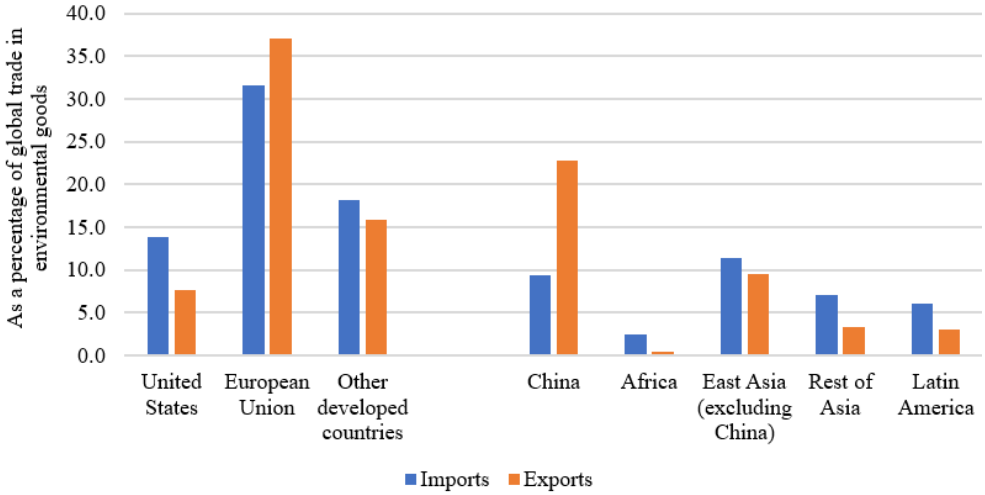
Source: UNCTAD calculations based on the UN Comtrade Database.

7. Although developing countries trade more environmental goods today than ever before, the market remains heavily concentrated. In 2022, the top five green goods exporters accounted for more than half of global environmental goods exports (see figure IV). The European Union is the leading exporter with a market share of 37 per cent, followed by China (23 per cent), the United States of America (8 per cent) and

Japan (6 per cent). Developing countries that export a non-trivial amount of environmental goods include Mexico, India and Türkiye. The leading importers are the European Union (32 per cent), the United States (14 per cent), China (9 per cent) and the United Kingdom of Great Britain and Northern Ireland (3 per cent).

8. A large portion of environmental goods trade is North-North, that is, flows among developed countries. South-South trade in environmental goods in 2022 amounted to $350 billion, less than half of the North-North equivalent, $800 billion (see table below).

Figure IV
Imports and exports of environmental goods, 2022



Source: UNCTAD calculations based on the UN Comtrade Database.

Trade in environmental products by selected economies and country groupings (percentage of global trade in environmental products, 2021)

	Exporter		
Importer	*Developed countries (North)*	*Developing countries (South, excluding China)*	*China*
Developed countries (North)	28	13	18
Developing countries (South, excluding China)	15	6	11
China	7	3	–

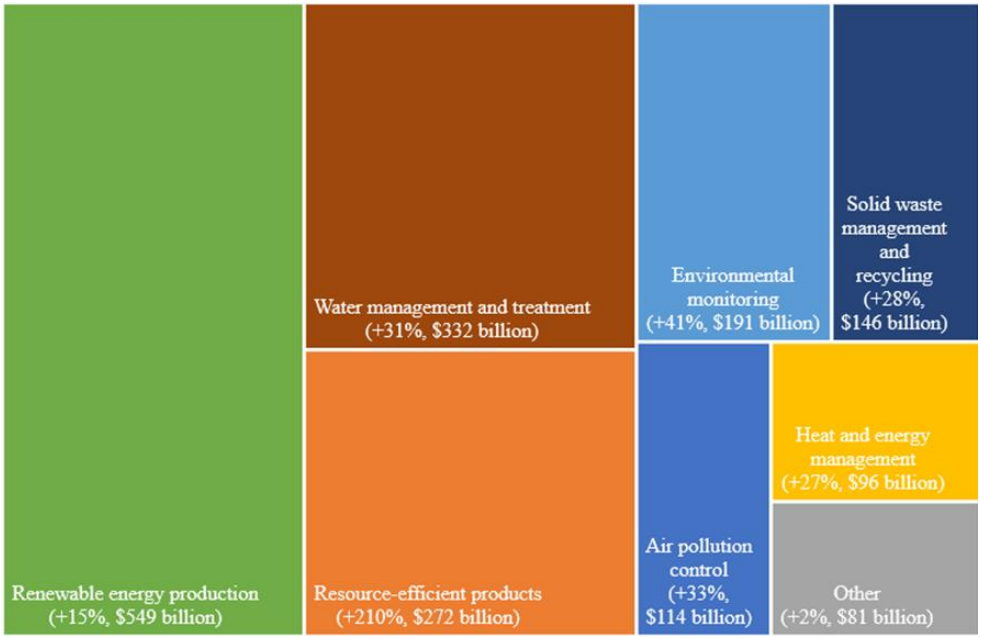
Source: UNCTAD calculations based on the UN Comtrade Database. Percentages do not add up to 100 owing to rounding.

9. In 2021, the most traded environmental goods were those in the group of products for renewable energy production, totalling almost $549 billion (see figure V). This was followed by products for water management and treatment ($332 billion) and resource-efficient products ($272 billion). Cleaner or resource-efficient products have seen the most significant growth in recent years, with trade volume more than tripling since 2012.[5] Within product groups, several environmental

[5] Cleaner or resource-efficient products include hydrogen peroxide, often used for sewage treatment, and cleaner or resource-efficient paints and vanishes. See OECD, "Environmental goods: a comparison of the APEC and OECD lists".

goods performed exceptionally well in 2021, including electric and hybrid vehicles (a 25 per cent increase from the previous year) and wind turbines (a 10 per cent increase from the previous year).

