

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

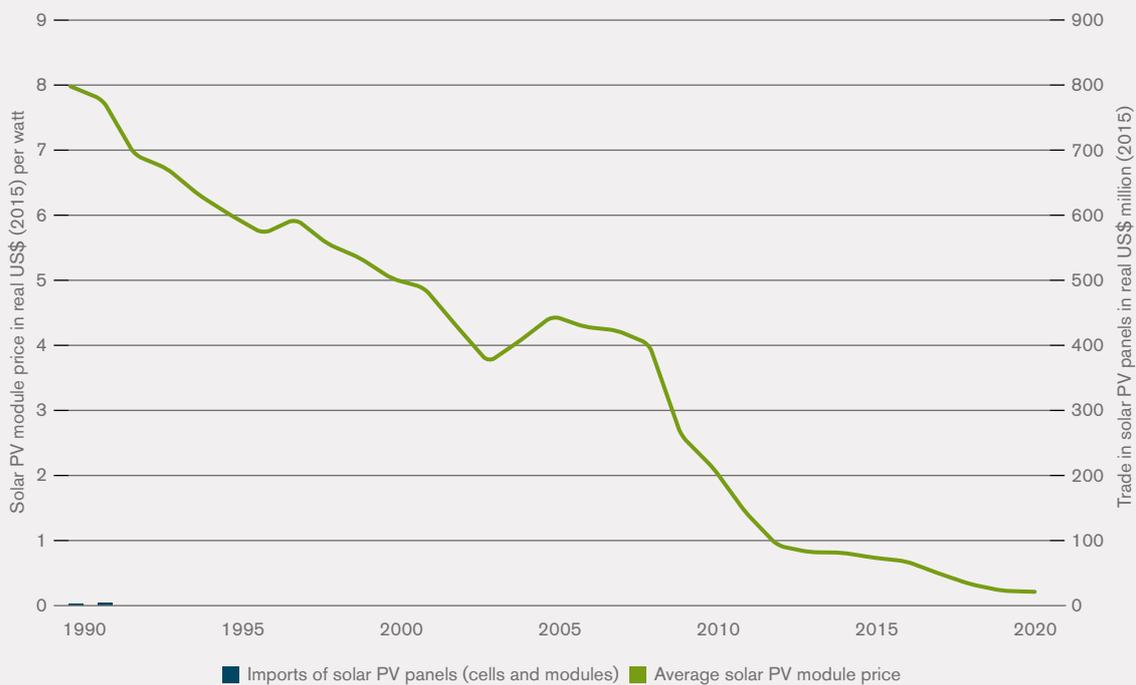
Environmental goods, services and technologies, which help to produce cleaner and renewable energy and improve energy efficiency, are critical to the transition to a low-carbon economy. Locally generated renewable energy can allow developing and least-developed economies to bypass many of the logistical 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.

