

WTO's contribution to attaining UN Sustainable Development Goals: 2023 update to the High-Level Political Forum



Acknowledgments

This publication received guidance from Deputy Director-General Xiangchen Zhang and from Yuwan Beedjadhur of the Office of the Director-General. Preparation of the publication was a joint effort across several divisions of the WTO.

Raúl Torres, Head of the Development Policy Unit of the Development Division conceptualized, and directed the project. Roberta Allport, also from the Development Policy Unit, was the project coordinator. The publication was edited and reviewed by Helen Swain of the Information and External Relations Division.

Contributing authors to this publication were Raúl Torres, Roberta Allport and Magdaline Morijoi (Development Division); Ruosi Zhang, Ester Rubio Colomer, Ayushi Singh and Martin Roy (Trade in Services and Investment Division); Sajal Mathur, Ludivine Tamiotti and Svetlana Chobanova (Trade and Environment Division); Josefita Pardo de León, Mengqi Niu, Antony Taubman, Carol Cravero and Reto Malacrida (Intellectual Property, Government Procurement and Competition Division); Roberta Piermartini, Ankai Xu, Stela Rubínová and Jose-Antonio Monteiro (Economic Research and Statistics Division).

Disclaimer

This publication has been prepared under the WTO Secretariat's own responsibility and without prejudice to the position of WTO members and to their rights and obligations under the WTO. The designations employed in this publication and the presentation of material therein do not imply the expression of any opinion whatsoever on the part of the WTO concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers.



CONTENT

Introduction	4
The 2023 High-Level Political Forum and the WTO	4
Overview of international trade between 2022 and 2023 and projections for the future	4
WTO contributions to recovery from COVID-19 and future pandemics	7
SDG 6: Clean Water and Sanitation	8
Trade policies and trade measures for water conservation and management	8
Water supply and sanitation services	9
The UN 2023 Water Conference and the Global Commission on the Economics of Water	9
International trade in water	10
SDG 7: Affordable and Clean Energy	11
Trade is increasingly shaping the clean energy landscape	11
Addressing trade barriers in clean and renewable energy	12
International trade cooperation can speed up access to affordable clean energy worldwide	13
SDG 9: Industry, Innovation and Infrastructure	15
Government policies to promote innovation and sustainability	15
Examples of WTO initiatives that facilitate innovation	17
The role of intellectual property and the WTO TRIPS Agreement in innovation	17
Policies of micro, small and medium-sized enterprises	20
The role of the Agreement on Government Procurement (2012) in infrastructure development	20
The role of Aid for Trade in SDG 9	21
The geographical distribution of Aid for Trade	22
Strengthening multilateral cooperation on industrial subsidies	24
SDG 11: Sustainable Cities and Communities	26
The role of tourism and services in supporting the development of sustainable cities	26
Measuring the sustainability of tourism	27
The role of investment facilitation for development in the tourism sector	27
The role of trade in promoting sustainable cities	28
The WTO Trade Facilitation Agreement and sustainable cities	28
SDG 17: Partnerships for Trade and development	30
References	31
Endnotes	33

Introduction

The 2023 High-Level Political Forum and the WTO

The UN's High-Level Political Forum (HLPF), held annually, offers organizations, including the WTO, the opportunity to review progress towards the attainment of the UN Sustainable Development Goals (SDGs). In the case of the WTO, this involves examining the contribution of international trade and the multilateral trading system to attainment of the SDGs and to development in general.

The 2023 HLPF will focus particularly on Goal 6 ("Clean water and sanitation"), Goal 7 ("Affordable and clean energy"), Goal 9 ("Industry, innovation and infrastructure"), Goal 11 ("Sustainable cities and communities") and Goal 17 ("Partnerships for the goals"). The HLPF will also take into account the different and particular impacts of the COVID-19 pandemic across these SDGs and the integrated, and interlinked nature of the SDGs.

The HLPF process therefore gives the WTO the opportunity to delve into SDGs where connections with trade have not been examined in detail up to now.

Overview of international trade between 2022 and 2023 and projections for the future

The WTO's recent "Global Trade Outlook and Statistics" report (WTO, 2023a) showed that, due to strong external pressures, 2023 projections for trade and output growth are below the respective averages of 2.6 per cent and 2.7 per cent for the 12 years since the trade collapse that followed the global financial crisis. The WTO recognizes the important role that trade must play in the economic recovery from the COVID-19 pandemic and the need for decisive positive action on multilateral trade; as WTO Director-General Okonjo-Iweala stated during the launch of the "Global Trade Outlook and Statistics":

"Trade continues to be a force for resilience in the global economy... This makes it even more important for governments to avoid trade fragmentation and refrain from introducing obstacles to trade. Investing in multilateral cooperation on trade... would bolster economic growth and people's living standards over the long term."

The report projects merchandise trade volume growth of 1.7 per cent in 2023, accompanied by real GDP growth of 2.4 per cent at market exchange rates (see Figure 1). However, this projected merchandise trade volume growth is, in fact, an upwards revision from the previous estimate of 1.0 per cent made by the WTO in October 2022, and is due to the relaxation of COVID-19 pandemic controls in China, which is expected to unleash pent-up consumer demand in the country, resulting in a boost to international trade.

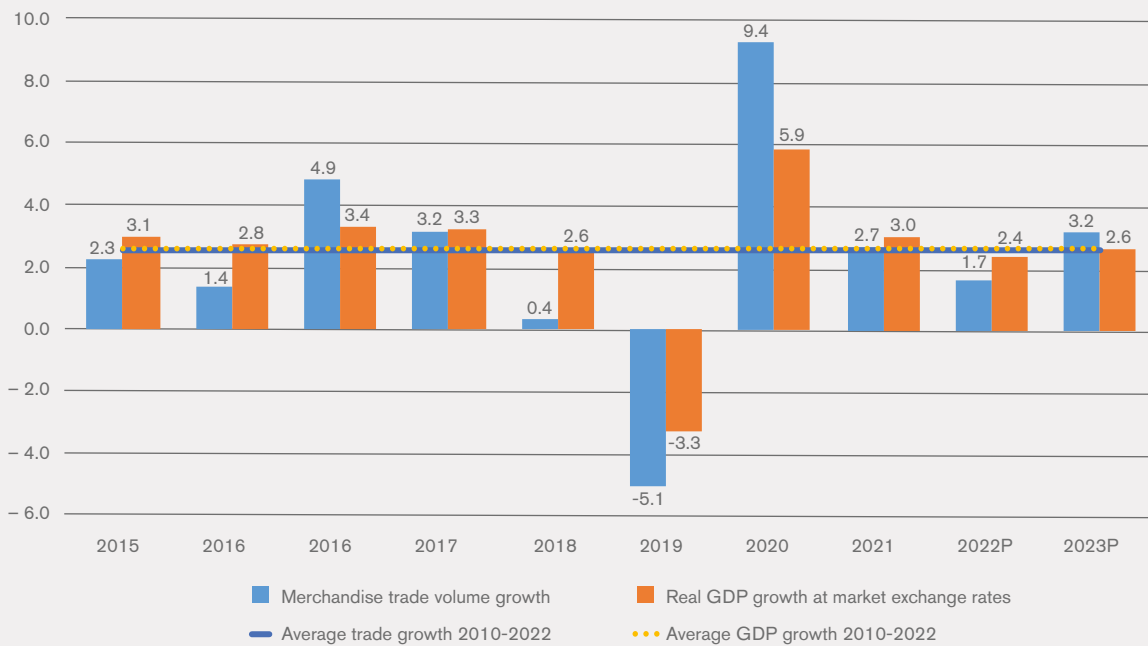
The report also shows that goods trade was more resilient than expected for most of 2022, despite the effects of the war in Ukraine. Year-on-year merchandise trade volume growth averaged 4.2 per cent in the first three-quarters of 2022, before a sharp quarter-on-quarter decline in the fourth quarter dragged growth for the year down to 2.7 per cent. Several factors contributed to that slump, including elevated global commodity prices, monetary policy tightening in response to inflation, and outbreaks of COVID-19 that disrupted production and trade in China.

Trade growth in 2022 was in line with the 2.4 to 3.0 per cent baseline scenario predicted by the WTO's March 2022 report on the war in Ukraine (WTO, 2022a), which was well above a more pessimistic scenario in which the formation of competing economic blocs would have resulted in trade growth of 0.5 per cent. Instead, as a result of continued open markets, many vulnerable countries were able to compensate for increased food prices and reduced supply by turning to alternative products and suppliers (WTO, 2023b).

Looking ahead to 2024 (see Figure 2), a rebound of trade growth to 3.2 per cent is projected, as GDP picks up to 2.6 per cent. However, this estimate is more uncertain than usual due to the presence of a number of significant risks, including geopolitical tensions, resurgent inflation, food supply shocks and the possibility of unforeseen effects resulting from monetary tightening. Interest rate hikes in advanced economies have also revealed weaknesses in banking systems that could lead to wider financial instability unless addressed by governments and regulators. The outcome of the worst-case scenario continues to be a food crisis that could trigger widespread hunger and, potentially, political instability in low-income countries.

Inflation and commodity prices were also among the main drags on trade and GDP in 2022 (see Figure 3). Coupled with an appreciation of the US dollar, inflation rates in 2022 were among their highest since the 1980s, strongly influenced by massive commodity price fluctuations, which also affected 2022 trade volumes.

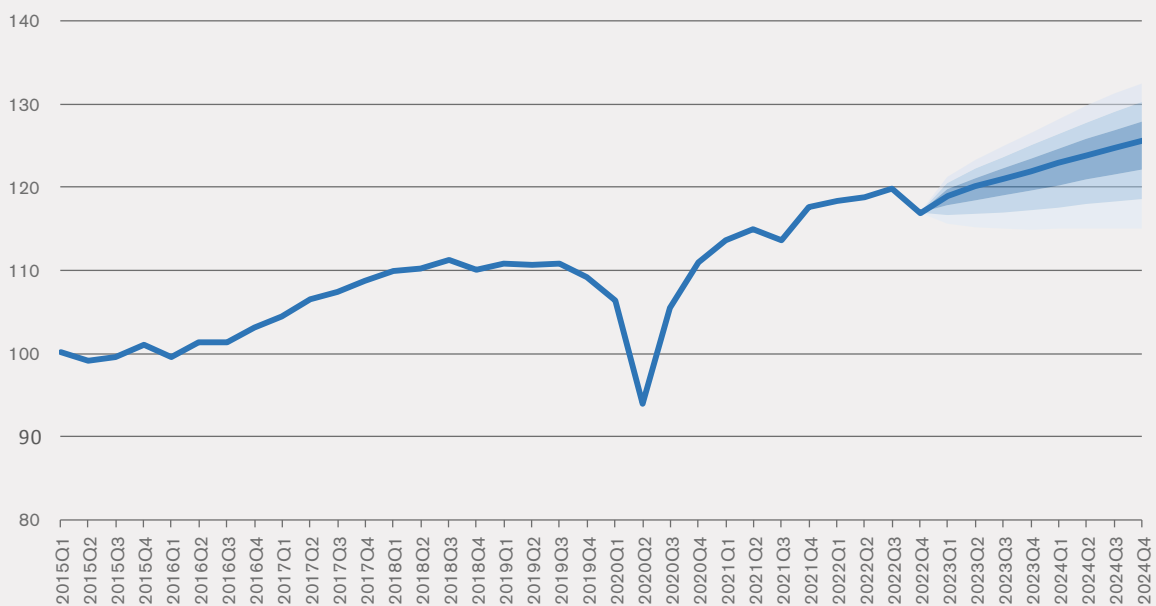
Figure 1: World merchandise trade volume and GDP growth, 2015-24
Annual % change



Note: 2023 and 2024 are projections.

Source: WTO for merchandise trade volume and consensus estimates for GDP (WTO, 2023a).

Figure 2: Volume of world merchandise trade, 2015Q1-2024Q4
Seasonally adjusted volume index, 2015=100



Note: The shaded region represents both random variation and subjective assessment of risk.

Sources: WTO and UNCTAD for historical data, WTO Secretariat estimates for forecasts and WTO (2023a).