Figure V
Breakdown of environmental goods by product group, 2021 (percentage growth of group since 2012 and total group value in 2021)



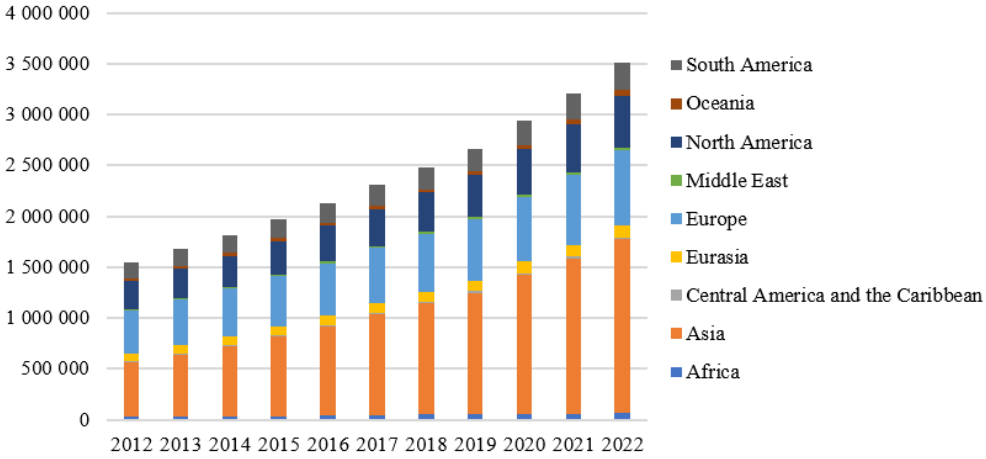
Source: UNCTAD calculations based on the UN Comtrade Database. Areas reflect trade values as a proportion of the total $1.8 trillion market in 2021.

10. In the past decade, developing countries' imports of products for renewable energy production have significantly increased. This is well reflected by the surge in the share of developing countries in installed renewable energy capacity (see figure VI). In particular, the share of developing countries in global installation of solar energy capacity has gone up from 3.5 per cent in 2010 to more than 50 per cent in 2022.[6] The increase in installation has been driven by China and other developing countries such as Viet Nam, India, Brazil and Thailand. Although its share in global renewable energy capacity is lower than that of other developing regions, Africa boasts the world's greatest potential for renewable energy, estimated to reach 310 gigawatts by 2030.[7]

[6] International Renewable Energy Agency database.

[7] Africa Renewable Energy Initiative, "SDG7 Energy Compact of the African Renewable Energy Initiative: a next decade action agenda to advance SDG7 on sustainable energy for all, in line with the goals of the Paris Agreement on Climate Change". Available at www.un.org/sites/un2.un.org/files/arei_energy_compact_-_approved.pdf.

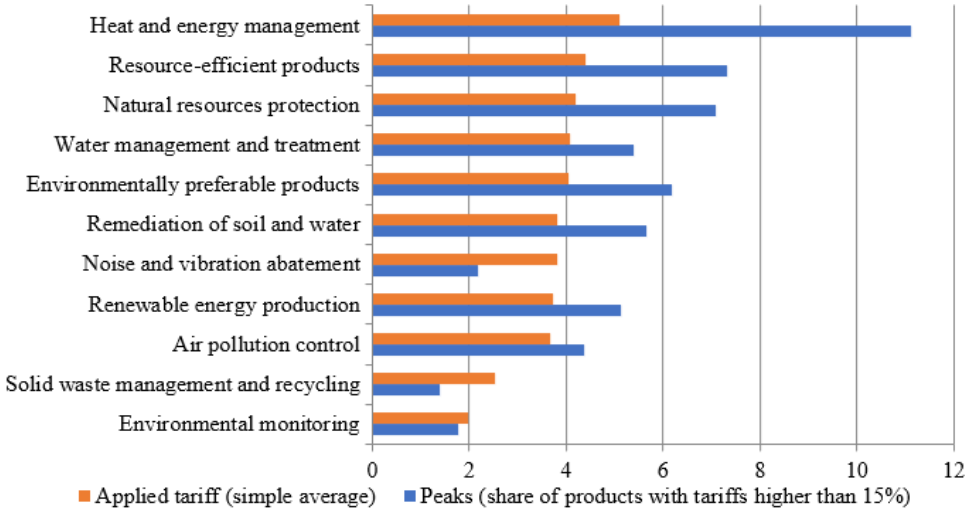
Figure VI
Renewable energy capacity by region (megawatts)



Source: International Renewable Energy Agency database.

11. Tariff barriers affecting environmental goods are generally not too high. In 2021, the average tariff on a range of environmental goods was about 1 per cent in developed countries and 4 per cent in developing countries.[8] Nevertheless, a number of environmental products were subject to high tariff rates, or tariff peaks, within each product group. For example, more than 10 per cent of the products in the heat and energy management category were subject to tariff rates in excess of 15 per cent (see figure VII). Non-tariff measures affecting environmental goods may pose a greater barrier to market access for the environmental goods exports of developing countries (see sect. III.B).

Figure VII
Tariff-affected products by green sector, 2021 (percentage)



Source: UNCTAD, *Key Statistics and Trends in Trade Policy 2022: Green Goods Trade and Trade Policies* (2023).

[8] UNCTAD, *Key Statistics and Trends in Trade Policy 2022: Green Goods Trade and Trade Policies* (2023).

12. The environmental goods market may become less competitive. The global trend of energy transition will continue in the coming years, hence the demand for environmental goods. The question is how developing countries will take advantage of the new trading opportunities at the earliest opportunity. It is not realistic to expect that developing countries will have the same capacity to produce and innovate environmental goods as the current leaders in this sphere. Innovation in climate change adaptation technologies is highly concentrated. The top exporters of environmental goods listed above, such as China, Germany, Japan and the United States, account for more than 60 per cent of global innovation activity in climate adaptation technologies.[9] Furthermore, the leading exporters of environmental goods are opting for what is generally called a "green industrialization" policy, which includes different types of subsidies for local producers of environmental goods and other goods produced with environmentally friendly techniques. This may create new market barriers for foreign companies and make the playing field even more uneven for developing countries (see sect. III).

B. Race to critical minerals within a rules-based, open and non-discriminatory trading system

13. The facilitation of trade in environmental goods and the development of clean technologies in the transition to a low-carbon economy have resulted in significant changes in patterns of international trade and prices. There has been a surge in demand for renewable energy transition commodities such as nickel, lithium, graphite, manganese and cobalt. For example, from 2020 to 2022, the growing demand for electric vehicles contributed to a significant increase in demand for lithium compounds, resulting in higher quantities traded and a rapid price increase.

14. Such demand is likely only to intensify, and huge expansions in the supply of transition-related commodities will be needed. Roughly 3 billion tons of minerals and metals will be needed by 2050, which would require 50 additional lithium mines, 60 additional nickel mines and 17 additional cobalt mines.[10]

15. Without immediate and appropriate policy responses, there could be supply deficits and high price volatility, making it challenging for exporters to predict and plan long-term investment strategies and revenue projections. However, current needs for critical minerals need to be considered in the context of evolving battery chemistries. The composition of batteries has and will continue to be modified as a result of technological developments. The aim is to reduce the use of rarer minerals such as cobalt, in favour of more widely available minerals such as nickel and phosphate.[11] This is expected to reduce the uncertainty associated with potential disruptions to the supply of critical minerals as renewable energy is deployed at a large scale.

16. The anticipated investment in extraction and processing is vastly insufficient to meet the expected demand. Supply deficits are expected to raise the price of minerals. In the case of copper and lithium extraction, for instance, estimates show that the gap in investment in these minerals ranges from $180 billion to $230 billion when comparing the required versus the anticipated investment between 2022 and 2030 to meet mineral demand under the net-zero scenario. Current forecasts show growth in

[9] Antoine Dechezlepretre and others, *Invention and Global Diffusion of Technologies for Climate Change Adaptation: A Patent Analysis* (International Bank for Reconstruction and Development and World Bank, 2020).

[10] See https://unece.org/info/Sustainable-Energy/pub/356790.

[11] See https://unctad.org/system/files/official-document/ditccom2019d5_en.pdf.

demand for lithium compounds and nickel used in batteries and tight supply in the years ahead.[12]

17. There is growing recognition that the mining sector, if well managed, can play a positive role in promoting sustainable development and structural economic transformation. Sustainable energy transition will bring an estimated $1.7 trillion in global mining investment.[13] Many commodities-dependent countries have critical mineral deposits for energy transition, and some are key producers in a highly concentrated supply chain (e.g. the Plurinational State of Bolivia for lithium, the Democratic Republic of the Congo for cobalt, Mongolia for rare earths, Mozambique for graphite and Kazakhstan for bauxite). These countries will have a 20-to-30-year window to tap into these investment flows to generate long-term economic growth, create new green jobs and secure sustainable local development.[14]

18. Extractive industries need support to ensure that the necessary consideration is given to the issues of governance, social equity, environmental impacts and inclusion. Environmental concerns could also be exacerbated as resource-rich countries face pressure to ramp up production quickly. In addition, revenues generated by extractive activities frequently result in poor conditions for pursuing economic diversification. Regarding social equity and inclusion, extractive industries represent "the most pervasive source of the challenges to the full exercise of [Indigenous Peoples'] rights" owing to land loss, the destruction of cultural and spiritual sites, and environment degradation (A/HRC/18/35, para. 57).

19. Amid these tensions, some developed countries have concluded bilateral agreements that include reductions in trade barriers on critical minerals.[15] Opening markets for critical minerals will be fundamental to the global renewable energy transition. It is vital that developing countries are not locked out from these market opportunities and are able to participate in building the capacities of renewable energy technology, rather than only supplying some of the raw materials for this transition.

III. Nexus between the environment and the trading system

20. With increased policy action related to the climate emergency, the global trading system and environmental considerations have become increasingly interconnected. However, because the speed of policy coordination has not matched the development of the climate policy framework, tensions have arisen with regard to market access considerations.

A. How the international trading system currently accommodates environmental concerns

21. The relationship between trade, the environment and natural resources conservation has been taken into consideration since the adoption of the General Agreement on Tariffs and Trade in 1947, as highlighted by the general exceptions

[12] International Energy Agency, *World Energy Investment 2023* (2023). Available at https://iea.blob.core.windows.net/assets/8834d3af-af60-4df0-9643-72e2684f7221/WorldEnergyInvestment2023.pdf.

[13] Ibid.

[14] OECD, *Raw Materials Critical for the Green Transition: Production, International Trade and Export Restrictions*, OECD Trade Policy Paper No. 269 (OECD Publishing, Paris, 2023).

[15] For example, the United States and Japan. See https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2023/march/fact-sheet-agreement-between-government-united-states-america-and-government-japan-strengthening.

clause under article XX.[16] With the establishment of the World Trade Organization (WTO), the importance of environmental concerns in multilateral trade rule-making has become clearer. In the 1994 Agreement establishing the World Trade Organization, it is stated, in the preamble, that the "relations [of the parties to the Agreement] in the field of trade and economic endeavour" should allow "for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment".

22. In 1995, the WTO Committee on Trade and Environment was established to address the interlinkages in the two policy domains. In 2001, the Doha round of trade negotiations, or the Doha Development Agenda, followed a work programme pertaining to trade and the environment, including the relationship between WTO rules and multilateral environmental agreements. Of the more than 250 multilateral environmental agreements currently in force, 15 include trade-related provisions addressing environmental matters that could overlap with the trade disciplines of the General Agreement on Tariffs and Trade and WTO.[17] A well-known example is the Convention on International Trade in Endangered Species of Wild Fauna and Flora, which is aimed at regulating imports and exports of specimens of animals and plants identified in the Convention to ensure that international trade does not threaten their survival. Other examples include the Montreal Protocol on Substances that Deplete the Ozone Layer, aimed at controlling trade in ozone-depleting substances, and the Stockholm Convention on Persistent Organic Pollutants, aimed at restricting the production of and trade in specific chemicals. Thus far, trade-related provisions in multilateral environmental agreements have not been challenged under the WTO dispute settlement mechanism.