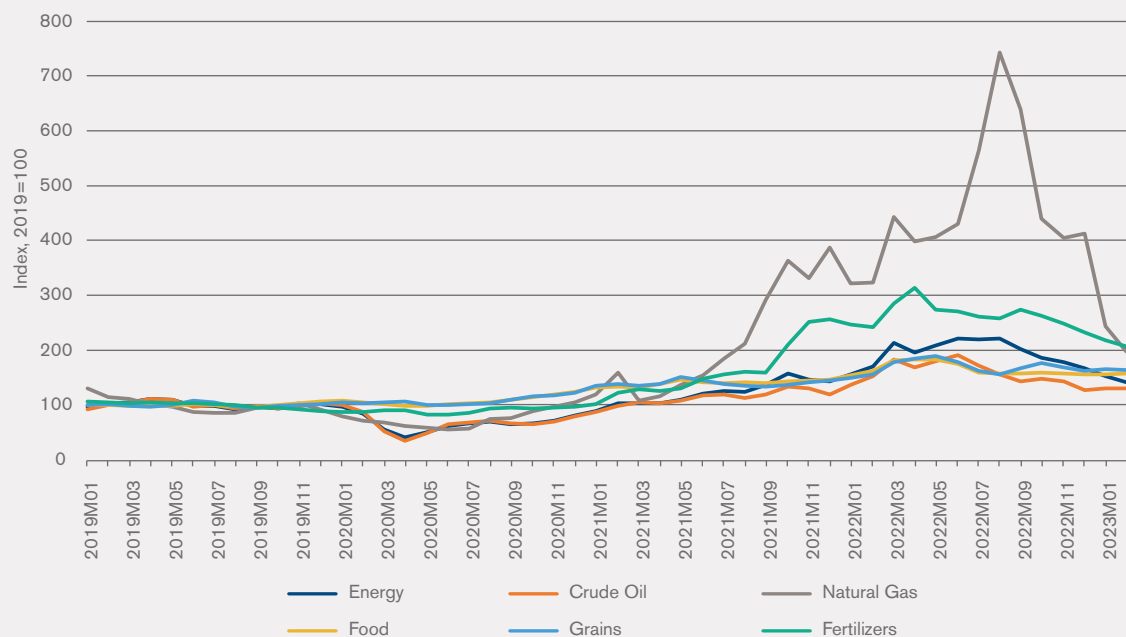
These fluctuations were particularly strong for European natural gas prices, which rose 48 per cent between January and August 2022, before falling 76 per cent by February 2023. Prices of food commodities also underwent wide variations over the course of 2022, surging by 19 per cent between January and May, before plunging 15 per cent between May and December. Prices of fertilizers registered an even larger year-on-year increase of 63 per cent.

The COVID-19 pandemic was also responsible for a dramatic reduction in international trade, resulting in depressed GDP growth, particularly in 2020 (see Figure 1). Conversely, international trade has played a critical role in accelerating the economic recovery from the pandemic in a number of ways:

- The pandemic created a surge in demand for goods such as masks, ventilators and personal protective equipment. International trade helped to ensure that these essential medical supplies and equipment were available in the countries that needed them most, even when domestic production was unable to meet the demand.
- International trade played a critical role in the transport of COVID-19 vaccines and related medical supplies to countries in need, including low-income economies lacking resources to develop or purchase vaccines.

- The pandemic disrupted global supply chains, causing shortages and delays in the delivery of goods and services. International trade helped to maintain these supply chains and ensured that essential goods and services continued to flow despite disruptions.
- The pandemic caused a significant downturn in global economic activity, leading to widespread job losses and business closures. International trade helped to support economic recovery by enabling businesses to access new markets, offsetting the impact of reduced domestic demand.
- International trade helped to facilitate global collaboration and cooperation in addressing common challenges by enabling the sharing of knowledge, expertise and resources across borders and by promoting international dialogue and cooperation.

Figure 3: Global average primary commodity prices, January 2019 - February 2023



Source: World Bank and WTO (2023a).

WTO contributions to recovery from COVID-19 and future pandemics

The WTO's work has been instrumental in creating conditions favouring the recovery of international trade and economies from the COVID-19 pandemic. An important example is the WTO's 12th Ministerial Conference (MC12), held in June 2022 following a delay of over two years due to the pandemic.

The Conference resulted in two outcomes specifically related to trade responsiveness to pandemics, namely, the Ministerial Declaration on the WTO Response to the COVID-19 Pandemic and Preparedness for Future Pandemics² and the Ministerial Decision on the Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS Agreement).³

The Ministerial Declaration on the WTO Response to the COVID-19 Pandemic and Preparedness for Future Pandemics resulted from work by WTO members on a holistic multilateral response to the pandemic, which would also take into account future pandemics. This Declaration is solutions-oriented and, for example, will enable members to better leverage the knowledge generated by the networks established by WTO Director-General Okonjo-Iweala in order to coordinate discussions among relevant international organizations, development agencies, civil society and businesses. The declaration calls upon relevant WTO bodies to continue or initiate work on lessons learned and challenges

experienced during the pandemic. Areas of focus include export restrictions, food security, intellectual property, regulatory cooperation, services, tariff classification, technology transfer, trade facilitation and transparency. A yearly stocktaking exercise will take place in the General Council up to the end of 2024.⁴

The Ministerial Decision on the TRIPS Agreement provides a platform for members to work together to diversify vaccine production capacity. It allows members greater scope to take direct action to override the exclusive effect of patents through a targeted waiver that addresses specific problems identified during the pandemic, especially facilitating and streamlining vaccine exports for the next five years and greater clarity regarding emergency use measures. Developing-economy members with existing COVID-19 vaccine manufacturing capacity are encouraged to opt out of availing themselves of the waiver. Members were also due to decide on whether to extend the waiver to cover the production and supply of COVID-19 diagnostics and therapeutics by December 2022, though this deadline has been extended.

SDG 6: Clean Water and Sanitation

KEY POINTS

- Trade can provide the means to disseminate the technologies needed for better water management. It can help to scale up solutions and spread best practices with regard to water management as goods producers connect through supply chains.
- Trade in water services can help attract the investments needed to build or maintain public water supply and sanitation utilities. Trade can also provide access to innovative and competitive technologies that increase the efficiency of sanitation and wastewater management.
- WTO Director-General Okonjo-Iweala participated in the UN Water Conference in March 2023 and is a co-chair of the Global Commission on the Economics of Water.
- While water itself is mostly not traded, indirect trade in water – particularly as embedded in traded agricultural goods – can play an important role in saving water resources and enhancing food security.

Trade policies and trade measures for water conservation and management

Water is assumed by many to be provided by nature and available to all for free, but, in reality, water access cannot be taken for granted. Water resources are distributed unevenly across the globe. Furthermore, its supply is significantly affected by climate change, deforestation, and pollution. Trade and trade policies can play a role in addressing these challenges, especially in economies most vulnerable to extreme weather events, water or food scarcity and climate shocks. As developed further in the 2022 World Trade Report, the removal of unnecessary barriers to trade could significantly augment the potential of trade, finance, investment and access to technologies, and could help reduce costs and exposure to climate-induced shocks (WTO, 2022b).

Trade can facilitate the development and deployment of goods, services and technologies, such as drought-resistant crop varieties, drip or other irrigation, and water conservation and storage systems. There is WTO interest in initiatives on environmental goods and services, and 74 WTO members are actively engaged in the Trade and Environmental Sustainability Structured Discussions. Trade in environmental products could contribute

to the diffusion of water resource management and conservation technologies and products, including the design, construction, installation or provision of technologies and products related to water supply. It may also support water pollution management technologies and products, such as those needed for wastewater treatment management and for tackling water pollution (Muller and Bellmann, 2016; WTO, 2022b).

The WTO Environmental Database (EDB)⁵ is a repository of WTO members' environment-related notifications and information drawn from their trade policy reviews.⁶ Between 2009 and 2021, 1,486 trade measures were notified and tagged in the EDB with the environment-related objective of "water conservation and management". WTO members have mostly deployed support measures, in the form of grants and non-monetary initiatives (27.1 per cent and 26.8 per cent, respectively, of the notified measures) to incentivize effective management of water resources.

With 70–80 per cent of the world's freshwater allocated to agricultural purposes, there is a strong focus on agriculture, with more than half of such trade measures for water conservation or management (52.3 per cent) notified under the WTO Agreement for Agriculture, and the rest being notified under the WTO Agreement on Subsidies and Countervailing Measures (22.8 per cent) and the WTO Technical Barriers to Trade (TBT)

Agreement (21.7 per cent) and dealing with technical specifications, standards, and conformity assessment procedures. Measures taken by developing economies and least-developed countries (LDCs) account for 43.8 per cent of the notifications tagged on water conservation and management.

The Enhanced Integrated Framework – a partnership of economies, donors and partner agencies, including the WTO, that assists LDCs – and the WTO Aid for Trade initiative include projects to help countries mobilize support and build trade-related capacities for initiatives such as climate adaptation, irrigation and water conservation and management. Examples of such projects are the provision of greenhouses and hail nets to small farmers in Lesotho to promote resilience to changing weather patterns, and mapping landslide risk and promoting sustainable soil and water management in Timor-Leste to enhance coffee-growing communities' adaptation to and preparedness for climate change (WTO, 2022b).

Thus, there is ample scope to examine how trade policy can improve the economics of water rights. In many sectors, trade distortions are also economic distortions, and there is need for coherence between trade and economic policies. Trade may also be key to adaptation as it directly – or indirectly, through trade in embedded agricultural or other products – allows for movement of water resources from areas with surplus to those facing scarcity.

Water supply and sanitation services

Services play a significant role in the sustainable management of water and sanitation, which concerns not only the supply of water services *per se*, but also various other relevant services.

Water services consist of the supply of water for consumption and the treatment of wastewater, and water supply involves the capture of the resource, its treatment to reach a determined level of quality, transportation through a primary network (aqueducts or mains) and delivery to users through a secondary network (pipelines and taps).

Wastewater services entail the removal of sewage through pipes and drains and its chemical, physical and/or biological treatment to remove contaminants and make the water content available for reuse or release into the environment. The supply of water services entails the building of infrastructure and the operation of specialized processes with complex technologies, which necessarily implicate a wide range of other services including design, engineering and construction, installation, maintenance and repair, and technical analysis and testing services.

Given that water services require costly infrastructure, most of which is laid underground and entails large, fixed costs, water services are traditionally operated by local public authorities, and the scope for the introduction of competition is more limited than for other infrastructure services, such as telecommunications. The last two or three decades have seen the increase of private investment in the water sector across the globe. The involvement of the private sector can take several forms, ranging from public-private partnerships (PPPs) to full privatization. In this context, trade in water services, in particular the supply of water services involving foreign direct investment (corresponding to mode 3 of the General Agreement on Trade in Services (GATS) modes of supply),⁷ has gained more room to develop.⁸

Developing economies facing challenges of sustainability and financial viability may consider PPPs as an option to improve their water supply and sanitation services. In this context, trade in water services can help bring in investment needed for the building or maintenance of public utilities. Trade can also provide access to innovative and competitive technologies that increase the efficiency of sanitation and wastewater management.

The UN 2023 Water Conference and the Global Commission on the Economics of Water

The UN 2023 Water Conference,⁹ which was co-hosted by the Netherlands and Tajikistan in March 2023, marked a watershed moment. Following a gap of nearly 50 years – the only previous UN Water Conference having been held in 1977 – global leaders and key policymakers engaged on water. One of the main outcomes from the UN 2023 Water Conference was the Water Action Agenda,¹⁰ which collected over 700 commitments from member states, inter-governmental organizations (IGOs), non-governmental organizations (NGOs) and other stakeholders.

WTO Director-General Okonjo-Iweala participated in the Plenary Interactive Dialogue¹¹ of the UN 2023 Water Conference on the subject of Water for Sustainable Development, as well as in a number of other high-level events.

Director-General Okonjo-Iweala also engaged with the media and with other stakeholders in her capacity as co-Chair of the Global Commission on the Economics of Water.¹² At the UN 2023 Water Conference, the Commission published its preliminary findings in “Turning the Tide: A Call to Collective Action” (Mazzucato et al., 2023), a basis for its final report, which is to be published in May 2024.

International trade in water

Water itself is mostly not traded, at least not directly in large volumes or values. There is, however, growing interest in indirect trade in water, particularly as embedded in traded agricultural goods. Among the thousands of goods traded and listed in the Harmonized System (HS) of commodity classification used to codify international trade and tariffs, only HS 2201 (*Waters, including natural or artificial mineral waters and aerated water (...); ice and snow*) is explicitly a traded product, with a merchandise export volume of 871 billion litres or 926 billion tonnes, and merchandise export value of US\$ 3.7 billion in 2020, according to the UN Comtrade Database.¹³ The top five exporters are France, China, Italy, the United States and Belgium, and the top five importers are the United States, Hong Kong (China), Belgium, Germany and Japan. Globally, the average WTO bound ceiling tariff and the actual applied tariff on beverage waters (HS 220110) are 53 per cent and 22 per cent, respectively (WTO, 2022c).

However, this trade in water does not imply that fresh water supplies are evenly distributed globally. There are economies, or regions within economies, with water scarcity, and others with water abundance. International trade could potentially help to alleviate local problems of water scarcity by moving resources to where they are most needed, but for economic, political or environmental reasons, economies may be unable or unwilling to do so. Large-scale shipments of water are essentially non-existent. Reasons for the lack of this trade are also technical, as water is bulky and difficult to transport (WTO, 2010; Temmerman, 2017).

There is also the concept of virtual water trade. In theory, trade in “virtual water” would suggest that countries facing freshwater scarcity could import more water-intensive products and export less water-intensive products. However, trading in virtual water can also enhance water inequalities if water-scarce countries decide to export water-intensive commodities themselves. It can also create the risk of maladaptation unless countries fully account for the opportunity costs of freshwater use.

The main user of freshwater is the agriculture sector, which accounts for 70–80 per cent of global water use. Importing water-intensive commodities, instead of producing them with local water, could therefore be considered as an integral part in policies that aim to increase food security and nutrition in water-constrained countries. Globally, virtual water trade could play an important role in saving water resources and enhancing food security if trade flows are directed from regions with higher water productivity to those with lower productivity. Estimates suggest that trade in agricultural products results in water saving of 369 billion cubic meters, equivalent to 4 per cent of global water use.¹⁴ Some studies show small to substantial increases in global

virtual water flows owing to trade liberalization, with increasing imports of water-intensive goods and shifts to less water-intensive activities by water-scarce regions, and increased water-intensive exports by relatively water-abundant regions (FAO, 2022). However, most studies on the relationship between international trade and national water endowments demonstrate that other factors, such as labour, capital, land endowment and access to arable land, farming structure, technology and agricultural policies are more important than water availability in determining agricultural and virtual water trade patterns (FAO, 2022).