23. The mainstreaming of environmental considerations seems to have gone to a new level with the adoption of the Agreement on Fisheries Subsidies at the twelfth WTO Ministerial Conference, held in 2022. In line with Sustainable Development Goal 14, this is the first multilateral trade agreement to focus exclusively on ocean sustainability by prohibiting certain forms of harmful fisheries subsidies, which are a key factor in the widespread depletion of the world's fish stocks.[18]

24. Over time, certain tensions have arisen between the disciplines of the General Agreement on Tariffs and Trade and WTO and national environmental measures aimed at protecting natural resources and the environment. The interface between international trade and natural resources conservation has been addressed in several dispute settlement cases, for example, the complaint from Mexico against the United States on measures concerning the importation, marketing and sale of tuna and tuna products[19] and the complaint from India, Malaysia, Pakistan and Sri Lanka against the United States on the import prohibition of certain shrimp and shrimp products.[20]

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[16] Article XX provides the legal ground for exemptions from the World Trade Organization (WTO) rules for measures "necessary to protect human, animal or plant life or health" and "relating to the conservation of exhaustible natural resources".

[17] WTO, "Matrix on trade-related measures pursuant to selected multilateral environmental agreements", note by the secretariat.

[18] UNCTAD, *Trade and Environment Review 2023*.

[19] The United States Marine Mammal Protection Act of 1972 prohibits imports of tuna products caught with commercial fishing technology that results in the killing or serious injury of ocean mammals (e.g. dolphins) in excess of United States standards. See WTO, dispute settlement case No. DS381.

[20] Under section 609 of Public Law No. 101-162, the United States bans wild shrimp imports from countries that have not certified that their shrimp boats are equipped with so-called "turtle excluder" devices, i.e. devices with a trapdoor that allows sea turtles to escape from shrimp trawling nets. See WTO, United States – Import Prohibition of Certain Shrimp and Shrimp Products, Appellate Body report and panel report pursuant to article 21.5 of the Dispute Settlement Understanding, action by the Dispute Settlement Body, document WT/DS58/23.

25. The key question in these cases was whether restricting the market access of certain imports owing to environmental considerations could be justified under the principles of the General Agreement on Tariffs and Trade and WTO, including the principle of national treatment.[21]

26. In none of these cases were the import-restricting measures taken owing to environmental concerns found to be in violation of WTO rules. These cases have, however, given rise to questions concerning if, when and to what extent process and production methods that do not affect the final characteristics of a product could be the basis for discrimination against otherwise homogeneous products in the multilateral trading system.

Negotiations on environmental goods within the World Trade Organization

27. Under the Doha Development Agenda, WTO members were instructed to begin negotiations with the aim of reducing or eliminating tariffs and non-tariff barriers on environmental goods and services.[22] However, the members have not been able to reach an agreement on the list of products and services that would be subject to market liberalization.

28. The plurilateral Environmental Goods Agreement is another forum for negotiations on trade liberalization for environmental goods, which began in 2014 but not in a multilateral framework. The negotiations involved 18 participants, including the European Union, and were aimed at reducing tariffs on goods designed to protect the environment and support the transition to renewable energy. However, the negotiations stalled in 2016 owing to the lack of consensus on the list of environmental goods to be covered by the Agreement.

29. In November 2020, 50 WTO members launched the Trade and Environmental Sustainability Structured Discussions to advance members' discussions at the intersection of trade and the environment and complement the work of the WTO Committee on Trade and Environment.[23, 24] Under the Discussions, which are currently sponsored by 74 WTO members, there are four informal working groups covering: (a) climate measures; (b) subsidies; (c) environmental goods and services; and (d) the circular economy.

Negotiations on environmental goods under bilateral and regional trade agreements

30. While progress has been slow in multilateral trade negotiations, the uptake of environmental concerns in regional trade agreements has gained traction. Most regional trade agreements signed since 2000 have included provisions related to environmental sustainability. Of the 270 regional trade agreements in force in 2016, 93 per cent had at least one provision referring explicitly to the environment.[25] In some regional trade agreements, the parties either reaffirm their commitments to implementing obligations established by specific multilateral environmental

[21] The principle of national treatment is the principle of giving products or services from other countries the same treatment as one's national products or services. Article III of the General Agreement on Tariffs and Trade requires that imports be treated no less favourably than the same or similar domestically produced goods once they have passed customs (WTO, "National treatment", WTO Glossary).

[22] WTO, Ministerial Declaration adopted at the fourth WTO Ministerial Conference, held in Doha from 9 to 14 November 2001.

[23] WTO, "Trade and environmental sustainability".

[24] WTO, Communication on trade and environmental sustainability, document WT/CTE/W/249.

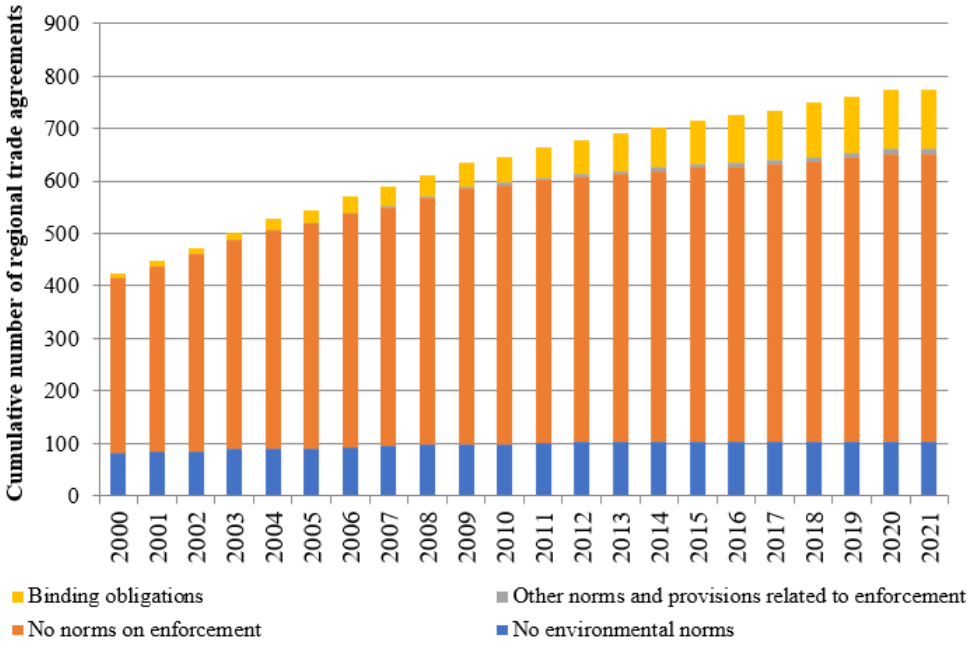
[25] WTO, "Typology of environment-related provisions in regional trade agreements", WTO Working Paper ERSD-2016-13.

agreements or are required to adhere to specific multilateral environmental agreements to benefit from the regional trade agreement.[26]

31. Although many regional trade agreements do not contain norms on the enforcement of national environmental laws and regulations, there is a trend towards the inclusion of binding obligations. The share of regional trade agreements containing such norms rose from 2 per cent in 2000 to 15 per cent in 2021 (see figure VIII).[27]

32. Environmental norms are particularly prevalent in regional trade agreements between developed and developing countries (North-South), while the use of environmental norms is more muted in agreements between developing countries (South-South) and between developed countries (North-North) (see figure IX). Some regional trade agreements, such as the Free Trade Agreement between the European Union and Singapore, set out specific trade and sustainable development commitments related to fossil fuel subsidies, thereby encouraging the parties to consider the need to reduce greenhouse gas emissions and limit trade distortions when developing public support systems for fossils fuels.

Figure VIII
Provisions on the enforcement of national environmental laws in regional trade agreements

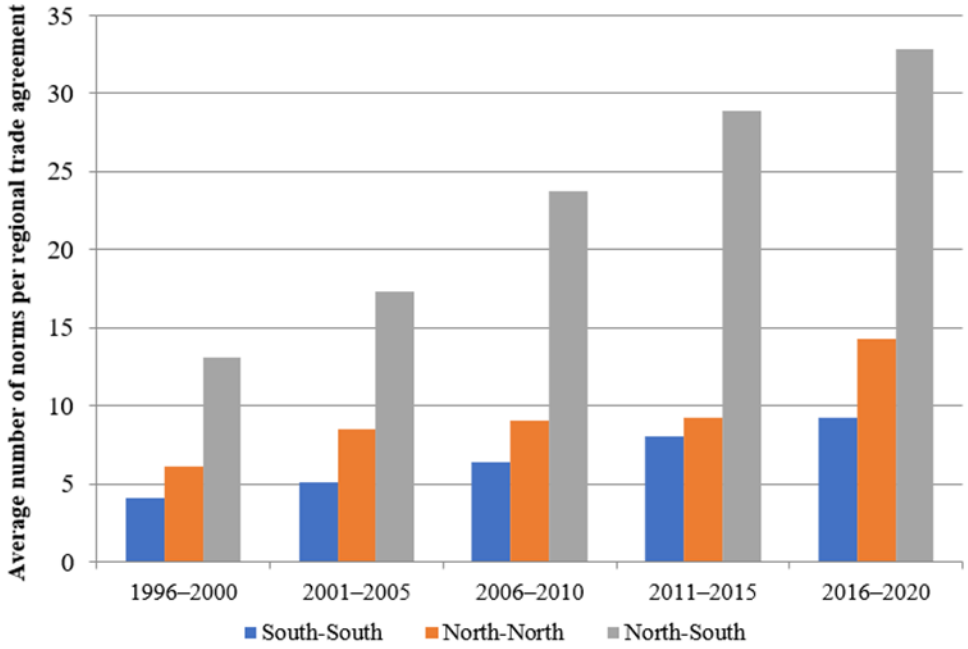


Source: UNCTAD, *Key Statistics and Trends in Trade Policy 2022*.

[26] Adhering to multilateral environmental agreements may also be suggested in certain trade preference programmes, such as the Generalized System of Preferences schemes. Under a Generalized System of Preferences programme of the European Union, duty-free preferential tariff treatment is offered on more than two thirds of tariff lines if an eligible country commits itself to implementing 27 international conventions addressing issues such as labour and human rights, environmental and climate protection, and good governance. This framework, called Generalized System of Preferences Plus, is currently provided to seven developing countries, namely: Bolivia (Plurinational State of), Cabo Verde, Kyrgyzstan, Mongolia, Pakistan, Philippines and Sri Lanka.

[27] UNCTAD, *Key Statistics and Trends in Trade Policy 2022*.

Figure IX
Environmental norms in regional trade agreements by direction of trade



Source: UNCTAD, *Key Statistics and Trends in Trade Policy 2022*.

B. Potential tensions between environmental concerns and the trading system in the coming years

33. Government interventions in support of decarbonization directly and indirectly influence the trading environment. For many years, Governments have been implementing a substantial number of climate change-related non-tariff measures with a view to reducing greenhouse gas emissions from traded goods, imposing energy efficiency requirements, promoting sustainable forest management, ensuring the quality of renewable energy-related equipment and restricting the use of plastics.[28] Technical regulations, import and export licensing and prohibitions for environment protection purposes, and labelling schemes appear to be the most prevalent.[29] The estimated trade costs related to non-tariff measures are around 1.5 per cent of the import value for green goods.

34. While these regulatory measures offer incentives for the adoption of stricter environmental standards, there is a risk of businesses moving carbon-intensive activities from countries with stricter environmental regulations to countries with less stringent ones. Trade policy measures may be used to prevent carbon leakages.[30] For example, the European Union carbon border adjustment mechanism puts a price on the carbon dioxide emitted during the production of carbon-intensive goods imports to encourage cleaner industrial production outside the Union. The mechanism applies to imports of goods whose production is considered to be carbon intensive and at

[28] UNCTAD, *Making Trade Work for Climate Change Mitigation: The Case of Technical Regulations* (2022).
[29] Ibid.
[30] Carbon leakage refers to stricter emissions policies in one country triggering an increase in emissions in less regulated countries due to the relocation of polluting activities.

significant risk of carbon leakage, such as cement, iron, steel, aluminium, fertilizers, electricity and hydrogen.