Another limiting factor in the concept of virtual water is the fact that the price of freshwater used in agriculture or other sectors generally does not reflect its economic value, nor the environmental externalities associated with its use. This distortion can lead to sub-optimal distribution of production and international trade flows from an economic and an environmental point of view. Aligning trade and sustainable water use is therefore also critical in order to improve global water governance.

SDG 7: Affordable and Clean Energy

KEY POINTS

- Trade in environmental goods and services can play an important role in the transition to a low-carbon economy by supporting the development, deployment and diffusion of affordable low-carbon and energy-efficient technologies.
- Opening up trade in cleaner and renewable energy products and in energy-efficient products could raise global exports of these goods by 5 per cent by 2030. Although this would also raise the demand for energy, and thus increase carbon emissions, the elimination of tariffs and the reduction of non-tariff measures would nevertheless lead to a 0.6 per cent net reduction in global carbon emissions by 2030.
- International trade cooperation plays an important role in facilitating trade and investment in affordable and clean energy products and services. However, addressing the trade barriers that hinder the adoption and diffusion of low-carbon and energy-efficient technologies requires greater cooperation at the regional and multilateral levels.

Trade is increasingly shaping the clean energy landscape

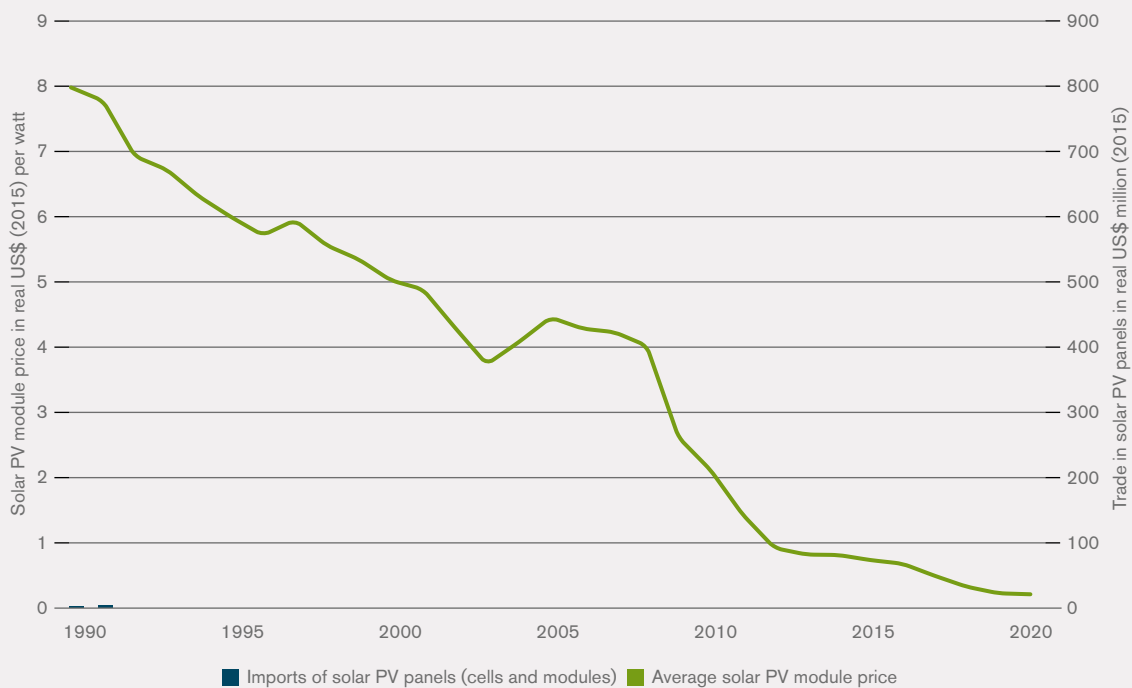
Environmental goods, services and technologies, which help to produce cleaner and renewable energy and improve energy efficiency, are critical to the transition to a low-carbon economy. Locally generated renewable energy can allow developing and least-developed economies to bypass many of the logistical difficulties and high costs involved in the transmission and distribution of fossil fuel energy, improving their energy access and reducing their dependence on energy imports. The clean energy industry is a dynamic and fast-growing sector, although it is still emerging in many countries. The scope of goods and services related to clean energy and energy efficiency is broad and includes equipment and technologies that produce wind, solar, hydro, geothermal and biomass energy, that minimize energy use and that improve heat and energy management.

Trade promotes the development and adoption of clean and renewable energy equipment and of energy-efficient goods and services. Based on an illustrative list, it is estimated that global trade

in renewable energy equipment and products grew by over 180 per cent between 2000 and 2020, outpacing the annual growth rate of overall merchandise trade.

Economies of scale, innovation, and the rise of global value chains drive improvements in many low-carbon technologies. For example, improvements in technology and production have driven down the cost of solar electricity by 97 per cent since 1990 (see Figure 4). A significant part of this cost decline has been attributed to global value chains, which have enabled producers to lower production costs and reap economies of scale by locating different production stages in different countries (WTO and IRENA, 2021). The capacity of solar panels globally traded in 2017 reached almost 80 GW – the equivalent of more than 9 per cent of global electricity generation (Wang *et al.*, 2021).

Although many new environmental technologies are developed in high-income economies, the production of many clean energy and energy efficiency goods and services is increasingly spread across all economies. Regional and global value chains offer many economies, including developing ones, an opportunity to participate by supplying

Figure 4: As solar photovoltaic (PV) panel exports rise, their price falls

Source: WTO (2022b).

parts, components and services to produce, distribute and market many clean energy and energy efficiency technologies. For instance, China, Malaysia and Viet Nam are major exporters of solar power products, including solar panels and solar water heater devices.

Trade in environmental services can also support the uptake of clean energy and energy efficiency technologies. Many clean energy and energy efficiency services are closely linked with clean energy and energy efficiency goods, since the provision of these services often relies on the use of related environmental goods. This is also true of other ancillary services essential for clean energy and energy efficiency technologies, such as research and development, engineering and construction, distribution and transport, and the sale, delivery, installation and maintenance of equipment. For instance, more than 70 per cent of labour for solar photovoltaic deployment is concentrated in installation, grid connection, operation and maintenance services (IRENA, 2017).

Trade in renewable energy and electricity can also help to make production processes cleaner by providing access to affordable sustainable and renewable energy sources. International trade in renewable energy and electricity can help to compensate for the uneven geographical distribution of usable sunlight and wind, though this

hinges on important technological breakthroughs, notably in energy storage. More developing economies are already moving to harness their abundant renewable energy potential. For instance, Morocco hosts the world's largest solar power station, while Egypt is building a solar photovoltaic park, touted to become the world's largest.

Addressing trade barriers in clean and renewable energy

Well-designed climate policies are essential to encourage the market, investors and consumers to make more low-carbon investment and consumption decisions, including with respect to energy. In this context, international trade and trade policies can contribute to enabling access to and development and deployment of clean energy equipment and energy-efficient goods and services.

Conversely, barriers to trade in clean and renewable energy equipment and energy-efficient goods can be significant. The average import-weighted applied tariffs on an illustrative list of renewable energy equipment remain relatively low, ranging from around 2.4 per cent in high-income countries to 8.3 per cent in low-income countries. However, these averages mask tariff peaks as high as 50 to 80 per cent applied by some economies on some of these products. In addition, an increasing number

of antidumping duties and countervailing measures – sometimes exceeding 100 per cent – have been applied to some of these environmental goods.

Information about trade restrictions on environmental services can be limited, and restrictive national regulations, such as professional qualifications and immigration rules, can hinder the delivery, installation and maintenance of clean and renewable energy and energy-efficient equipment in economies with limited domestic technical capacities.

Opening up trade in energy-related environmental goods would raise global exports of these goods by 5 per cent by 2030, as well as raising global GDP by reducing distortions and increasing productivity. According to WTO simulations, the elimination of tariffs and a 25 per cent reduction in the *ad valorem* equivalent of non-tariff measures on energy-related environmental goods would increase trade in energy-related environmental goods in real terms by US\$ 109 billion (Bacchetta et al., 2022).

While opening up trade in energy-related environmental goods would increase overall economic activity and global GDP by raising the demand for energy and transport, thus increasing carbon emissions, WTO simulations indicate that the net effect would actually be a small reduction in global carbon emissions of 0.58 per cent relative to the baseline by 2030. This projected fall captures only carbon dioxide (CO₂) reductions resulting from increased energy efficiency and replacing non-renewable energy sources with renewable ones. Further CO₂ reductions can be achieved through the knock-on effects of accelerating the spread of environmental innovation, including by increasing the demand for ancillary services relative to the sale, delivery, installation and maintenance of clean energy and energy efficiency technologies, which would drive down the costs of clean energy and of energy efficiency technologies, thereby providing economies with greater opportunities to adapt clean energy and energy efficiency technologies to their local needs.

Ambitious, credible and timely climate policies can increase the contribution of trade in clean energy goods and services to the transition to a low-carbon economy. The development, adoption and supply of clean energy technologies also rely on well-targeted and adequately financed investment into well-functioning quality energy infrastructure. Policies to reduce uncertainties surrounding low-carbon investments are essential.

International trade cooperation can speed up access to affordable clean energy worldwide

International trade cooperation plays a critical role in facilitating trade and investment in clean energy equipment and in energy-efficient goods and services. Addressing the barriers that hinder the adoption and diffusion of these environmental technologies requires trade cooperation at the regional and multilateral levels.

Regional trade initiatives and agreements have been the main avenue to promote trade in clean energy and energy-efficient goods and services. In 2012, members of the Asia-Pacific Economic Cooperation (APEC) agreed to reduce their respective applied tariff rates to 5 per cent or less by the end of 2020 on a set of 54 environmental goods, including solar panels and wind turbines. Facilitating and promoting trade and foreign direct investment in clean energy and energy-efficient goods and services are also explicitly addressed in an increasing number of regional trade agreements.

At the multilateral level, WTO disciplines ensure that trade in clean energy and energy-efficient goods and services flows as predictable and freely as possible. While past multilateral and plurilateral negotiations at the WTO were inconclusive, clean energy and energy-efficient goods and services benefitted from trade-opening as part of the Uruguay Round establishing the WTO.

In addition, trade in clean energy and energy-efficient goods and services is fostered by the non-discriminatory, transparent and predictable trade environment underpinned by WTO rules. For instance, the Agreement on Technical Barriers to Trade (TBT Agreement) ensures that technical regulations, standards and conformity assessment procedures on clean energy and energy-efficient goods do not create unnecessary obstacles to trade and are based on relevant internationally-agreed standards. The protection and enforcement of intellectual property (IP) rights under the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) are also essential to support innovation in clean energy and energy-efficient technologies, while also promoting the transfer of technology.

Discussions among WTO members contribute to increased transparency and cooperation on clean and renewable energy. At the WTO Committee on Trade and Environment, members address issues at the intersection between trade and the environment, exchanging information about national renewable energy and energy efficiency programmes, as well as regional initiatives to promote clean energy.

Furthermore, following up on years of productive discussions in the CTE, the Fossil Fuel Subsidy Reform (FFSR) initiative was officially launched in December 2021 and currently comprises 48 WTO members. The initiative seeks to rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption and encourages members to share information and experiences to advance discussions at the WTO.

The WTO could make a greater contribution to promoting trade in clean energy and energy-efficient goods and services by advancing initiatives pursued by different groups of WTO members. For example, participants in the Trade and Environmental

Sustainability Structured Discussions (TESSD) explore opportunities, best practices and possible approaches for facilitating trade in environmental goods and services. The FFSR initiative also seeks to rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption. WTO members could turn these discussions into concrete actions which foster trade in clean energy and energy-efficient goods and services.



SDG 9: Industry, Innovation and Infrastructure

KEY POINTS

- Governments are adopting and implementing policies aimed at supporting the creation of fruitful innovation ecosystems, technology transfer and industrialization. Domestic intellectual property regimes can be tailored to support the policy objectives of different economies, and at the same time can provide the necessary certainty and predictability to the innovation ecosystem.
- The WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) plays a crucial role in promoting innovation by incentivizing creators, protecting their rights, facilitating technology transfer, encouraging investment, fostering competition, and establishing international standards for intellectual property protection and enforcement.
- Government procurement of construction services is key to improving public infrastructure. The WTO plurilateral Agreement on Government Procurement (GPA 2012) provides a framework for the conduct of government procurement and help its parties to attract investment to boost public infrastructure.
- Aid for Trade plays a significant role in supporting the industrialization, innovation and improvement of trade infrastructure in developing economies. Aid for Trade disbursements increased during the pandemic, reaching an all-time high of US\$ 48.7 billion in 2020 and supported projects that prioritized building productive capacity and economic infrastructure.
- There has been an increase in the use of subsidies and new developments that underpin current industrial policy have exposed certain gaps in the existing rules. Therefore, to maintain the transparency, openness, and predictability of the multilateral trading system it is important to increase multilateral cooperation on subsidies.