35. Before the European Union issued its Directive on the carbon border adjustment mechanism, UNCTAD had estimated that, with a $44 per ton carbon tax, leakage was cut by more than half, from 13.3 to 5.2 per cent, suggesting that the mechanism was potentially an effective instrument for reducing carbon leakage.[31] UNCTAD also estimated that, with a $44 per ton carbon tax, the income of developing nations would fall by $5.9 billion, while that of developed countries would rise by $2.5 billion. The effects on international trade would depend mostly on trade patterns, the carbon intensity of production processes and the carbon policies of each trading partner. Recent estimates indicate that, if the carbon border adjustment mechanism were extended to all products covered by the European Union Emissions Trading System, up to $16 billion of developing country exports could face additional charges.[32]

Possible conflicts between energy transition support measures and the international trading system

36. In addition to existing non-tariff measures in support of decarbonization, national Governments, especially in advanced economies, increasingly turn to "green industrialization" policy packages, using government spending and fiscal incentives to sustain economic growth within decarbonization and energy transition constraints.[33] Most such policy packages place specific focus on energy transition. Feed-in tariffs are a measure to support renewable electricity producers, including businesses and homeowners, by providing them with guarantee of purchase of renewable electricity, often at a premium price. Already in 2016, feed-in tariffs were being used by 83 countries, half of which were developing countries, including China and Malaysia.[34,35]

37. Some sustainable policy packages have combined feed-in tariffs with local content requirements, for instance by requiring renewable electricity producers to use domestically manufactured products or domestic services.[36] If feed-in tariffs are implemented by themselves, there is little friction with the WTO principle of not discriminating against imported products and services.[37] However, when a feed-in tariff is conditional on local content requirements, it can become a subsidy that may be actionable under the Agreement on Subsidies and Countervailing Measures or the Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994.

38. In the past 10 years, nine cases concerning renewable energy support measures have been brought to WTO. Unilateral countervailing (and anti-dumping) duty actions were also taken against renewal energy products[38] benefiting from government

[31] UNCTAD, "A European Union carbon border adjustment mechanism: implications for developing countries", April 2021.

[32] Sam Lowe, "The EU's carbon border adjustment mechanism: how to make it work for developing countries", Centre for European Reform.

[33] For example, the European Union Green Deal Industrial Plan (2020); the Infrastructure Act, the Creating Helpful Incentives to Produce Semiconductors and Science Act and the Inflation Reduction Act of the United States; and the Made in China 2025 plan.

[34] See www.iea.org/policies/5545-feed-in-tariff-support-for-solar-pv.

[35] See www.seda.gov.my/reportal/fit/.

[36] OECD, "Local content requirements impact the global economy".

[37] See, for instance, WTO, Canada – Measures relating to the Feed-In Tariff Programme, dispute settlement case No. DS426; Canada – Certain Measures Affecting the Renewable Energy Generation Sector, dispute settlement case No. DS412; and India – Certain Measures relating to Solar Cells and Solar Modules, dispute settlement case No. DS456.

[38] See, for instance, WTO, United States – Countervailing Duty Measures on Certain Products from China, dispute settlement case No. DS437.

subsidies of importing countries.[39] All but one case involved local content requirement clauses used with the aim of developing a local industry of targeted products.[40]

39. At the same time, there has been an increase in export restrictions on strategic raw materials needed for energy transition. Such restrictions, including export taxes or quotas, may lower domestic prices, but they also invite critical mineral-producing countries to introduce similar restrictions.[41] Between 2009 and 2020, the number of measures affecting critical raw materials grew more than fivefold, from 2,518 to 13,102.[42]

40. The question to Governments today is how to balance the multilateral trade rules with climate change imperatives. On the one hand, the disciplines of the General Agreement on Tariffs and Trade and WTO may stand in the way of Governments wanting to support domestic producers and suppliers of, for example, renewable energy, using measures such as local content requirements.

41. On the other hand, those disciplines can regulate trade practices such as export restrictions that may hinder access to goods and services necessary for renewable energy transition. The WTO members have sought to secure adequate policy space to cater for climate actions in areas such as subsidies, trade-related investment measures, trade-related intellectual property rights and the transfer of technology.[43]

42. For example, in article 66, paragraph 2, of the Agreement on Trade-Related Aspects of Intellectual Property Rights, developed countries are called upon to "provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least developed country members in order to enable them to create a sound and viable technological base". This constitutes tangible help for least developed countries, which are seriously lacking investment in research and development for more sustainable industrial activities. Since 2000, low-income countries have spent only 0.2 per cent of their gross domestic product on research and development, compared with 2.2 to 2.4 per cent for high-income countries (see figure X). In monetary terms, the research and development spending of high-income countries in 2020 (around $1.4 trillion) was about 1,000 times greater than that of low-income countries. However, it has been difficult to monitor the implementation and effectiveness of article 66, paragraph 2, of the Agreement.

43. Sustainable industrialization and a fair and equitable trading system do not have to be mutually exclusive. Achieving coherence between a sustainable environment and sustained trade is particularly important for developing countries. Finding a good balance may require thinking outside the box. UNCTAD could be a platform for discussions on repurposing global fossil fuel subsidies to bridge the investment gap

[39] Henok Asmelash, "The first ten years of WTO jurisprudence on renewable energy support measures: has the dust settled yet?", World Trade Review, vol. 21, No. 4 (October 2022).

[40] For instance, in the Canada – Certain Measures Affecting the Renewable Energy Generation Sector dispute, Canada implemented a feed-in tariff programme for renewable energy with preferences for national products to support the national renewable energy industry. Similarly, in the India – Certain Measures relating to Solar Cells and Solar Modules dispute, India imposed domestic content requirements on solar power developers selling electricity to the Government.