Government policies to promote innovation and sustainability

In many economies, governments have implemented policies with the objective of improving the business environment or tilting the structure of economic activity toward sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of such intervention. Governments generally justify the adoption of sectoral-level

policies in order to foster long-term growth, increase incomes and productivity, and, in doing so, promote entrepreneurship, innovation, technology transfer, skill development and competition.

Innovation policies have shifted with the evolving landscape of technologies. Initially, industrial policies were narrowly defined as policies that aimed to build capacity mainly in the manufacturing sector. Today, digitalization is one of the primary drivers in spurring innovation and productivity in fields such as science, technology and medicine – for example, the current wave of digital general-purpose technologies

includes artificial intelligence (AI), predictive technologies, highly sophisticated automation and big data (WIPO, 2022a). Many countries aim to modernize their economies, including their traditional manufacturing sectors, in a way that promotes the shift from mechanical and analogue production to digitally-enabled production processes and services.

Increasing concerns about environmental degradation and climate change have given rise to government interventions to direct the economy towards a green growth path. The policy tools to address sustainability issues can include command-and-control measures (i.e., regulatory measures or prohibition of certain products and practices), market-based instruments (e.g., carbon pricing, government support and government procurement), information instruments to provide environment- and

energy-related information to allow for informed choices, and voluntary agreements.

Open and transparent trade policies have also contributed to the development and the spread of environmentally friendly and low-carbon technologies. The shift to low-carbon farming – especially climate-smart agriculture techniques that focus on intercropping, crop rotation, agroforestry and improved water management – could bring further benefits to developing-economy farmers in terms of improved productivity, greater resilience, less deforestation, and reduced reliance on fertilizers and fuels (WTO, 2022b). In short, the diffusion of low-carbon technologies can provide poorer economies with the tools they need both to limit carbon emissions and to accelerate their development.

CASE STUDY

The steel industry

As the steel industry works toward carbon-neutral production, the WTO can help it to lower costs and reduce potential trade fragmentation by facilitating coherence and transparency in decarbonization standards.¹⁵

The transition of the steel industry and investments in breakthrough steelmaking technologies, in line with decarbonization standards, can present new opportunities for developing economies. New supply chains may open as steelmaking shifts to near-zero emission technologies, and as new inputs such as green hydrogen and the natural comparative advantage of developing economies could be exploited to allow them to integrate into these networks (IEA et al., 2022).

For example, there is potential for South Africa to enter into green primary iron production value chains (Trollip et al., 2022). Harmonizing decarbonization standards across the iron and steel value can be beneficial for developing economies to exploit these new opportunities.

It is worth noting there is no one-size-fits-all approach to innovation policy. Different sets of policies are relatively more appropriate for countries at different levels of economic development. At early stages of development, governments may favour investment-based strategies, while home-grown innovation becomes more important as an economy grows and approaches the world technology frontier (i.e., the most recent technological innovations). Coupled with open and competitive markets, innovation policy can help countries to escape the middle-income trap (i.e., the failure of a country to transition from a middle-income to a high-income economy because of rising costs and a decline in competitiveness) by fostering the most innovative entrepreneurs. However, in industries and firms far from the technology frontier that have not yet adopted the most recent technological innovations, productivity is more likely to be spurred by improvements in management practices. Likewise, investment in primary and secondary education, for example, is relatively more effective compared to investment in higher education in developing economies.

Other government policies can be beneficial for innovation. The economic literature highlights that research and development tax credits tend to increase research and development spending and, in some cases, increase patenting activity. Government research spending and procurement have a generally positive impact on innovation. Recent research shows that public funding of university research leads to more patents being filed by private firms.¹⁶ Government research grants allocated in a competitive way to private firms generally succeed in stimulating private research and development. The effect is particularly prevalent for small firms, which are more likely to experience external financial constraints. Governments can also have a large impact on innovation through procurement policies, especially those directed towards sectors and firms with high technological content.

Education, in particular in science, technology, engineering and mathematics (STEM), is associated with higher levels of innovation activities. Policies to increase the supply of STEM graduates and

attract highly skilled immigrants have been shown to boost innovation. Highly skilled scientists and engineers from developing economies who work abroad can also generate net positive gains in their home countries when they return back or foster collaboration with local entrepreneurs.

Promoting competitive markets is generally beneficial to innovation. Studies have shown that market entry barriers raised by product market regulation reduce the intensity or the efficiency of research and development in the same sector or in downstream sectors. Several studies show that the removal of market entry barriers fosters innovation, including in digital sectors. In developing economies that are far from the world technology frontier, policies limiting product market competition may be useful to improve the short-run allocation of resources but may have adverse long-run consequences.

Other policies that create an innovation-friendly environment include building and maintaining telecommunications infrastructure and favouring agglomeration and early exposure to innovation.

Examples of WTO initiatives that facilitate innovation

The plurilateral WTO Agreement on Government Procurement (GPA 2012) provides that its signatories must open their government procurement markets to each other's suppliers in a reciprocal manner. The GPA 2012 can help governments to obtain better value for money, for example, when purchasing climate-friendly goods and services through green public procurement. Notably, the GPA 2012 allows parties to apply technical specifications aimed at promoting natural resource conservation or protecting the environment. It also allows parties to use the environmental characteristics of a good or service as an award criterion in evaluating tenders (2022b).

The Aid for Trade initiative helps developing economies, in particular LDCs, to build the trade capacity and infrastructure they need to increase their participation in and benefit from international trade. A limited but increasing number of Aid for Trade projects integrate environmental considerations. In 2020, Aid for Trade disbursements with a climate objective (i.e., adaptation, mitigation or an objective that includes both) amounted to US\$ 15 billion, representing 31 per cent of total Aid for Trade. Around US\$ 5.75 billion, or 12 per cent of total Aid for Trade, were allocated to projects with adaptation as a single or cross-cutting climate objective (2022b).

The role of intellectual property and the WTO TRIPS Agreement in innovation

Intellectual property (IP) and the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) play significant roles in promoting innovation.

IP refers to the rights granted to individuals or organizations (i.e., natural or legal persons) over their creations or inventions. It encompasses different rights; for example, copyrights protect creations and patents protect inventions. IP supports innovation by:

- Providing incentives: IP rights provide creators and innovators with control over their creations or inventions for a specific period of time and allow them to authorize third parties to use the innovation. By granting them the right to profit from their work, IP encourages individuals and businesses to invest time, effort and resources into research and development, thereby stimulating innovation.
- Facilitating technology transfer: The IP regime provides the infrastructure that enables creators and inventors to license or transfer their rights to others in exchange for royalties or fees. This facilitates technology transfer and fosters the dissemination of knowledge and innovations across different industries and regions.
- Attracting investment: Effective IP protection enhances investor confidence by safeguarding investments in innovative projects. Investors are more likely to support ventures where IP rights are respected, as it ensures their potential returns and reduces the risk of unauthorized use or imitation.
- Promoting competition: IP rights enable innovators to differentiate their products or services from competitors, fostering healthy competition in the marketplace. This drives companies to innovate continually and to improve their offerings with a view to gaining a competitive edge, with the benefits to consumers being enhanced choices and quality.

To further explore the connection between IP and innovation, we must also look to the TRIPS Agreement, as it is the most comprehensive international instrument on IP rights and their protection, incorporating disciplines that were previously scattered in different conventions.

The TRIPS Agreement is an international agreement administered by the WTO and sets out the minimum standards for IP protection and enforcement to which members must adhere. Its Article 1 provides that WTO members are free to implement the TRIPS Agreement according to their own legal systems and practices. Article 7 spells out the public

policy purpose of the IP system, i.e., that it should help promote both innovation and the transfer and dissemination of technology, to the mutual advantage of producers and users, conducing to social and economic welfare and to a balance of rights and obligations.

The TRIPS Agreement, therefore, has several implications for innovation:

- **Harmonization of IP Standards:** The TRIPS Agreement establishes a uniform set of IP standards and enforcement mechanisms to be implemented by WTO members, which ensures a consistent level of IP protection worldwide, and this in turn creates a more predictable and stable business and investment environment for private sector operations.
- **Access to technology and knowledge:** The TRIPS Agreement recognizes the importance of striking a balance between protecting IP rights and ensuring access to essential technologies, particularly in areas of public health, agriculture and education. It also encourages WTO members to adopt measures that promote technology transfer and access to affordable medicines, while respecting IP rights. WTO ministerial decisions have reaffirmed WTO members' rights to use the flexibilities available in the TRIPS Agreement when pursuing public health objectives.
- **Enforcement and dispute resolution mechanisms:** The TRIPS Agreement provides a framework for creators and inventors to address issues related to infringement of their IP rights in the respective domestic court system. It is also covered by the WTO Dispute Settlement Understanding, which enables members to bring cases related to the TRIPS Agreement.
- **Technology capacity-building:** The TRIPS Agreement includes provisions that promote technology transfer to least-developed country members, encouraging developed members to assist developing nations in enhancing their technological capabilities, thereby fostering innovation and economic growth.

The domestic implementation of the TRIPS Agreement is an integral part of the innovation ecosystem and provides the necessary incentives and certainty for researchers and investors to venture into new areas, as well as legal avenues for collaborations and partnerships, including technology transfer and licensing. Each WTO member can tailor its IP regime to support its domestic priorities and policy choices. Thus, the notion of "TRIPS implementation" broadens and matures into a strengthening of domestic capacity to analyse and give effect to a policy option within the general framework of principles established by the

Agreement, increasingly informed by the horizontal dissemination of knowledge about practical choices implemented by countries of similar economic and cultural background.

The IP regime is also an important factor in technology transfer, as it clarifies ownership, strengthens an inventor's negotiating position and the recipient's role, and helps to attract partners and financing (WIPO, 2022b). While the TRIPS Agreement encourages technology transfer, it must be borne in mind that this is a practical craft that depends on a variety of factors to be successful. It requires the receiving economy or region to be capable of creating the right conditions for a solution to work, such as:

adequate education or training;

- a stable electricity supply;
- good tele-communications and internet connectivity;
- reliable transport and delivery systems;
- a functioning legal system;
- efficient financial services;
- openness to trade;
- a well-functioning and sizeable market; and
- peace and stability.

Technology transfer can also take different channels, including foreign direct investment (FDI), international trade, joint research, patents and licensing, and mobility of know-how, such as corporate temporary transfers and migration.

When it comes to the impact of the TRIPS Agreement on development and developing economies, this is a complex issue which is often subject to debate. While the TRIPS Agreement has provisions that aim to strike a balance between IP protection and development, it is important to note that the impact of the TRIPS Agreement on development is not uniform across all developing economies, as their circumstances, priorities and capacities differ. Some economies have effectively utilized IP protection to drive innovation and economic growth, while others face challenges in accessing essential technologies or medicines.

Balancing IP protection with development needs remains a complex task, and ongoing discussions and initiatives in the WTO aim to address concerns and enhance the positive impact of IP systems on development in developing economies. Nevertheless, IP and the TRIPS Agreement play crucial roles in promoting innovation by incentivizing creators, protecting their rights, facilitating technology transfer, encouraging investment, fostering competition and establishing international standards for IP protection and enforcement.

CASE STUDIES

IP and innovation in developing economies

COTTON, EGYPT

Egypt is one of the leading producers of premium cotton fibers in the world. In 1932, private cotton stakeholders established the Alexandria Cotton Exporters Association (ALCOTEXA), which operates as a non-profit organization with the goal of fostering cotton trade. In 2001, the Egyptian Ministry of Economy and Foreign Trade, along with ALCOTEXA, developed a logo consisting of figurative elements (the drawing of a cotton flower) and the words “Egyptian Cotton” to promote and increase the export of cotton products from Egypt. The two entities jointly registered the Egyptian Cotton™ logo as an international trademark under the WIPO Madrid System. The logo is also protected in specific national jurisdictions, and is registered as a trademark in some countries such as Denmark, the United Kingdom and the United States.



The use and protection of the logo, combined with promotional activities, a part of the branding strategy employed to increase consumer recognition of the high quality and specific attributes of Egyptian cotton which differentiate it from cotton produced elsewhere and justify its premium price.¹⁷ Despite the pandemic- and war-related disruptions, in 2021-2022 Egypt succeeded in exporting 50,000 tons of cotton, worth USD 274 million.¹⁸

SONO FILTER, BANGLADESH

IP can contribute to driving positive social impact to improve the quality of lives. For example, in Bangladesh, drinking water contaminated with arsenic – a highly toxic chemical – is very prevalent due to a confluence of interlinking factors. Out of 64 districts, water in 61 districts has arsenic concentration above the safe limit, and up to 77 million people have experienced health problems as a result.

To mitigate this problem, in 2001 Dr Abul Hussam, a Bangladeshi chemist, developed a simple and effective filter – the SONO filter – to remove arsenic from water. This product is patented as the “Arsenic Removal Filter” (Patent No. 1003935, 2002) with the Department of Patents, Designs and Trademarks of Bangladesh. Two international patent applications for the combination of active materials in the system have been made under the Patent Cooperation Treaty (PCT), and a patent in the United States has been pending as of 2010.