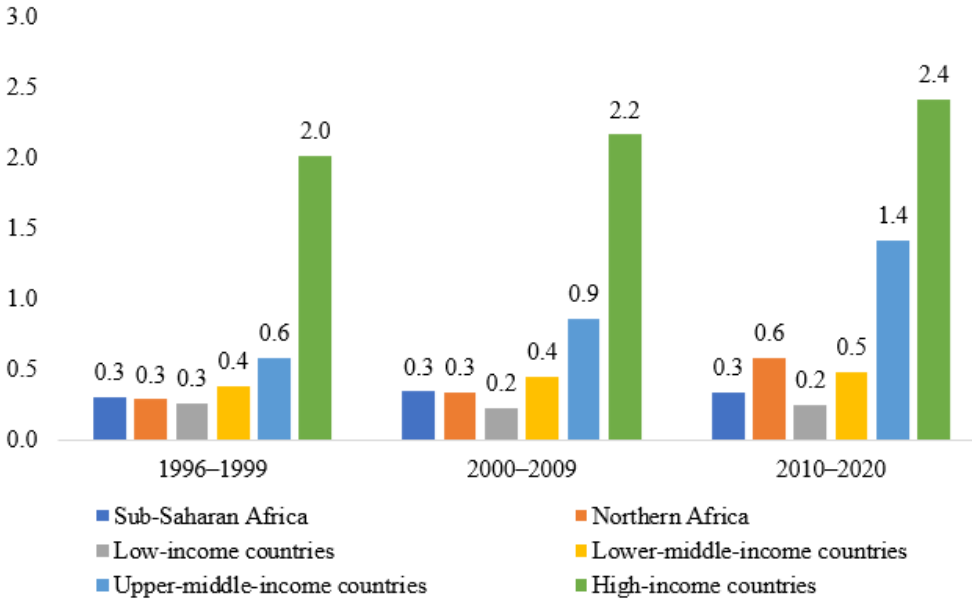
[41] OECD, *Raw Materials Critical for the Green Transition: Production, International Trade and Export Restrictions*.

[42] The countries with the highest incidence of export restrictions are China, India, the Russian Federation, Argentina and the Democratic Republic of the Congo (OECD, *Raw Materials Critical for the Green Transition: Production, International Trade and Export Restrictions*).

[43] WTO, Policy space for industrial development: a case for rebalancing trade rules to promote industrialization and to address emerging challenges such as climate change, concentration of production and digital industrialization, document WT/GC/W/868.

that developing countries are facing in meeting climate change mitigation and adaptation objectives. The investment gap is estimated to be in the rage of $100 billion [44] and $780 billion per year, just a fraction of global fossil fuel consumption subsidies, which stood at more than $1 trillion in 2022.[45]

Figure X
Share of research and development expenditure in gross domestic product, 1996–2020 (percentage)



Source: UNCTAD calculations based on the United Nations Educational, Scientific and Cultural Organization database.

IV. Efforts to improve complementarity between trade policy and environmental concerns

44. Under article 4, paragraph 2, of the Paris Agreement, each Party is required to prepare, communicate and maintain successive nationally determined contributions for reducing national carbon dioxide emissions and mitigating the impacts of climate change. As of September 2022, 166 nationally determined contributions had been submitted by 193 parties to the Agreement, covering 94.9 per cent of global greenhouse gases emissions.[46]

45. When paired with sound environmental policies, low trade barriers and well-functioning institutions, international trade can be an engine for progress in climate adaptation and mitigation.[47] Coordination should be increased among countries and under international and multilateral agreements to make the trading system a much-needed lever to strengthen climate and related biodiversity and pollution actions.

[44] Standing Committee on Finance of the United Nations Framework Convention on Climate Change, *Report on Progress towards Achieving the Goal of Mobilizing Jointly USD 100 Billion Per Year to Address the Needs of Developing Countries in the Context of Meaningful Mitigation Actions and Transparency on Implementation* (Bonn, 2022).

[45] See www.iea.org/reports/fossil-fuels-consumption-subsidies-2022.

[46] FCCC/PA/CMA/2022/4, FCCC/PA/CMA/2022/4/Corr.1 and FCCC/PA/CMA/2022/4/Corr.2.

[47] WTO, “Trade and climate change: overview of trade policies adopted to address climate change”, information brief No. 1, 2021.

46. The integration of international trade into the national determined contributions framework as a means of implementation, jointly with finance, technology and capacity-building, would support national efforts to shape the trading system in this way.

Trade policy to support the implementation of nationally determined contributions

47. In the nationally determined contributions of developing countries, trade measures are found mainly under standards for importing vehicles and appliances, with trade-restrictive measures used to limit imports of appliances or vehicles that do not comply with specific pollution standards. Other measures include efficiency standards, labelling standards and timber trade regulations. Aligning trade policy and trade agreements with the implementation of nationally determined contributions will be essential for success.

48. The integration of developing countries into emerging sustainable value chains is an issue of high priority, especially for countries dependent on fossil fuels and other commodities exports. Any trade policy interventions by developed economies in support of their sustainable industrialization may be coupled with actions that facilitate climate change mitigation and adaptation for developing countries, such as technology transfer and measures to fill the gap in climate finance.

Harmonization of the relationship between trade and the environment

49. There is a clear need for supply-side capacity improvements for renewable energy, the substantial transfer of zero- and low-emissions technologies, and the expansion of environmental and infrastructure services for the decarbonization of global and regional value chains. Multilateral, regional and bilateral trade agreements need to support the attainment of nationally determined contributions and climate goals. This requires assessment of current multilateral trade disciplines in relation to the implementation of nationally determined contributions and other multilateral environmental agreements, and reforms to better align the multilateral trade architecture with the imperative to protect both people and the planet.