The SONO filter has prevented hundreds of thousands of people in Bangladesh from experiencing health problems due to arsenic poisoning. For example, according to Dr Hussam, many patients experiencing arsenical melanosis (skin pigment changes) have recovered and have witnessed significant health improvements. In addition, there are no new cases of arsenicosis among people drinking the water filtered with the SONO filter. Since 2010, as many as one million people are believed to be using the SONO filter, and new filters are continuously being installed.¹⁹

AFLUENTA, ARGENTINA

IP plays an instrumental role in protecting innovative technologies such as Web 3.0 and fintech (i.e., financial technology). For example, Afluenta is a marketplace lending platform that connects borrowers and lenders directly, without the involvement of banks. IP is key to Afluenta. The processes Afluenta designs, the codes, the training methodology, the onboarding method and the assessment algorithms are all protected with trade secrets, i.e., IP rights on confidential information which may be sold or licensed. The protection of its IP assets was instrumental in helping Afluenta to attract investors to scale up its business operations.²⁰

Policies of micro, small and medium-sized enterprises

Micro, small and medium-sized enterprises (MSMEs) account for most businesses worldwide and are important contributors to job creation and global economic development. Recently, various delegations shared their national best practices for MSMEs during the TRIPS Council:

- In Chile, trade policy has been geared towards increasing participation in international trade as a way of guaranteeing that the benefits of trade have a positive impact on economic growth and the reduction of inequality.²¹
- South Africa has launched flagship programmes that aim to help small businesses to benefit more meaningfully from the IP system. For example, the Inventor Assistance Program (IAP) was launched jointly by WIPO and the Companies of Intellectual Property Commission (CIPC). The programme aims to make the IP system more accessible to under-resourced inventors, including when they apply for patent protection, either as individuals or as a part of an MSME. This is achieved by providing online courses on the importance of IP protection and by pairing inventors with pro bono patent attorneys.²²
- In India, the Ministry of Micro, Small & Medium Enterprises has launched a National Manufacturing Competitiveness Programme (NMCP) to improve the competitiveness of the MSME sector. The programme includes a component called “Building Awareness on Intellectual Property Rights (IPR) for Micro, Small and Medium Enterprises”, which aims to increase productivity, upgrade technology, conserve energy in the manufacturing processes and expand the domestic and global market share of Indian MSME products. Another component of this programme is to provide financial assistance with regard to patents and registration under geographical indications of goods.²³

The role of the Agreement on Government Procurement (2012) in infrastructure development

Investment in global public infrastructure constitutes a significant public expenditure, which is expected to rise to US\$ 71 trillion by 2030 according to estimates of the Organisation for Economic Cooperation and Development (OECD).²⁴ Infrastructure investment plays a crucial role in tackling development challenges in such sectors as transportation, energy, information and communications technology (ICT), water and

sanitation. Inefficient and poor quality infrastructure has a negative impact on citizens' welfare and safety, and environmental challenges such as climate change may exacerbate this impact (UNEP, 2021). Inadequate public infrastructure also affects developing economies' chances of successfully integrating into global value chains and realizing the gains from trade (Niggli and Osei-Lah, 2014).

Government procurement of construction services is key to improving public infrastructure (Niggli, 2015). It can contribute to SDG 9 (“Industry, innovation and infrastructure”), by helping both to upgrade existing infrastructure and to achieve new, more sustainable infrastructure. However, successful infrastructure procurement depends on well-governed procurement systems that ensure integrity, transparency and accountability – according to one study, “83% of all deaths from building collapse in earthquakes over the past 30 years occurred in countries that are anomalously corrupt” (Ambraseys and Bilham, 2011).

The WTO Agreement on Government Procurement (GPA 2012) is a plurilateral agreement to which any WTO member may accede. It provides a framework for the conduct of government procurement in the context of an open trading system and supports its parties in maximizing value for money in their procurement systems through international trade. It also strengthens good governance in those systems, including by obliging its parties to conduct procurement in ways that prevent corruption and avoid conflicts of interest (Anderson et al., 2016).

Thus, the GPA 2012 can help its parties to enhance international investors' confidence in domestic procurement systems and attract the participation of international, well-reputed infrastructure suppliers in public tenders, which, in turn, can help GPA parties to achieve more affordable, reliable, sustainable and resilient public infrastructure. In the infrastructure sector, international participation can also foster local economic development, as it often results in subcontracting of locally established suppliers and the diffusion of international business standards and practices.

The GPA 2012 does not automatically cover all the public infrastructure procurement activities of each GPA party. For each party, only procurement activities carried out by specified covered procuring entities and concerning specified goods, services or construction services, as well as public contracts valued above a specified threshold, are subject to the disciplines of the GPA 2012. For most GPA parties, the threshold for procurement of construction services is SDR²⁵ 5 million (approximately US\$ 6.7 million). This means that below-threshold government procurement of construction services can be reserved for the domestic industry or for joint ventures between international suppliers and the domestic industry. This gives developing economies policy space to pursue industrialization objectives,

and can provide opportunities for domestic suppliers to gain experience and grow, enabling them to compete for larger-scale infrastructure projects.

Moreover, the GPA 2012 provides flexibilities for developing economies to manage their transition to a more internationally open and competitive government procurement system. Specifically, least-developed-country (LDC) WTO members and any other developing-economy WTO members may be accorded special and differential treatment (e.g., the possibility of delaying the application of certain GPA 2012 obligations), where and to the extent that it meets their development needs. The available flexibilities are in principle time-bound and subject to negotiation with existing GPA parties (Niggli and Osei-Lah, 2014).

In sum, infrastructure procurement is central to achieving sustainable development in the Global South. The GPA 2012 is an adaptable predictability- and integrity-enhancing government procurement framework that can assist developing economies in meeting their needs for resilient and sustainable public infrastructure, while at the same time ensuring cost-effectiveness and thus a sustainable burden of debt for future generations (UNEP, 2021).

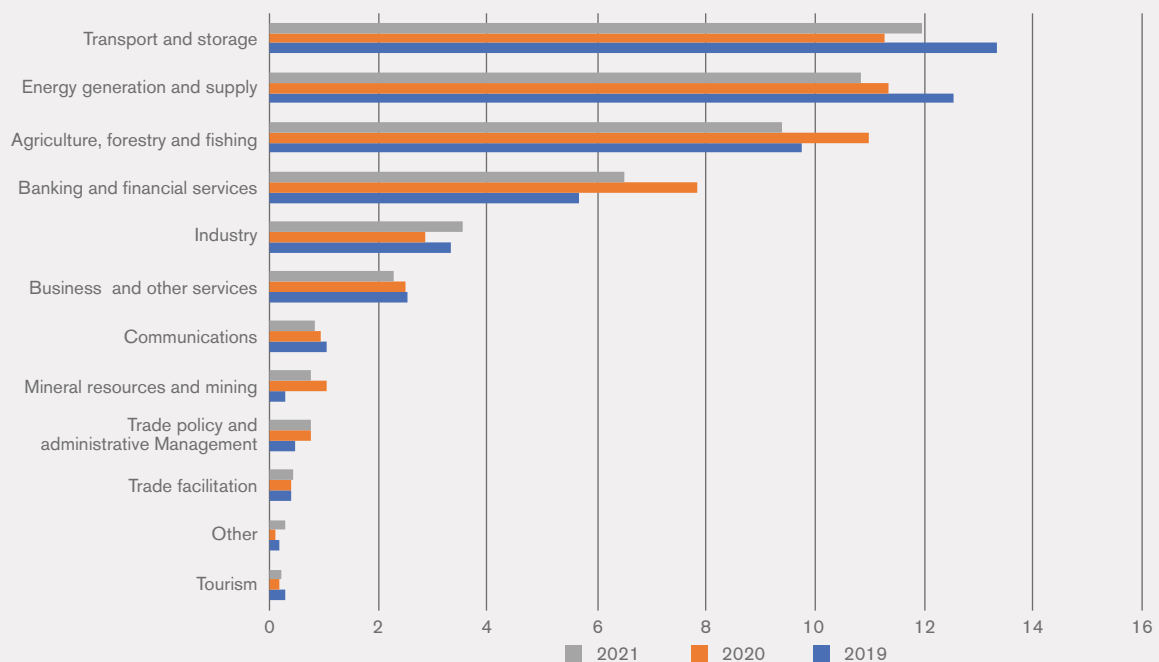
The role of Aid for Trade in SDG 9

Aid for Trade has a significant role to play in supporting industrialization and innovation in several developing economies. This support has helped these economies to improve their trade infrastructure, promote export-oriented industries, and improve their business environments, which has resulted in a significant increase in exports and helped to promote innovation and entrepreneurship in these economies.

For instance, Aid for Trade has helped to establish a strong information and communications technology (ICT) sector in Rwanda. The Rwandan Government has partnered with private companies to establish tech hubs, which has helped to mobilize private sector funds and international investors and to create jobs, promote innovation, and improve the economy. In another example, Ghana received a total of US\$ 7.1 billion in Aid for Trade disbursements, which have contributed to upgrading trade infrastructure, promoting export-oriented industries and improving Ghana's business environment.

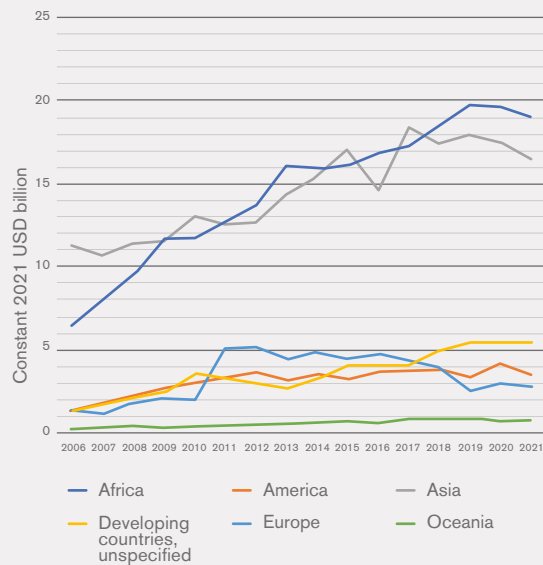
Official development assistance (ODA) remains an important source of finance for developing economies, particularly for low-income economies. In 2019, ODA represented 63 per cent of external inflows to low-income economies, 37 per cent in lower middle-income economies and 20 per cent in upper middle-income economies (OECD, 2019).

Figure 5: Disbursements by sector, 2019-2021



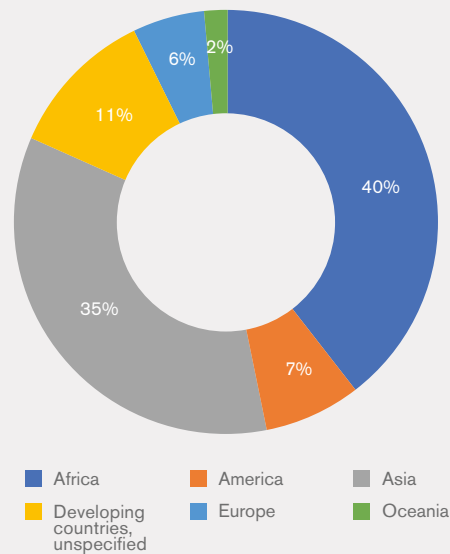
Source: Author's calculations based on the OECD/Creditor Reporting System (CRS) database (2022).
 Source: Based on OECD (2022), OECD.Stat, Creditor Reporting System, <https://stats.oecd.org/>.

Figure 6. Total disbursements by region



Source: Based on OECD.Stat (<https://stats.oecd.org/>).

Figure 7. Share of disbursements by region, 2021



Aid for Trade represents a considerable share of ODA, and accounted for 22 per cent of total ODA disbursements and 26 per cent of ODA commitments in 2020. In recent years, an increased focus has been placed on mobilizing all types of resources towards the SDGs.

Aid for Trade disbursements increased during the pandemic, reaching an all-time high of US\$ 48.7 billion in 2020. Projects have prioritized building productive capacity and economic infrastructure, which jointly accounted for 98 per cent of disbursements in 2020. In 2020, Africa received the largest share of Aid for Trade disbursements (38 per cent), followed by Asia (35 per cent), America (10 per cent), Europe (6 per cent) and Oceania (1 per cent). Responses to the 2022 Aid for Trade monitoring and evaluation exercise suggest a shift towards sustainability considerations, including climate change, and gender equality. In 2020, 51 per cent of Aid for Trade commitments included climate-related objectives, representing 56 per cent of total climate-related ODA commitments in 2020.

The geographical distribution of Aid for Trade

In 2020, Asia and Africa jointly accounted for 73 per cent of Aid for Trade disbursements – a share that has remained relatively stable since 2013. A total of 38 per cent of disbursements went to Africa, followed by Asia (35 per cent), America (10 per cent),

Europe (6 per cent) and Oceania (1 per cent). These shares are almost identical to the Aid for Trade commitments for those regions (38 per cent to Africa, followed by 36 per cent for Asia, 10 per cent for America, 6 per cent for Europe and 1 per cent for Oceania) indicating that donors follow through with their stated commitments.

Since 2018, Aid for Trade disbursements allocated to Africa have exceeded disbursements to Asia. America saw the highest growth, from US\$ 3.1 billion to US\$ 5 billion (+61 per cent) (see Figure 6).