50. Certain degrees of policy space already exist within the multilateral trading system without the need to challenge WTO rules, including adjustments to tariff rates within the WTO bound rates; investment performance requirements linked to technology transfer, skill-building and local labour; public procurement preferences for green domestic production; and the effective use of competition and consumer policy. However, in some cases, such as those related to local content requirements, WTO members may be required to distinguish between climate actions that should not be subject to the existing multilateral trade disciplines and those that should.

51. Certain civil society organizations have proposed a “climate peace clause” at WTO, which is “a time-bound, self-enforcing commitment from Governments to refrain from using dispute settlement mechanisms in international trade agreements to challenge other countries’ climate mitigation and/or clean energy transition measures”.[48] Such a framework could facilitate the implementation of nationally determined contributions. However, an all-encompassing climate peace clause ultimately advantages high-income countries with the fiscal capacity to support the decarbonization of their industries. The public debt burden of developing countries is currently 68.3 per cent of their gross domestic product. Internal budgetary allocations for energy transition compete with other priorities such as health, education and post-disaster recovery. Channelling subsidies for energy transition involves financial

[48] Trade Justice Education Fund and Sierra Club, “The case for and a design of a climate peace clause”, discussion paper, 2022.

efforts that many countries cannot make without further investment given the current reality of high interest rates and high inflation.[49] Developing countries, in particular low-income ones, would need concrete measures, including the transfer of technology, to build climate-resilient infrastructure and strengthened capacities for integration into low-carbon value chains. For instance, UNCTAD found that the rise in demand for specific inputs and supply sources for the low-carbon transition and green mobility is likely to generate economic and business opportunities in many low-income developing countries that are low emitters of carbon.[50] Policies and measures conducive to the decarbonization of industries and the greening of supply chains in developing countries will be critical.

52. The United Nations system is uniquely positioned to support countries in identifying the key parameters to help national Governments to achieve their ambitious environmental and social commitments. UNCTAD, as the United Nations focal point for the integrated treatment of development and interrelated issues in trade, finance, investment, technology and sustainable development, is a forum for policymakers to exchange ideas and experiences in achieving the nexus between trade and the environment for sustainable development.

V. Conclusion and recommendations

53. **The global trade and climate policy regimes are increasingly interconnected. However, this growing interconnectedness has not been accompanied by effective policy coordination among decision makers in the climate and trade domains both within and across countries.**

54. **To strengthen the nexus between trade and the environment, coherence is needed at three levels: nationally, between a country's trade strategy and its nationally determined contribution; among countries, in reducing or eliminating friction between the necessary climate actions and the multilateral trade disciplines; and within the multilateral system, for example, under the multilateral trade rules and multilateral and international conventions related to environmental sustainability, to create a global economic environment that enables the sustainable structural transformation of developing countries.**

55. **To achieve a coherent nexus between trade and the environment, Member States may wish to consider the following recommendations:**

(a) **Increase economic resilience and reduce commodity dependence through low-carbon industrialization, expand existing productive capacities and establish new ones, and improve physical and social infrastructure;**

(b) **Mobilize climate adaptation and other development finance to mitigate the fiscal impact of the shift from high-carbon production;**[51]

(c) **Align national objectives with those of the United Nations Framework Convention on Climate Change and the Paris Agreement to facilitate structural transformation;**

(d) **Give priority to investments for a sustainable structural transformation, such as investments in infrastructure, national**

[49] UNCTAD, "A World of Debt" dashboard.

[50] UNCTAD, *Economic Development in Africa Report 2023: The Potential of Africa to Capture Technology-Intensive Global Supply Chains* (Geneva, 2023).

[51] UNCTAD, *The Least Developed Countries Report 2022: The Low-Carbon Transition and its Daunting Implications for Structural Transformation* (Geneva, 2022).

entrepreneurship policies, the acquisition and adoption of technology related to energy transition, research and development, and the upskilling of workers;

(e) **Leverage South-South cooperation and regional integration as a vehicle for green industrialization. In general, South-South cooperation beyond the regional sphere can also provide a boost to the low-carbon transition in least developed countries, especially by means of financing, technical cooperation and capacity-building;**[52]

(f) **Enhance South-South trade cooperation through regional trade agreements, such as the Agreement Establishing the African Continental Free Trade Area, or interregional trade arrangements, such as the global system of trade preferences among developing countries;**[53]

(g) **Address the barriers that might be imposed by the environmental policies of developed economies on least developed countries in terms of market access or development finance;**

(h) **Base trade policy measures for emissions reduction on the principle of the United Nations Framework Convention on Climate Change of common but differentiated responsibilities and respective capabilities, and respect the transition timetables established in the nationally determined contributions of developing and least developed countries;**

(i) **Ensure that the lower carbon footprint of most developing countries is taken into account in the environmental policies of developed economies;**

(j) **Take urgent steps to strengthen the role of the United Nations Framework Convention on Climate Change in technology transfer through enhanced international support measures, such as the implementation of article 66, paragraph 2, of the Agreement on Trade-related Aspects of Intellectual Property Rights to operationalize the technology transfer provisions of the Convention with respect to decarbonization-related technologies;**

(k) **Enhance multilateral coherence in the integration of developing countries into emerging sustainable value chains, ensure that mineral-rich developing countries leverage the development opportunities offered by the increased demand for minerals for the low-carbon transition, and help fossil fuel-exporting countries to avoid the risk of stranded assets;**

(l) **Improve the fairness and transparency of the international trading system, avoid incentives that cause races to the bottom, and strengthen institutions through technical and capacity-building activities and enhanced international coordination;**

(m) **Secure funding for long-term sustainable development targets, including by shifting fossil fuel subsidies to renewable energy initiatives;**

(n) **Call for increased investment in technology, innovation and digital solutions to guarantee productive capacities to fully exploit the benefits of the energy transition.**

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[52] Ibid.

[53] The global system of trade preferences among developing countries is a comprehensive and agile partnership framework for South-South trade cooperation that allows developing countries to take concerted action to address tariffs, non-tariff measures and direct-trade measures on a horizontal or sectoral basis. Its unique structure offers the opportunity to deepen South-South cooperation to address contemporary global challenges such as decarbonization.