Important differences exist in the type of Aid for Trade projects implemented across different regions. For example, a majority (54 per cent) of Aid for Trade disbursements to Africa focus on building productive capacity, while in Asia, support to economic infrastructure is predominant (63 per cent of disbursements) (see Figure 6).

Aid for Trade directly contributes to several trade-related SDGs, notably SDG 8 (“Decent work and economic growth”). SDG 8 includes a target to increase Aid for Trade support for developing economies, in particular least-developed countries (LDCs), including through the Enhanced Integrated Framework (EIF) for trade-related technical assistance to LDCs (UN Stats, 2021). Aid for Trade also contributes to the SDGs in ways that go beyond purely trade-related targets, including by enhancing the benefits of international trade. The Addis Ababa Action Agenda recognises that, with appropriate supporting policies, including those

targeting infrastructure and education, trade can also help to promote productive employment and decent work, women's empowerment and food security, contributing to a reduction in inequality and to the SDGs.

Recent pilot methodologies developed by the OECD using machine learning provide new insights into the contribution of Aid for Trade to the SDGs. For example, the data from the 2022 Aid for Trade report show that overall Aid for Trade contributes to all SDGs, and that each Aid for Trade project contributes to at least one SDG. In 2020, 18 per cent of Aid for Trade resources disbursed targeted SDG 7 ("Affordable and clean energy"), 17 per cent targeted SDG 9 ("Industry, innovation and infrastructure") and 16 per cent SDG 8 ("Decent work and economic growth").

According to responses to the joint OECD/WTO 2022 monitoring and evaluation exercise, 96 per cent of partner countries that participated in the survey include environmental considerations in their national development strategies, policies and plans, and 86 per cent have embedded such objectives in national trade development policy documents.

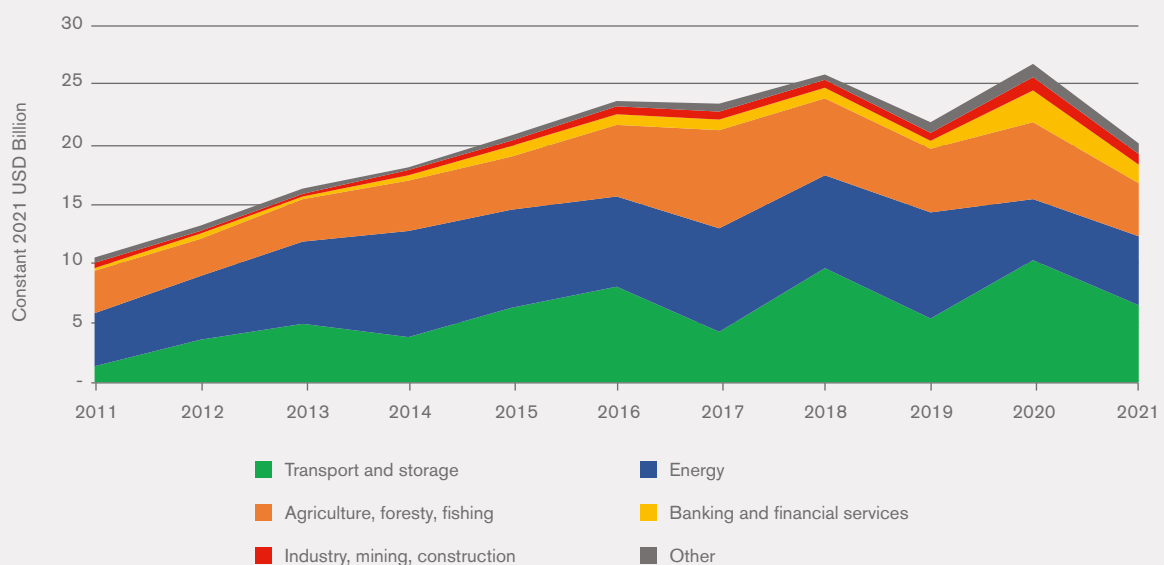
A large share of climate-related Aid for Trade commitments is concentrated in a few sectors, with energy, transport and storage, agriculture, forestry and fisheries making up 85 per cent of these commitments. These shares have remained relatively stable over the years, although climate-related commitments in the transport and storage sector more than doubled between 2019 and 2020 (+104 per cent) (see Figure 8).

Within the energy sector – which accounts for a large share of total carbon emissions – there is an emerging trend to allocate more and more support to renewable energies. The share of Aid for Trade disbursements allocated to renewable sources increased by 36 per cent between 2019 and 2020, from US\$ 3.3 billion to US\$ 4.5 billion. During the same period, the share of disbursements to non-renewable sources decreased by 26 per cent (from US\$ 1.6 billion to US\$ 1.2 billion) (see Figure 9).

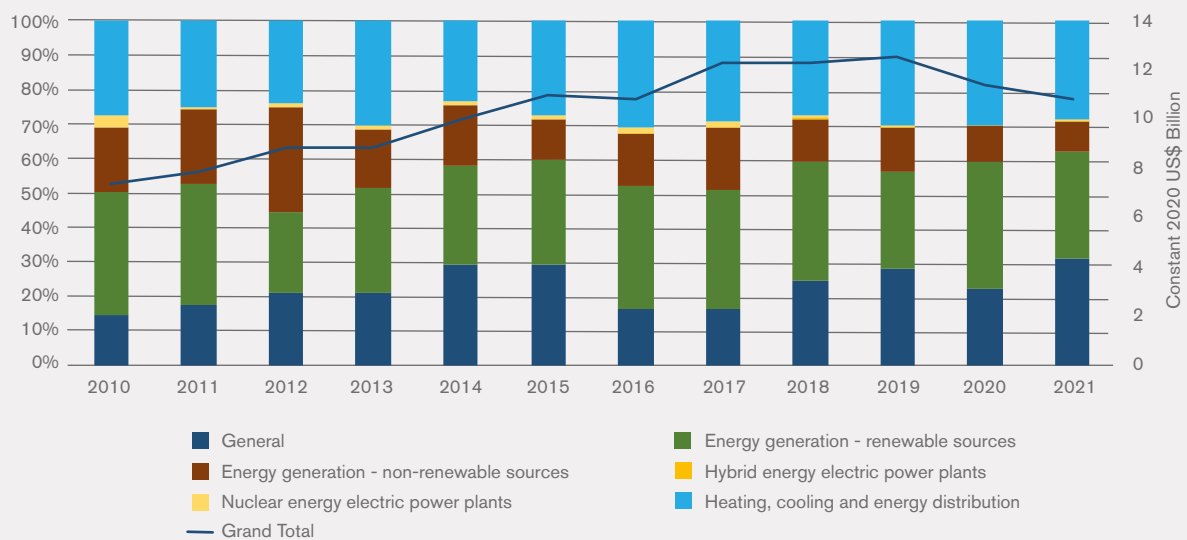
Furthermore, it is important to note that trade-related official development finance beyond ODA has increased and, together with Aid for Trade, has contributed to mobilizing additional resources in trade-related sectors. Both commitments and disbursements in other official trade-related flows have increased in recent years, reaching US\$ 44 billion in disbursements and US\$ 87 billion in commitments in 2020.

Furthermore, recent data collected by the OECD sheds light on the role of official development finance in mobilizing private resources for development. The data shows that during 2012-20, 86.6 per cent of private sector resources mobilized were in trade-related sectors, with an average annual growth of 16.3 per cent.

Figure 8: Climate-related Aid for Trade Commitments by sector, 2011-21



Source: OECD.Stat, Creditor Reporting System (<https://stats.oecd.org/Index.aspx?ThemeTreeId=3>).

Figure 9: Energy generation and supply disbursements, 2011-20

Source: OECD.Stat, Creditor Reporting System (<https://stats.oecd.org/Index.aspx?ThemeTreeId=3>).

Source: Based on OECD.Stat (<https://stats.oecd.org/>).

Strengthening multilateral cooperation on industrial subsidies

In a modern economy, subsidies deserve special attention because they constitute a pre-eminent industrial policy tool. They are also one of the industrial policy instruments subject to the most multilateral regulation. To better understand both their role in modern industrial policy and the need for multilateral cooperation on this issue, it is important to recall the reasons why subsidies are subject to international rules.

During the establishment of the multilateral trading system under the General Agreement on Tariffs and Trade (GATT), and subsequently the WTO, members recognized that subsidies or financial support from the government could serve certain legitimate and economically useful policy objectives, such as correcting certain market failures. However, it was also recognized that subsidies can have adverse effects on trade, on the global commons and on the efficient allocation of global resources, which is one of the objectives set out in the preamble of the Marrakesh Agreement creating the World Trade Organization.

Classic economic theory holds that the market is the most efficient mechanism for allocating resources. This is because the market is driven by the interaction of supply and demand, which reflects the choices and preferences of individuals and businesses. When a government interferes with the market, for example,

by providing subsidies, or by imposing price, exports or import controls, it can distort the allocation of resources and prevent the market from functioning efficiently.

In addition, government interference with the market can lead to the development of rent-seeking behaviour, where individuals or businesses seek to gain an economic advantage through the use of political influence rather than through productive economic activity. This can lead to the misallocation of resources, discourage foreign investment, harm consumers by artificially inflating the prices of goods and services, and in general undermine economic growth and prosperity.

For these reasons, and to avoid the impoverishing effects of a subsidies race, members agreed to regulate the provision of subsidies, notably through the WTO Agreement on Subsidies and Countervailing Measures (SCM Agreement) and the WTO Agreement on Agriculture. The SCM Agreement regulates subsidies on the basis of the principle that the more trade-distorting the subsidy the stricter will be the disciplines applied.

Therefore, two kinds of subsidies – export subsidies and import substitution subsidies – are prohibited, as both were specifically designed to affect trade. All other subsidies are deemed to be “actionable”. If one member believes that another member is using prohibited subsidies, or that the subsidies are causing it adverse effects, it may bring a case to the WTO and seek the withdrawal of those subsidies or removal of the adverse effects, in the case of actionable subsidies. Members which are suffering

injury to their domestic industry caused by subsidized imports may also take domestic measures, mostly in the form of import duty surcharges to “countervail” the amount of subsidization or the injury.

Despite the existence of multilateral regulation, and ample jurisprudence that clarifies it, there are still significant gaps in these international rules. These gaps have been made more evident as the rules have not been adapted to new realities and emerging global issues. The new developments that underpin current industrial policy can be summarized as:

- The emergence of global value chains, and the current need to make them more resilient to cope with extraordinary events such as the COVID-19 pandemic and increasing geopolitical tensions. This has led governments to seek alternative sources of supply and production for key inputs, energy products and foodstuffs, in some cases subsidizing local production.
- Greater awareness by governments of the urgent need to take action against climate change and the corresponding aspiration to reach a reduced-carbon-emissions economy, requiring large investments and state support for adaptation and mitigation. This has led to governments and policy experts arguing in favour of a greater use of subsidies to correct market failures and provide incentives to develop new environmental technologies. There is also a growing recognition that many existing subsidies, for example fuel subsidies, have negative environmental effects and should be subject to stricter regulation.
- A growing understanding that subsidies may play a significant role in governments’ response to economic, health, natural disaster and social emergency situations that require public intervention. These subsidies should be designed in a manner that does not support companies which are inefficient and would have exited the market, does not cause harm to trading partners, and can be easily phased out once the emergency they were meant to address has passed, preventing further distortions.
- The increased digitalization of the economy and the strategic importance of new technologies has led governments to enter a race to support these industries. Governments also believe that, because of the general-purpose nature of digital technologies, subsidies to digital innovation will lead to large cross-sectoral positive spillover effects.
- The rising importance of economies in which the state plays a central role, and of international state-owned enterprises, where some governments believe that the current rules may not be able to capture some interventions in the economy, leading to unbalanced competition. This is contributing to fuelling a debate on how

the architecture of global trade rules and their underlying assumptions of a market-driven economy may be stretched when applied to different economic models under a single rules-based multilateral system.

The urgency of increasing multilateral dialogue and cooperation to better understand and address these new realities is being compounded by recent announcements of new subsidy programmes in some major economies covering key sectors such as electric vehicles, renewable energy and semiconductors. Access to some of these funds has been made contingent on the use of domestic inputs and localizing production.

These measures could have a negative impact on the global economy, as trying to repatriate production could result in price inflation which will harm the poorer and most vulnerable economies and people. These types of subsidies could also create duplication of supply chains, increasing inefficiencies and may ultimately raise the costs of transitioning to a green economy, or lead to a waste of public funds.

All of this comes at a time when the WTO Dispute Settlement Mechanism, which is meant to deal with trade distorting subsidies, is not fully functional. As a result, members are less likely to challenge these measures, and there is a risk that they may instead try to reproduce them if they possess the financial means to do so.

If the transparency, openness and predictability of the multilateral trading system is to be maintained, and indeed increased, broad-based cooperation on subsidies is required. Recent evidence shows that the use of subsidies by governments is pervasive, expanding and frequently mis-targeted in terms of their envisioned policy goals²⁶. This condition not only raises questions about the economic efficiency of such subsidies, but also encourages the employment of unilateral trade remedy measures, erodes public support for open trade, and contributes to severe commercial disputes that obstruct the achievement of other international goals, including those inscribed in the 2030 Agenda for Sustainable Development.

Governments should move quickly to enhance and clarify the international rules governing subsidies, while also acknowledging the useful functions that properly crafted subsidies can play to correct market failures, spur technological innovation and provide social safety nets. More work is required to develop an agenda to better the understanding of present subsidy programmes and their consequences for trade partners and the global commons. By taking a more active part in transparency, research and consultation about subsidy methods, international organizations can also be of assistance in this important and urgent task.²⁷

SDG 11: Sustainable Cities and Communities

KEY POINTS

- Tourism can contribute to revenue generation and economic growth for cities. However, it is crucial to address the negative impacts of tourism, such as overcrowding, pollution and cultural commodification. Therefore, sustainable tourism practices that prioritize the well-being of residents and the environment are necessary.
- Trade can help to make cities and communities inclusive, resilient and sustainable by increasing access to environmental goods and services.
- As cities around the world innovate to lower greenhouse gas emissions, address resource depletion and waste generation, and adapt to climate change, international trade in sustainable goods and environmental services will be essential in addressing these problems. More open trade also allows domestic producers of green goods and services to tap into a rapidly growing global market.
- The WTO, as a forum for the reduction of tariffs and non-tariff import barriers, provides opportunities for economies to pursue these objectives.

The role of tourism and services in supporting the development of sustainable cities

Tourism is considered a tradable service within the context of international trade. It involves the movement of people, often across borders, for the purposes of visiting and experiencing various destinations and engaging in tourism-related activities.

Cities are important destinations for both domestic and international tourism for several reasons. Many cities possess iconic landmarks and are centres of culture, art, history and entertainment, which can attract visitors from around the world, and cities often offer a wide range of tourism services to visitors, such as hotels, restaurants, transportation and tour guides.

In addition, tourism can be an important source of revenue and economic growth for cities. By attracting visitors from around the world, cities can generate income from taxes, fees and spending on local goods and services. This can help to support local businesses and create jobs for residents.

However, tourism can also have negative impacts on cities and communities, such as leading to overcrowding (“over-tourism”), pollution and cultural commodification (i.e., transforming certain aspects of a culture into a product for commercial purposes). The need to promote sustainable tourism practices, which prioritize the well-being of residents and the environment, is growing as the tourism market becomes increasingly conscious of its negative impact on the environment, as visitors become concerned about environmental issues, and as environmental groups exert pressure on public opinion regarding the effects of tourism activities.

In addition, as noted by the OECD (OECD, 2021), the pandemic has exposed long-standing structural weaknesses in the tourism economy, such as fragmentation in the sector, the fact that it is largely made up of MSMEs, its seasonality, problems caused by overdependence on this single sector, as well as gaps in government and industry preparedness for the pandemic and in response capacity. As such, many countries viewed the tourism crisis caused by the pandemic as an opportunity to move to greener and more sustainable models of tourism development by ensuring that recovery plans were aligned with sustainability principles and the

SDGs, which can act as an effective compass for both industry and policymakers.

According to the World Tourism Organization (UNWTO, 2022), sustainable tourism must:

- Conserve environmental resources and protect biodiversity;
- Respect and preserve the cultures of host communities while benefiting them;
- Address the needs of the visitors and industry while providing socio-economic benefit to all.

Measuring the sustainability of tourism

Measuring sustainable tourism can contribute to balancing the economic, environmental and social impacts of tourism.

By measuring the sustainability of tourism, cities can identify areas where improvements can be made to minimize negative environmental and social impacts, which can be helpful in designing mitigation strategies.

In addition, as tourism provides jobs and income to local economies, by measuring sustainability, tourism can benefit these communities in a way that is economically, socially and environmentally viable over the long term. Also, as travellers become interested in sustainable tourism, measuring and promoting sustainability can provide a competitive advantage for destinations and businesses that prioritize sustainability (UNWTO, 2022).

UNWTO has launched a Statistical Framework for Measuring the Sustainability of Tourism²⁸ with the objective of developing an international statistical framework for measuring the economic, environmental, and social dimensions of sustainable tourism.

The role of investment facilitation for development in the tourism sector

As an important and fast-growing industry, the tourism services sector is becoming a critical area for foreign investment, for example in hotels, restaurants, transportation services, travel agencies, tour guide services and recreational services (Peric and Niksic Radic, 2011).

Foreign investment helps to develop tourism infrastructure in the host country by bringing in global technology and expertise, and it leads to the socioeconomic, cultural and economic growth of cities. At the same time, unplanned and unmanaged

investment in the tourism sector can have negative impacts, such as environment degradation, over-tourism and a loss of cultural heritage and can render cities less resilient to social, economic and natural shocks. The only viable solution is sustainable investment in tourism, which involves two aspects.

First, investment in the sector should not harm or deteriorate the existing environmental and cultural status of the city. For instance, new investment projects that may displace either individuals who are already productively employed or local businesses, that may affect the cultural or natural heritage of the city or the environment, or that may make the city more vulnerable to natural disasters, should be undesirable.

Second, green investment should be promoted. Green investment refers to investments which reduce or remove greenhouse gases or those which help build “adaptive capacity and resilience” for climate change (Golub et al, 2011), i.e., investment in green infrastructure or in sustainability-building projects, such as pollution reduction, waste management, energy efficiency and recycling, which can help to build sustainable cities.

An efficient way to approach and encourage sustainable investment is through the WTO's Investment Facilitation for Development initiative. This initiative aims to facilitate investment flows, improving the transparency and predictability of investment measures, simplifying and speeding up investment-related administrative procedures, strengthening the dialogue between governments and investors, and promoting the uptake by companies of responsible business conduct practices. It also aims to ensure special and differential treatment, technical assistance and capacity-building for developing and least-developed economies.²⁹

The promotion of responsible business conduct practices supports economically, socially and environmentally sustainable investment. The removal of red tape reduces the likelihood of unsustainable investments seeping in due to corruption or negligent policies. Technical assistance and capacity-building supports the local economic development of cities and enables knowledge and technology transfers in areas such as environmental conservation, thereby favouring inclusive and sustainable urbanization (Peric and Niksic Radic, 2011). Predictability in investment measures, such as streamlined policies or legal frameworks and effective investment facilitation services, and the transparency of investment measures, such as the easy availability of laws and policies and the responsible disclosure of changes in laws and policies, help in attracting the desired investment.

While poorly-managed foreign investment can have negative impacts, sustainable investment, supported by investment facilitation for development, has the potential to promote the economic development of

cities through the development of the tourism sector while keeping social, environmental or cultural damage in check.

The role of trade in promoting sustainable cities

Sustainable cities are cities that are designed and managed to minimize negative impacts on the environment and maximize social and economic benefits for their residents.

Cities are responsible for a significant proportion of global greenhouse gas emissions, and unsustainable urban development leads to air and water pollution, deforestation and loss of biodiversity. Sustainable cities aim to reduce these negative impacts through the use of green technologies, renewable energy, waste reduction, and other sustainable practices.

Sustainable cities can also, promote social equity and inclusivity. By providing affordable housing, accessible transportation and public spaces for all residents, sustainable cities can ensure that residents have access to the resources they need to live healthy and fulfilling lives. They also prioritize social justice by addressing issues such as poverty, inequality and discrimination.

In addition, sustainable cities can be economically resilient and competitive. By promoting innovation, entrepreneurship and sustainability, sustainable cities can attract investment, create jobs and drive economic growth. They also benefit from reduced energy costs, improved public health and increased quality of life, which can make them more attractive to businesses and talent.

Sustainable tourism practices applied in sustainable cities can involve measures such as limiting the number of visitors to reduce over-tourism, promoting sustainable modes of transportation such as use of electric vehicles, bikes or scooters, supporting local businesses and involving local communities in tourism planning and decision-making.

Trade can play an important role in promoting sustainability in cities by increasing access to environmental goods and services. When cities engage in trade, they can access resources and expertise from other regions, which can help them to promote sustainable development and reduce their environmental impact.

For example, cities may trade in renewable energy resources such as wind or solar power, which can help to reduce their reliance on fossil fuels and lower their carbon footprint. Cities may also act as hubs in which sustainable goods such as organic food, eco-friendly products, or sustainably harvested timber are traded to promote sustainable consumption and production practices.

In addition, trade can help to promote innovation and technology transfer, which can support sustainable development. When cities engage in trade, they may be exposed to new ideas, technologies and practices that can help them to reduce their environmental impact and promote sustainability.

Trade can also help to support economic development and job creation in cities, which can be an important factor in promoting sustainable development. By creating economic opportunities and supporting local businesses, trade can help to reduce poverty and promote social sustainability.

International trade enables countries to access sustainable goods and environmental services that they may not have the capacity to produce themselves. This allows cities based in these countries to meet their environmental targets and reduce their carbon footprint by importing products, such as renewable energy technologies, organic food products and green building materials.

Furthermore, international trade can encourage the adoption of global environmental standards and regulations, such as the Paris Agreement,³⁰ which aims to strengthen the ability of economies to deal with the impacts of climate change and to promote development in a sustainable manner, and the Basel Convention,³¹ which aims to minimize the generation of hazardous waste and ensure its environmentally sound management. Adopting these standards can help to ensure that sustainable goods and environmental services are produced and traded responsibly.

International trade can also facilitate the exchange of best practices between cities. By engaging in trade with other sustainable cities, cities can learn from each other and adopt sustainable best practices to achieve their goals.

The WTO Trade Facilitation Agreement and sustainable cities

The WTO's Trade Facilitation Agreement (TFA) supports sustainable international trade, which in turn can help in building sustainable cities. In force since 22 February 2017, the TFA aims to expedite the movement, release and clearance of goods, including goods in transit. It also sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues, and it contains provisions for technical assistance and capacity-building in this area.³²

The TFA is a catalyst for development. Experts are of the opinion that effective implementation of the TFA has the potential to stimulate progress towards

meeting SDGs by generating employment, improving transparency and reducing the negative environmental impacts of international trade.³³ The TFA has been proven to reduce costs (Duval and Utoktham, 2022), which promotes trade competitiveness and makes trade affordable. It facilitates trade in and access to green goods and technology. It further enables development of resilient and sustainable tourism infrastructure, for instance, transport systems built with green inputs causing reduced carbon emissions. Trade facilitation ultimately results in economic resilience.³⁴ In essence, trade facilitation can be used to support sustainable tourism and the development of sustainable cities.



SDG 17: Partnerships for Trade and development

KEY POINTS

- The WTO recognizes the need for partnerships with other international organizations and development partners to improve the capacity of developing economies and least-developed countries (LDCs) to participate more fully in international trade.
- WTO representatives participated actively in the Fifth United Nations Conference on the Least Developed Countries (LDC5), which was held on 5–9 March 2023, taking part in two high-level roundtables and holding bilateral meetings with international organizations and development partners.

The WTO recognizes the need to work in partnership with other international organizations and development partners to improve the capacity of developing economies and least-developed countries (LDCs) to participate more fully in international trade.

Thus, by means of Aid for Trade, the Enhanced Integrated Framework, the Standards and Trade Development Facility and the Trade Facilitation Agreement Facility, the WTO maintains partnerships with a variety of international organizations including, but not limited to, the Codex Alimentarius Commission for food safety, the World Organisation for Animal Health (WOAH), the International Plant Protection Convention (IPPC), the United Nations Conference on Trade and Development (UNCTAD), the International Trade Centre (ITC) and UN Department of Economic and Social Affairs (UN DESA).

In 2022 and 2023, the WTO created several partnerships at the Fifth United Nations Conference on the Least Developed Countries (LDC5), with the aim of further integrating LDCs into the multilateral trading system. Over 5,000 participants, including 130 ministers and 47 heads of state/government attended LDC5. The WTO was represented by Deputy Director-General Xiangchen Zhang. The international community took stock of the implementation of the Doha Programme of Action for the Least Developed Countries for the Decade 2022-2031 (DPoA),³⁵ adopted in March 2022 during the first part of the LDC5 conference. The second part of the conference, which took place from 5 to 9 March 2023, concluded with the adoption of the Doha Political Declaration.³⁶

DDG Xiangchen Zhang participated in the UN Principals meeting, a high-level roundtable session titled “Enhancing the participation of LDCs in international trade and regional integration”, and a high-level roundtable session titled “Supporting sustainable and irreversible graduation from the least developed country category”. The WTO also organized three side events with other international organizations and held several bilateral meetings on the side-lines of LDC5, including with the OECD, UNCTAD, UN DESA, the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLS), and with UN resident coordinators in Cambodia, the European Union and Nepal.

LDC graduation is a key priority for the WTO LDC Group and therefore, WTO rules and development cooperation assist in facilitating graduating LDCs' smooth transition. In this regard, the main deliverables from LDC5 included an online university, an international investment support centre and a sustainable graduation support facility (iGRAD).³⁷ LDC development partners made several commitments to support LDCs, including commitments of US\$ 60 million by Qatar, EUR 200 million by Germany, US\$ 80 million by the Green Climate Fund and a US\$ 800 million loan package by the Kingdom of Saudi Arabia. In addition, the European Commission announced cooperation agreements with Africa amounting to EUR 130 million of investment.

References

- Ambraseys, N. and Bilham, R. (2011), "Corruption kills", *Nature* 469:153–5. Retrieved from <https://doi.org/10.1038/469153a>.
- Anderson, R. D., Kovacic, W. E. and Müller, A. C. (2016) "Promoting Competition and Deterring Corruption in Public Procurement Markets: Synergies with Trade Liberalization", E15 Expert Group on Competition Policy and the Trade System Think Piece, Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum (WEF). Retrieved from https://www.researchgate.net/publication/301683897_Promoting_Competition_and_Deterring_Corruption_in_Public_Procurement_Markets_Synergies_with_Trade_Liberalization.
- Bacchetta, M., Bekkers, E., Solleder, J.-M. and Tresa, E. (2022), "Environmental Goods Trade Liberalization: A Quantitative Modelling Study of Trade and Emission Effects", conference paper presented during the 25th Annual Conference on Global Economic Analysis (virtual conference), Geneva: World Trade Organization. Retrieved from https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6681.
- Duval, Y. and Utoktham, C. (2022), "Has the WTO trade facilitation agreement helped reduce trade costs?: an ex-post analysis", Economic and Social Commission for Asia and the Pacific (ESCAP) Working Paper no. 02, July 2022. Retrieved from <https://www.unescap.org/kp/2022/has-wto-trade-facilitation-agreement-helped-reduce-trade-costs-ex-post-analysis>.
- Food and Agriculture Organization of the United Nations (FAO) (2022), *The State of Food and Agriculture 2022*, Rome: FAO. Retrieved from <https://www.fao.org/publications/home/fao-flagship-publications/the-state-of-food-and-agriculture/2020/en>.
- Golub, S. S., Kauffmann, C. and Yeres, P. (2011), "Defining and Measuring Green FDI: An Exploratory Review of Existing Work and Evidence", OECD Working Papers on International Investment, 2011/02, Paris: OECD. Retrieved from <http://dx.doi.org/10.1787/5k-g58j1cvcvk-en>.
- International Energy Agency (IEA), International Renewable Energy Agency (IRENA) and UN Climate Change High-Level Champions (2022), *The Breakthrough Agenda Report 2022: Accelerating Sector Transitions Through Stronger International Collaboration*, Paris: IEA, IRENA and UN Climate Change High-Level Champions. Retrieved from <https://www.iea.org/reports/breakthrough-agenda-report-2022>.
- International Monetary Fund (IMF), Organisation for Economic Co-operation and Development (OECD), World Bank and World Trade Organization (WTO) (2022), *Subsidies, Trade, and International Cooperation*, Washington, D.C., Paris and Geneva: IMF, OECD, World Bank and WTO. Retrieved from https://www.wto.org/english/res_e/publications_e/sub_trade_coop_e.htm.
- International Renewable Energy Agency (IRENA) (2017), *Renewable Energy Benefits: Leveraging Local Capacity for Solar PV*, Abu Dhabi: IRENA. Retrieved from <https://www.irena.org/publications/2017/Jun/Renewable-Energy-Benefits-Leveraging-Local-Capacity-for-Solar-PV>.
- Kavlak, G., McNerney, J. and Trancik, J. E. (2018), "Evaluating the Causes of Cost Reduction in Photovoltaic Modules", *Energy Policy* 123:700-710.
- Mazzucato, M., Okonjo-Iweala, N., Rockström J. and Shanmugaratnam, T. (2023), "Turning the Tide: A Call to Collective Action", Global Commission on the Economics of Water, Paris. Retrieved from <https://watercommission.org/publication/turning-the-tide-a-call-to-collective-action/>.
- Muller, M. and Bellmann, C. (2016), "Trade and Water: How Might Trade Policy Contribute to Sustainable Water Management?", Geneva: International Centre for Trade and Sustainable Development (ICTSD). Retrieved from https://www.researchgate.net/publication/309136254_Trade_and_Water_How_Might_Trade_Policy_Contribute_to_Sustainable_Water_Management.
- Niggli, N. C. (2015), "Helping nations, businesses and people to succeed: How government procurement influences institution building, good governance, economic growth and sustainable development", *Trade, Law and Development* 7(1):8-20. Retrieved from <https://www.tradelawdevelopment.com/index.php/tld/issue/view/31>.
- Niggli, N. C. and Osei-Lah, K. (2014), "Infrastructure provision and Africa's trade and development prospects: Potential role and relevance of the WTO Agreement on Government Procurement (GPA)", WTO Working Paper ERSD-2014-20. Retrieved from https://www.wto.org/english/res_e/reser_e/ersd201420_e.htm.
- Organisation for Economic Co-operation and Development (OECD) (2021), "Managing tourism development for sustainable and inclusive recovery", OECD Tourism Papers, 2021/01, Paris: OECD. Retrieved from <https://www.oecd-ilibrary.org/docserver/b062f603-en.pdf?expires=1687788392&id=id&accname=ocid195767&checksum=2B2F887D4E76EC5CA9CB31A1D4482E78>

- Organisation for Economic Co-operation and Development (OECD) and Statistical Office of the European Communities (Eurostat) (1999), *The Environmental Goods and Services Industry: Manual for Data Collection and Analysis*, Paris: OECD. Retrieved from https://www.oecd-ilibrary.org/industry-and-services/the-environmental-goods-and-services-industry_9789264173651-en.
- Peric, J. and Niksic Radic, M. (2011), "Sustainable Foreign Direct Investment in Tourism Sector of Developing Countries". Retrieved from <https://ssrn.com/abstract=2166480>.
- Temmerman, F. (2017), *Trade in Water Under International Law: Bulk Fresh Water, Irrigation Subsidies and Virtual Water*, Cheltenham: Edward Elgar Publishing.
- Trollip, H., McCall, B. and Bataille, C. (2022), "How green primary iron production in South Africa could help global decarbonization", *Climate Policy* 22(2).
- United Nations Environment Programme (UNEP) (2021), "Driving sustainability through public procurement of infrastructure", policy brief – September 2021. Retrieved from https://www.oneplanetnetwork.org/sites/default/files/from-crm/UNEP_362_Driving_sustainability_web.pdf.
- World Intellectual Property Organization (WIPO) (2022a), *World Intellectual Property Report 2022: The direction of innovation*, Geneva: WIPO. Retrieved from <https://www.wipo.int/edocs/pubdocs/en/wipo-pub-944-2022-en-world-intellectual-property-report-2022-the-direction-of-innovation.pdf>.
- World Intellectual Property Organization (WIPO) (2022b), *Green Technology Book 2022: Solutions for climate change adaptation*, Geneva: WIPO. Retrieved from <https://www.wipo.int/edocs/pubdocs/en/wipo-pub-1080-en-green-technology-book.pdf>.
- World Tourism Organization (UNWTO) (2022), *Measuring the Sustainability of Tourism – Learning from Pilots*, Madrid: UNWTO. Retrieved from <https://www.e-unwto.org/doi/epdf/10.18111/9789284424061>.
- World Trade Organization (WTO) (2010), *World Trade Report 2010: Trade in natural resources*, Geneva: WTO. Retrieved from https://www.wto.org/english/res_e/publications_e/wtr10_e.htm.
- World Trade Organization (WTO) (2019), *World Trade Report 2019: The Future of Services Trade*, Geneva: WTO. Retrieved from https://www.wto.org/english/res_e/publications_e/wtr19_e.htm.
- World Trade Organization (WTO) (2022a), *The Crisis in Ukraine: Implications of the war for global trade and development*, Geneva: WTO. Retrieved from https://www.wto.org/english/res_e/publications_e/crisis_ukraine_e.htm.
- World Trade Organization (WTO) (2022b), *World Trade Report 2022: Climate change and international trade*, Geneva: WTO. Retrieved from https://www.wto.org/english/res_e/publications_e/wtr22_e.htm.
- World Trade Organization (WTO) (2022c), *World Tariff Profiles 2022*, Geneva: WTO. Retrieved from https://www.wto.org/english/tratop_e/tariffs_e/tariff_data_e.htm.
- World Trade Organization (WTO) (2023a), "Global Trade Outlook and Statistics", Geneva: WTO. Retrieved from https://www.wto.org/english/res_e/booksp_e/trade_outlook23_e.pdf.
- World Trade Organization (WTO) (2023b), *One year of war in Ukraine: Assessing the impact on global trade and development*, Geneva: WTO. Retrieved from https://www.wto.org/english/res_e/publications_e/oneyukr_e.htm.
- World Trade Organization (WTO) and International Renewable Energy Agency (IRENA) (2021), *Trading into a Bright Energy Future. The Case for Open, High-Quality Solar Photovoltaic Markets*, Geneva: WTO and IRENA. Retrieved from https://www.wto.org/english/res_e/publications_e/energyfuture2021_e.htm.

Endnotes

- 1 https://www.wto.org/english/news_e/news23_e/tfore_05apr23_e.htm
- 2 See <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN22/31.pdf&Open=True>.
- 3 See <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN22/30.pdf&Open=True>.
- 4 See https://www.wto.org/english/thewto_e/minist_e/mc12_e/briefing_notes_e/bftrade_and_health_e.htm.
- 5 See <https://edb.wto.org/>.
- 6 See https://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm.
- 7 See https://www.wto.org/english/tratop_e/serv_e/gatsqa_e.htm.
- 8 The global water and wastewater treatment market was valued at US\$ 281.75 billion in 2021. This market is projected to reach a value of approximately US\$ 490 billion by 2029, registering a compound annual growth rate of 7.1 per cent during the forecast period of 2022 to 2029 (see <https://www.statista.com/statistics/1199744/market-size-water-and-wastewater-treatment-global/#:~:text=The%20global%20water%20and%20wastewater,billion%20U.S.%20dollars%20in%202021>).
- 9 See <https://sdgs.un.org/conferences/water2023>.
- 10 See <https://sdgs.un.org/conferences/water2023/action-agenda>.
- 11 See <https://sdgs.un.org/conferences/water2023/events/interactive-dialogue-2>.
- 12 See <https://watercommission.org/>.
- 13 See <https://comtradeplus.un.org/>.
- 14 <https://www.waterfootprint.org/time-for-action/what-can-governments-do/>
- 15 This was one of the messages from industry executives who took part on 9 March 2023 in the first-ever WTO forum on decarbonization standards, focusing on the steel sector. For more information, see: https://www.wto.org/english/tratop_e/envir_e/trade-climate-change_info_brief_no7_e.pdf
- 16 See Valero, A. and Van Reenen, J. (2019), "The economic impact of universities: Evidence from across the globe", *Economics of Education Review* 68:53-67.
- 17 As seen on 10 July 2023 at: <https://www.wipo.int/ipadvantage/en/details.jsp?id=2645>
- 18 As seen on 10 July 2023 at: <https://www.al-monitor.com/originals/2022/03/egypt-cotton-exports-record-high-revenues-despite-russia-ukraine-war>
- 19 <https://www.wipo.int/ipadvantage/en/details.jsp?id=2629>
- 20 <https://www.wipo.int/ipadvantage/en/details.jsp?id=12635>
- 21 WTO official documents numbers IP/C/M/104/Add.1, IP/C/M/104/Rev.1 and IP/C/M104 (searchable at <https://docs.wto.org/>).
- 22 WTO official documents numbers IP/C/M/100 and IP/C/M/100/Add.1 (searchable at <https://docs.wto.org/>).
- 23 WTO official documents numbers IP/C/M/98 and IP/C/M/98/Add.1 (searchable at <https://docs.wto.org/>).
- 24 See <https://www.oecd.org/gov/public-procurement/infrastructure-energy/>.
- 25 Special Drawing Rights (SDR) – the International Monetary Fund (IMF) explains that "The SDR is an international reserve asset. The SDR is not a currency, but its value is based on a basket of five currencies—the US dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling" (<https://www.imf.org/en/About/Factsheets/Sheets/2023/special-drawing-rights-sdr>).

- 26 Corporate Subsidy Inventory 2.0, Simon J. Evenett and Fernando Martin Espejo, 11 May 2023
- 27 For more information on subsidy issues, see IMF et al. (2022).
- 28 See <https://www.unwto.org/tourism-statistics/statistical-framework-for-measuring-the-sustainability-of-tourism>.
- 29 For more information, see https://www.wto.org/english/tratop_e/invfac_public_e/invfac_e.htm.
- 30 See <https://unfccc.int/process-and-meetings/the-paris-agreement>.
- 31 See <https://www.basel.int/>.
- 32 See https://www.wto.org/english/tratop_e/tradfa_e/tradfa_introduction_e.htm.
- 33 See, for example, <https://unctad.org/news/trade-facilitation-reforms-spur-development-experts-say>.
- 34 See https://www.wto.org/english/news_e/news22_e/ddgag_01feb22_e.htm.
- 35 <https://www.un.org/ldc5/doha-programme-of-action>.
- 36 <https://www.un.org/technologybank/news/doha-political-declaration-adopted-fifth-united-nations-conference-least-developed-countries>.
- 37 <https://www.un.org/ldcportal/content/sustainable-graduation-support-facility>.



Report designed by Graphic and Event Design,
Print and Distribution Section of the World Trade Organization.

© World Trade Organization 2023



WORLD TRADE
ORGANIZATION

World Trade Organization
Centre William Rappard
Rue de Lausanne 154
CH-1211 Geneva 2
Switzerland
Tel.: +41 (0)22 739 51 11
email: enquiries@wto.org
www.wto.org

ISBN 978-92-870-7215-3



9 789287 072153